



DEPARTMENT OF THE NAVY

CRANE DIVISION  
NAVAL SURFACE WARFARE CENTER  
300 HIGHWAY 361  
CRANE, INDIANA 47522-5000

N00164.AR.000675  
NSWC CRANE  
5090.3a

IN REPLY REFER TO:

5090  
Ser 095/1324

17 OCT 1981

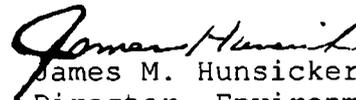
U.S. Environmental Protection Agency, Region V  
Waste, Pesticides, & Toxics Division  
Waste Management Branch  
Illinois, Indiana, and Michigan Section  
ATTN: Mr. Peter Ramanauskas (DW-8J)  
77 West Jackson Blvd.  
Chicago, IL 60604

Dear Mr. Ramanauskas:

Crane Division, Naval Surface Warfare Center (NSWC Crane) submits the Draft Interim Measures (IM) Work Plan for Solid Waste Management Unit (SWMU) 15/06 (Roads and Grounds Area). Two copies of the plan are provided as enclosure (1). The permit required Certification Statement is submitted as enclosure (2).

NSWC Crane point of contact is Mr. Thomas J. Brent, Code 09510, telephone 812-854-6160.

Sincerely,



James M. Hunsicker  
Director, Environmental  
Protection Department  
By direction of the Commander

Encl:

- (1) Draft SWMU 15/06 IM Work Plan
- (2) Certification Statement

Copy to:

ADMINISTRATIVE RECORD  
SOUTHNAVFACENGCOM (Code ES324)  
IDEM (Doug Griffin)  
TOLTEST (Peter Chevalier) (w/o encl)

I certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gather and evaluate the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations.

  
SIGNATURE

Environmental Protection Department Manager  
TITLE

10/12/01  
DATE

**DRAFT  
INTERIM MEASURES WORK PLAN**

**SWMU 15/06  
ROADS AND GROUNDS CLEANUP**

**NAVAL SURFACE WARFARE CENTER CRANE, INDIANA**

**Revision 1  
October 2001**

**CONTRACT NO. N68950-96-D-0052  
DELIVERY ORDER # FC04  
ToLTest PROJECT NO. 37827.01**

***Submitted to:***

**OFFICER IN CHARGE OF NAVFAC CONTRACTS  
NAVAL SURFACE WARFARE CENTER  
BUILDING 2516  
300 HIGHWAY 361  
CRANE, INDIANA 47522-5082**

***Submitted by:***

**ToLTest, Inc.  
1915 NORTH 12TH STREET  
P.O. BOX 2186  
TOLEDO, OHIO 43603  
(419) 241-7175**

**DRAFT  
INTERIM MEASURES WORK PLAN**

**SWMU 15/06  
ROADS AND GROUNDS CLEANUP**

**NAVAL SURFACE WARFARE CENTER CRANE, INDIANA**

**Revision 2**

**November 2001**

**CONTRACT N68950-96-D-0052  
DELIVERY ORDER #FC04  
TOLTEST PROJECT NO. 37827.01**

*Prepared by:*

**TOLTEST, INC.  
1915 NORTH 12TH STREET  
P.O. BOX 2186  
TOLEDO, OHIO 43603  
(419) 241-7175**

**PREPARED BY:**

TolTest NSWC Project Manager

  
Peter J. Chevalier 9/14/02  
(Date)

**APPROVALS:**

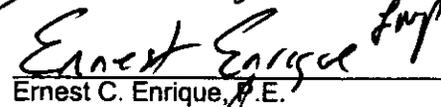
TolTest Regional Manager

  
Lance Parsons 9/9/02  
(Date)

TolTest QA/QC Manager

  
John Lytle 9/16/02  
(Date)

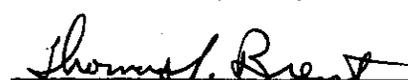
TolTest Program Manager

  
Ernest C. Enriquez, P.E. 9/10/02  
(Date)

**CLIENT ACCEPTANCE:**

U. S. Navy Responsible Authority

  
Brent Robertson (COTR) 9/23/02  
(Date)

  
Thomas Brent (ECOTR) 9/30/02  
(Date)

U.S. EPA Region V

  
Peter Ramanauskas 11/28/02  
(Date)

## TABLE OF CONTENTS

	<u>Page No.</u>
List of Acronyms .....	iii
<b>1.0 INTRODUCTION.....</b>	<b>1-1</b>
1.1 <u>Site Description</u> .....	1-1
1.2 <u>Site Physical Characteristics</u> .....	1-2
<b>2.0 CONSTRUCTION EQUIPMENT AND PERSONNEL .....</b>	<b>2-1</b>
<b>3.0 EXCAVATION SEQUENCE AND OPERATIONAL APPROACH .....</b>	<b>3-1</b>
3.1 <u>Permitting and Notification</u> .....	3-1
3.2 <u>Pre-Removal Activites</u> .....	3-1
3.3 <u>Debris Removal</u> .....	3-2
3.3.1 <u>ACM Removal</u> .....	3-2
3.4 <u>Soil Screening</u> .....	3-3
3.5 <u>Waste Management</u> .....	3-3
3.6 <u>Site Restoration</u> .....	3-4
3.7 <u>Equipment and Personnel Decontamination</u> .....	3-4
3.7.1 <u>Sampling Equipment</u> .....	3-4
3.7.2 <u>Heavy Equipment</u> .....	3-4
3.7.3 <u>Personnel</u> .....	3-5
3.8 <u>Cleanup and Emergency Response</u> .....	3-5
<b>4.0 ENVIRONMENTAL PROTECTION.....</b>	<b>4-1</b>
<b>5.0 SITE SAFETY AND HEALTH.....</b>	<b>5-1</b>
<b>6.0 REPORTING REQUIREMENTS .....</b>	<b>6-1</b>
<b>7.0 SCHEDULE.....</b>	<b>7-1</b>
<b>8.0 REFERENCES.....</b>	<b>8-1</b>

**TABLE OF CONTENTS (Continued)**

**FIGURES**

Figure 1	NSWC Crane Vicinity Map
Figure 2	Roads and Grounds Area Map
Figure 3	Project Organizational Chart

**APPENDICES**

APPENDIX A	Site Safety and Health Plan
APPENDIX B	Soil Sampling Standard Operating Procedure
APPENDIX C	Activity Hazard Analyses

## LIST OF ACRONYMS

AHA	Activity Hazard Analysis
ACM	Asbestos Containing Material
CFR	Code of Federal Regulations
COTR	Contracting Officers Technical Representative
DO	Delivery Order
ECOTR	Environmental Contracting Officer Technical Representative
EPD	Environmental Protection Department
ES	Environmental Specialist
GM	General Manager
HS	Hazardous Substance
HSO	Health and Safety Officer
IDEM	Indiana Department of Environmental Management
MS/MSD	Matrix Spikes/Matrix Spike Duplicate
MSDS	Material Safety Data Sheets
NAVFACENGCOM	Naval Facilities Engineering Command
NSWC	Naval Surface Warfare Center
OICC	Officer In-Charge of Construction
OSHA	Occupational Safety and Health Administration
PID	Photo-Ionization Detector
PM	Project Manager
PPE	Personal Protective Equipment
QA/QC	Quality Assurance/Quality Control
R&GA	Roads and Grounds Area
RACM	Regulated Asbestos Containing Material
RCI	Reactivity, Corrosivity, Ignitability
SOPs	Standard Operating Procedures
SSHPP	Site Safety and Health Plan
TCLP	Toxicity Characteristic Leaching Procedure
USDOT	United States Department of Transportation
U.S.EPA Reg. V	United States Environmental Protection Agency, Region V
VOCs	Volatile Organic Compounds
WP	Work Plan

## 1.0 INTRODUCTION

TOLTEST has been retained by the Naval Facilities Engineering Command, Officer in Charge of Construction (OICC) under contract N68950-96-D-0052, Delivery Order (DO) #FC04 to provide an Interim Measures Work Plan (WP) and Site Safety and Health Plan (SSHP) for completing remediation activities at the Roads and Grounds Area (R&GA), Naval Surface Warfare Center (NSWC) Crane, Indiana. This plan will be reviewed and approved by the Contracting Officers Technical Representative (COTR), Environmental Contracting Officer Technical Representative (ECOTR) and the United States Environmental Protection Agency Region V (U.S. EPA Reg. V), prior to the start of any work.

The primary objective of this work is to remove surface debris from the work area and implement site restoration to prevent excessive soil erosion. Potentially contaminated soil that may be encountered during the debris removal process will be contained and characterized for disposal purposes. No site characterization soil or water samples will be obtained or analyzed.

This WP is supplemented by the SSHP (Appendix A), the Soil Sampling Standard Operating Procedure (SOP, Appendix B), and the Activity Hazard Analyses (Appendix C). The WP and SSHP conform to Occupational Safety and Health Administration (OSHA) regulations identified in 29 Code of Federal Regulations (CFR) 1910.120 "Hazardous Waste Operations and Emergency Response" and applicable parts of 29 CFR 1920 and 1926. A copy of this WP will be on site during remedial activities.

Remediation activities will be conducted in accordance with U.S. EPA Reg. V, Indiana Department of Environmental Management, and United States Department of Transportation (USDOT 49CFR) regulations.

### 1.1 Site Description

NSWC Crane is located in southwestern Indiana approximately 30 miles southwest of Bloomington and occupies the northern half of Martin County and parts of Lawrence, Greene, and Davies counties (illustrated on Figure 1). NSWC provides support for equipment, shipboard weapons systems, and ordnance. In addition, NSWC supports the Crane Army Ammunition Activity including production and renovation of conventional

ammunition, storage, shipment, and demilitarization and disposal of conventional ammunition.

The R&GA is located southeast of Bldg. 3251 (Figure 2) and consists of the East and West Units. The potential for the waste from these areas to be a listed or characteristic waste is unknown.

## **1.2 Site Physical Characteristics**

Both units consist of a steep embankment leading down to a tributary of Turkey Creek. The East Unit has a vertical drop in elevation of approximately 50 feet, while the vertical drop in the West Unit is approximately 30 feet. The area is forested with scattered undergrowth that can be dense in the spring and summer months. Large and small debris, including concrete and other construction debris, steel drums, storage tanks, and an old railroad car, are strewn throughout the East Unit. The West Unit contains only small miscellaneous debris such as pipes and construction debris.

Surface soil types at the site are described in the Martin County Soil Survey<sup>1</sup> as a Wellston-Gilpin complex found on 12 to 30 percent slopes. The soil is a well drained, deep to moderately deep silt loam. No fragipan is reported in this mapping unit. According to Halliburton<sup>2</sup> no specific information on the hydrogeology of the R&GA is available due to the absence of soil borings and monitoring wells.

Surface drainage is down the slope into the tributary and then south into Turkey Creek. Regional flow of groundwater is to the southwest due to a regional dip in bedrock.

## 2.0 CONSTRUCTION EQUIPMENT AND PERSONNEL

Table 2-1 lists the equipment expected to be used and ToLTEST personnel positions assigned to this cleanup activity.

<b>Equipment</b>	<b>ToLTest Key Personnel</b>
Backhoe/Excavator	NSWC General Manager
Rubber Tire Loader	Project Manager
Dump Trucks	QA/QC Representative
Rolloff Boxes	Health and Safety Officer
Assorted hand tools	Site Supervisor
Personal Protective Equipment	Environmental Specialist
Decontamination Equipment	Operators/Drivers
Sampling Equipment	Laborer

Figure 3 provides a Project Organizational Chart illustrating how ToLTEST relates to the regulating agencies involved in this project. The agencies involved and ToLTEST's personnel positions are described below.

### NAVFACENGCOM Southern Division

Overview of project execution and coordination between ToLTEST, NSWC Crane, U.S. EPA, and other agencies.

### U.S. EPA Region V

Responsibilities include overview of all site activities to assure compliance with RCRA, and approval of all work plans and reports.

### NSWC Crane Officer In Charge of Construction (OICC)

Southern Division's on-site representative and liaison between NSWC Crane, U.S. EPA, and ToLTEST. This individual's title is Contracting Officer's Technical Representative.

### NSWC Crane Environmental Protection Department (EPD)

The EPD is responsible for monitoring ToLTEST's performance for compliance with RCRA and other pertinent environmental regulations. A representative from EPD, referred to as the Environmental Contracting Officer Technical Representative, will sign, as the generator, any manifests for waste materials requiring disposal.

### ToLTEST Crane General Manager

ToLTEST's General Manager (GM) is responsible for implementing the project and has the authority to commit the resources necessary to meet project objectives and requirements. The GM will report directly to the OICC and will provide the major point of contact and control for matters concerning contractual issues on the project.

The GM will approve all reports (deliverables) before their submission to the U.S. Navy and U.S. EPA, Reg. V, and ultimately be responsible for the preparation and quality of interim and final closure reports.

### ToLTEST Project Manager

ToLTEST's Project Manager's (PM) primary function is to ensure that technical, financial, and scheduling objectives are achieved successfully. The PM has responsibility for ensuring that the project meets objectives and ToLTEST's quality standards. The PM is the primary point of contact with the ECOTR concerning environmental issues. The PM will:

- Develop a detailed work plan schedule;
- Establish project policy and procedures to address the specific needs of the project as a whole, and the objectives of each task;
- Orient the Site Supervisor and all support staff concerning the project's special considerations;
- Monitor and direct the Site Supervisor;
- Develop and meet ongoing project and/or task staffing requirements, including mechanisms to review and evaluate each task product;
- Review the work performed on each task to ensure its quality, responsiveness, and timeliness;
- Review and analyze overall task performance with respect to planned requirements and authorizations.

### Quality Assurance/Quality Control (QA/QC) Representative

The qualifications and requirements of the QA/QC Representative are in accordance with the Department of the Navy, Naval Facilities Engineering Command, Guide Specification NFGS-01450J dated 31 March 2000.

The QA/QC Representative will implement and manage TolTest's QC program on this project. This individual will remain independent of direct job involvement and day-to-day operations and will not be on-site every day. This individual will have direct access to corporate executive staff as necessary to resolve any QA dispute and will be responsible for auditing the implementation of the QA program in conformance with this plan and TOLTEST's policies. Specific functions and duties include:

- Providing QA audits on various phases of the field operations;
- Reviewing and approving of QA plans and procedures;
- Providing QA technical assistance to project staff;
- Reporting on the adequacy, status, and effectiveness of the QA program on a regular basis to the GM and PM.

### Health and Safety Officer

The qualifications and requirements of the Health and Safety Officer (HSO) are in accordance with the Department of the Navy, Naval Facilities Engineering Command, Guide Specification NFGS-01525F dated 31 March 2000.

The HSO reports to the PM and implements and ensures compliance with the Site Safety and Health Plan (SSHP) and tracks and reports on safety related matters. The HSO or a designated representative will be on-site during all phases of work. Specific responsibilities include:

- Implements personnel surveillance program;
- Provides site-specific training as required by the SSHP;
- Conducts audits as appropriate to ensure compliance;
- Stops work when necessary to ensure the safety of personnel and to prevent damage to the environment.

### Site Supervisor

The TOLTEST Site Supervisor will be responsible for leading and coordinating the day-to-day activities of the various resource specialists under his supervision and will report directly to the PM. Specific responsibilities include:

- Provision of day-to-day coordination with the PM on technical issues in specific areas of expertise;
- Implementing field-related work plans, assurance of schedule compliance, and adherence to management-developed study requirements;
- Coordinating and managing field staff activities including sampling, excavating, and site restoration;
- Adhering to work schedules;
- Coordinating and overseeing of technical efforts of subcontractors assisting the field team;
- Identifying problems at the field team level, resolving difficulties in consultation with the PM, implementing and documenting corrective action procedures and *provisions of communication between team and upper management*;
- Documenting daily field activities for inclusion in the Contractors Production Report;
- Participating in preparation of the Closure Report.

### Environmental Specialist

The Environmental Specialist (ES) will be responsible for implementing the environmental sampling and monitoring requirements of this WP in the field to ensure that project objectives are met. Duties will include sample collection and proper shipment of samples to the laboratory. The ES will interpret and report results of analytical data to the ECOTR, GM, and PM. The ES will coordinate the proper disposal of contaminated soils (if encountered) with the PM and the ECOTR.

Operators/Drivers

Equipment operators will be responsible for proper operation and maintenance of heavy equipment utilized on the site. They will be familiar with the scope of work and will be under the direct supervision of the Site Supervisor.

Laborer

Laborers will report to the Site Supervisor and will be responsible for general site cleanup and maintenance.

### **3.0 EXCAVATION SEQUENCE AND OPERATIONAL APPROACH**

The excavation sequence and operational approach to complete the project objectives are defined in the following sections.

#### **3.1 Permitting and Notification**

The NSWC Crane facility requires issuance of permits before initiation of excavation activities. TolTest's PM will be responsible for obtaining an Excavation and Trenching Permit through the OICC, Public Works Department, Code 094, Building 2516. A Safety Permit is also required and will be secured from the Crane Army Ammunition Activity located in Building 13. An unexploded ordnance clearance will be obtained, if necessary, by the ECOTR.

#### **3.2 Pre-Removal Activities**

Once the WP and SSHP have been approved, representatives of TolTest and NSWC Crane will conduct a site walk to delineate the boundaries of the debris removal area and determine which trees will require removal. Access routes to the site, staging areas, and tree disposal areas will be finalized.

Trees within the work area that require removal will be felled and cut into lengths, and staged as directed by the Navy. An access road to the bottom of the East Unit will be cut and graded at the north end of the slope. This end of this unit is relatively free of trees and will allow easier access and cause less environmental damage to the work site than an access road at the south end of the unit. It is expected that all the debris in the West Unit can be removed from the top of the slope and therefore no access road to the bottom of the slope will be required.

The debris at the site was inspected by Mr. Shayne Newsome, an Indiana Department of Environmental Management (IDEM) licensed asbestos building inspector, license number 191224090 (expires 9/22/01), to determine if asbestos was present. Suspect asbestos containing material (ACM) was identified at both the East and the West unit in the form of corrugated transite paneling. Bulk samples were not collected and the presence of the ACM was assumed by the building inspector. Transite is considered a category II non-friable form of ACM. It is not considered a regulated asbestos containing material (RACM). Removal of this material is discussed in Section 3.3 and 3.5 of this plan.

### **3.3 Debris Removal**

Where possible (primarily in the West Unit), debris will be removed from the top of the slope using heavy equipment such as a tracked excavator. From the top of the slope, debris will either be lifted out with the bucket of the excavator or tethered and dragged out. A majority of the debris in the East Unit will have to be accessed from the bottom of the slope. Small debris can be loaded in the bucket of the heavy equipment and brought to the top of the slope. It is expected that several items, such as the storage tanks, will have to be secured with lifting devices and lifted out with the heavy equipment. The rail car may require demolition so that the pieces can be bundled and lifted out.

Soil that adheres to or is contained in the debris will be removed before the debris is removed from the site. The soil will be placed in the spot where the debris was resting.

#### **3.3.1 ACM Removal**

A ten-day notification to IDEM will not be given since it has been determined that the materials are non-friable category II (transite panels) and removal can begin without notification.

Prior to ACM removal activities, a regulated area will be established to prevent unauthorized personnel from approaching the asbestos removal activities. In order to minimize access to the area, a single entry and exit point will be established through the barrier and warning signs will be posted along the perimeter of the regulated area.

ToITest will utilize engineering controls and work practices as required by OSHA Construction Industry Asbestos Standard 29 CFR 1926.1101, Section G to minimize fiber release and sustain a non-friable state. ACM will be handled by IDEM licensed asbestos workers using the appropriate personal protective equipment (PPE) and air monitoring equipment. ACM will be removed using the wet method using amended water and double wrapped with 6 mil poly sheeting.

Decontamination procedures will include removal and double bagging of PPE. A wash station will be provided for workers to wash their hands, face, and respirator.

### **3.4 Soil Screening**

The potential exists that contaminated soil will be encountered during debris removal activities. If encountered, this soil will be segregated, containerized, and characterized for disposal purposes.

Methods used to detect or determine if soil is potentially contaminated will be evidence of soil staining (or other unusual features) and odors emanating from the soil. A handheld Photo-Ionization Detector (PID) will be used to aid in detecting odors in the soil. The PID will be used to scan the surface of the soil after debris is removed. Soil that elicits a significant response above background levels on the PID will be excavated. Soil that is contained on or in debris, such as the two above-ground storage tanks or the drums, will also be observed for signs of contamination.

Since the amount of contaminated soil to be encountered is expected to be minimal, removal of the soil will be accomplished by hand and the soil will be stored in 55 gallon steel drums. If the amount of contaminated soil appears to be a volume too significant to be contained in steel drums, a disposal container such as a rolloff box may be required to contain the soil.

### **3.5 Waste Management**

Debris that is removed from the site will be loaded onto flat bed trailers or into dump trucks and transported to the NSWC Crane Landfill for disposal unless instructed to do otherwise by the Navy. ACM will be transported to the NSWC Crane Landfill in an appropriately demarcated, enclosed, locked waste shipment container. Shipping manifests supplied by NSWC Crane will accompany all shipments to the landfill.

If a rolloff box (or similar container) is utilized to contain contaminated soil, a liner will be placed inside each container prior to being loaded. The containers will be tarped before being shipped to prevent spillage and infiltration of precipitation. Labels and placards supplied by the disposal facility, appropriate for the load being transported (either special or hazardous waste), will be affixed to each disposal container. Shipping manifests will be completed by TOLTEST and signed by the ECOTR as the generator. Shipping manifests will accompany all loads to the disposal facility. A copy of the manifests will be retained by the ECOTR and TOLTEST. Copies of all manifests and Certificates of

Disposal/Recycling completed by the disposal facility will be returned to the ECOTR within 30 days of shipment off station.

Characterization for disposal of any contaminated soil will include analysis for reactivity, ignitability, and TCLP parameters (performed on a leached extract). Sampling procedures for disposal characterization of the soil in the containers are described in the SOP, Appendix B to this plan.

### **3.6 Site Restoration**

Site restoration will include grading the work site to repair ruts caused by heavy equipment and filling and compacting areas where large pieces of debris were removed. The access road will be removed and all areas will be graded to match the existing contours. Erosion control measures will be implemented to minimize erosion from the site. These measures will consist of spreading grass seed and covering it with straw, and installing silt fences and straw bales.

### **3.7 Equipment and Personnel Decontamination**

#### **3.7.1 Sampling Equipment**

Equipment used to sample the contaminated soil in containers will be decontaminated prior to and after sampling, according to the following procedures;

- Wash in soapy water (alconox or equivalent)
- Rinse in potable water
- Rinse with 10% nitric acid
- Rinse with reagent grade water
- Air dry

The amount of water generated for sampling equipment decontamination will be kept to a minimum (2 gallons or less). Water generated in this process will be put back into the soil container and absorbed by the soil prior to disposal.

#### **3.7.2 Heavy Equipment**

Heavy equipment utilized for excavation of contaminated soil will be decontaminated prior to leaving the site. Since the amount of contamination is expected to be minimal or non-

existent, it is anticipated that only the bucket of the equipment will come into contact with the contaminated soil. If the contamination covers a large area, the equipment will be placed on a protective barrier (such as 60 mil plastic) to prevent contact of the tracks or tires with the contaminated soil.

At the conclusion of excavation activities, contaminated soil adhering to the bucket of the equipment will be scraped off and loaded into the last remaining disposal container. To remove the remaining contaminated soil, the bucket will be held over a bermed decontamination pad constructed of 6-mil plastic sheeting. A hand held pump sprayer and brushes will be used to remove the remaining soil followed by a final fine mist rinse. A minimal amount of water will be used in this process. The soil and water that has collected in the decontamination pad, and the plastic from the pad, will be placed in the disposal container. Shovels, scrapers, or other tools used to decontaminate the bucket will be cleaned in a similar manner.

### 3.7.3 Personnel

Personal protective equipment (PPE) that may be used during soil sampling and excavating activities consists of disposable clothing of Tyvek suits, over-boots, and nitrile gloves. Since this clothing is disposable, no decontamination water will be generated for personnel decontamination.

## 3.8 Cleanup and Emergency Response

Each day upon completion of work, TOLTEST will remove all excess materials and debris from the NSWC Crane property. The work areas will be left in a neat and clean condition and all materials and/or debris will be disposed of properly.

All hazardous substance (HS) releases or spills involving NSWC Crane waste or property will be immediately reported to the COTR and the ECOTR. Off-site HS releases will be immediately reported to the proper Federal, State, and Local agencies and the ECOTR. Spill cleanup, remediation and damage to the environment resulting from TOLTEST's actions will be the responsibility of TOLTEST.

#### 4.0 ENVIRONMENTAL PROTECTION

TOLTEST will provide and maintain environmental protection through the completion of this project. Environmental protection will be provided to correct conditions that develop during the project or that are required to control pollution that develops during normal work practices. TOLTEST's operations will comply with all Federal, State and Local regulations pertaining to water, air, solid waste, hazardous waste and substances, oily substances, and noise pollution.

TOLTEST will at all times be aware of and adhere to all applicable environmental laws, regulations, and environmental protection policies in effect at the NSWC Crane. Information concerning Navy environmental policies will be obtained from OPNAVINST 5090.1B and the NSWC Hazardous Waste Management Plan. TOLTEST will at all times comply with 40 CFR 262, 263, 264 and 265.

Any hazardous waste created, used, or brought onto NSWC Crane property by TOLTEST will be the responsibility of TOLTEST. Storage of hazardous waste will be in approved and properly labeled containers (49 CFR 178). The waste will be properly labeled with the proper shipping description, accumulation start date, and generator information. The containers (if any) will be removed from the project site, stored, and treated/disposed of in accordance with 40 CFR 263, 264.

All waste will be manifested from the site and will be handled through the NSWC Crane, ECOTR, who will approve and sign for all waste manifested from the site (as stated in section 3.5). Manifesting arrangements will be scheduled 24 hours in advance, excluding emergencies. After hours, weekend, and holiday, manifesting can be requested in writing 48 hours prior to shipment. NSWC Crane reserves the right to refuse all after hour, weekend, and holiday manifesting at the convenience of NSWC Crane.

TOLTEST will preserve the integrity of the natural resources of the project area. This includes returning the site to its approximate pre-construction conditions, ensuring that the surrounding area is not environmentally damaged in any way, and preventing the release of any hazardous substances into the surrounding air, land or water.

## **5.0 SITE SAFETY AND HEALTH**

Site safety and health is described in detail in the SSHP, Appendix A to this plan. In addition, activity hazard analysis (AHAs) have been prepared for each definable feature of work. The SSHO will be responsible for reviewing the AHA with the all field personnel involved in a specific task. The following describes each task/operation in terms of the definable features associated with each major phase of work. AHAs have been prepared for each major phase of work and are presented in Appendix C. Definable features of work include the following:

- a. Site Delineation
- b. Debris Removal
- c. Site Restoration
- d. Soil Sampling

## **6.0 REPORTING REQUIREMENTS**

ToLTEST will develop a detailed report containing all closure documentation including; tabulated analytical results of waste characterization samples; debris removal activities; waste disposal documentation; photographic documentation; copies of waste manifests; chain-of-custody documentation; and a discussion of all work performed. This report will be completed within 120 days after fieldwork is completed.

## **7.0 SCHEDULE**

The work schedule will be eight to ten-hour days, five to six days per week. The construction sequence will begin once approvals and all necessary permits and notifications have been received. All fieldwork will be completed within six months after date of order to proceed by the government.

The work will be conducted in such a manner as to cause the least interference with the normal functions of the site and surrounding area. Portions of the site will be vacated for periods of time as necessary for TOLTEST to perform certain work, stage equipment and materials. Prior to beginning any work, TOLTEST will meet with the ECOTR in order to approve the site requirements and sequence of work.

## 8.0 REFERENCES

1. United States Department of Agriculture, Soil Survey of Martin County, Indiana, 1988.
2. Halliburton NUS, 1992: RCRA Facility Investigation Phase I Environmental Monitoring Report SWMUs 15/06, 14/00, 16/16, Naval Surface Warfare Center, Crane Division, Crane IN.

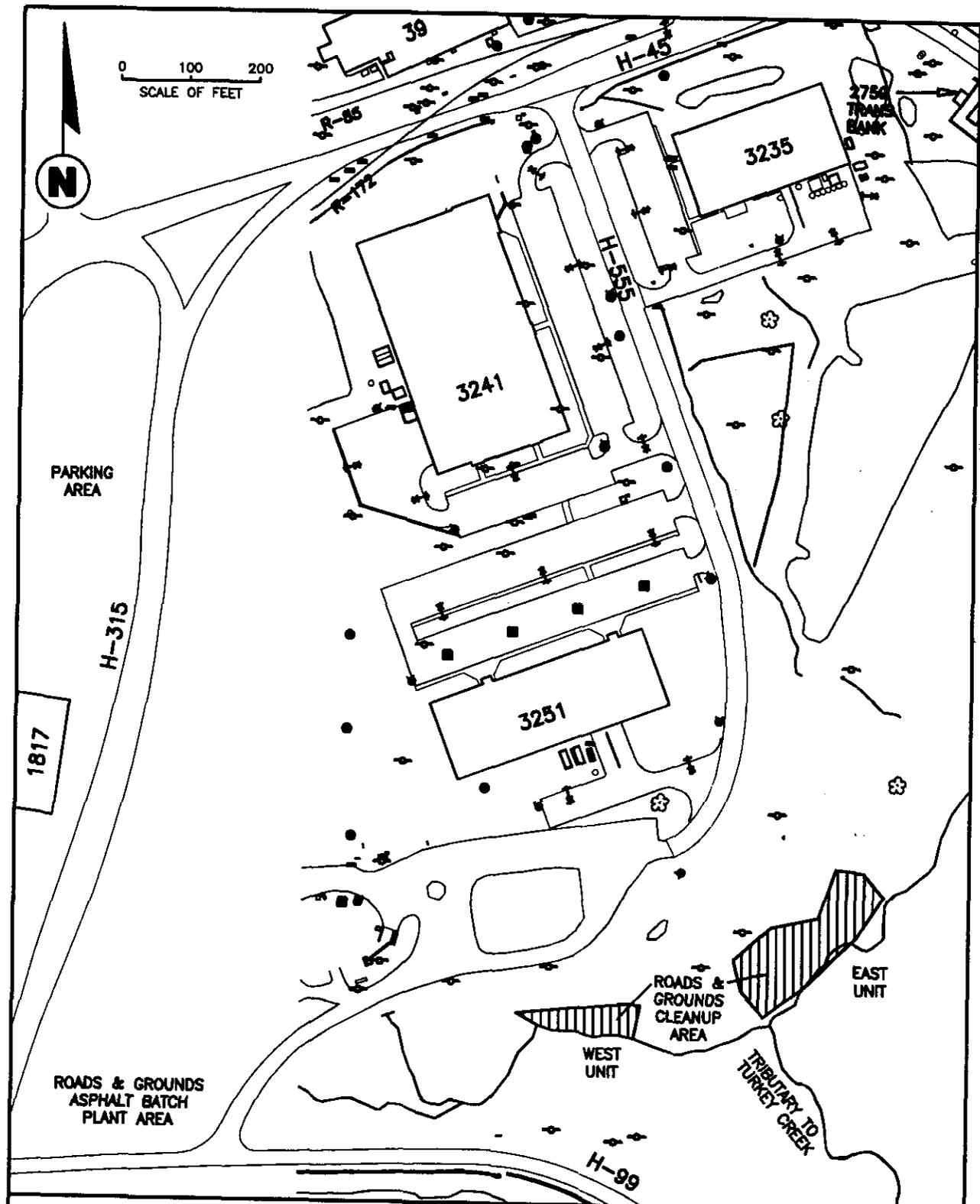
## FIGURES



FIGURE 1  
NSWC CRANE VICINITY MAP

ROADS AND GROUNDS CLEAN UP  
NAVAL SURFACE WARFARE CENTER  
CRANE, INDIANA

DRAWN MRC\5-15-00	CHECKED
REVISED	APPROVED
JOB NO. 37827.01	<b>TOLLEST, INC.</b>
DRAWING NUMBER 378271	



**FIGURE 2**  
**AREA MAP**

ROADS AND GROUNDS CLEAN UP  
NAVAL SURFACE WARFARE CENTER  
CRANE, INDIANA

DRAWN MRC\5-15-00

CHECKED

REVISED

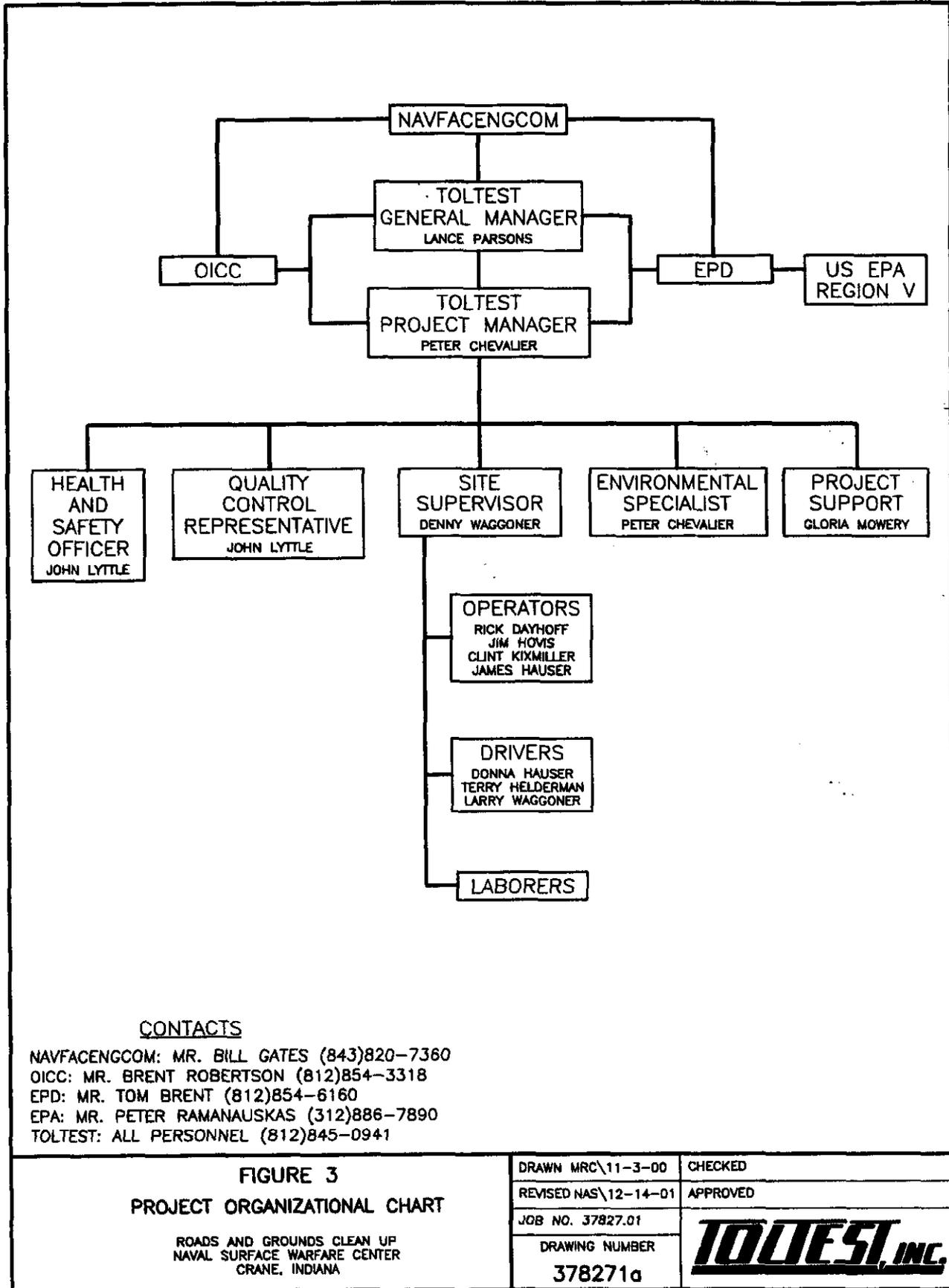
APPROVED

JOB NO. 37827.01

DRAWING NUMBER

378272a

**TOLLEST, INC.**



CONTACTS

NAVFACENGCOM: MR. BILL GATES (843)820-7360  
 OICC: MR. BRENT ROBERTSON (812)854-3318  
 EPD: MR. TOM BRENT (812)854-6160  
 EPA: MR. PETER RAMANAUSKAS (312)886-7890  
 TOLTEST: ALL PERSONNEL (812)845-0941

**FIGURE 3**  
**PROJECT ORGANIZATIONAL CHART**

ROADS AND GROUNDS CLEAN UP  
 NAVAL SURFACE WARFARE CENTER  
 CRANE, INDIANA

DRAWN MRC\11-3-00 CHECKED

REVISED NAS\12-14-01 APPROVED

JOB NO. 37827.01

DRAWING NUMBER

378271a



## **APPENDIX A**

### **SITE SAFETY AND HEALTH PLAN**

**DRAFT  
SITE SAFETY AND HEALTH PLAN**

**REVISION 0**

**SWMU SITE 15/06  
ROADS AND GROUNDS CLEANUP  
NAVAL SURFACE WARFARE CENTER CRANE, INDIANA**

**ENVIRONMENTAL JOB ORDER CONTRACT  
CONTRACT NO. N68950-96-D-0052  
DELIVERY ORDER # FC04  
TolTEST PROJECT NO. 37827.01**

*Submitted to:*

**OFFICER IN CHARGE OF NAVFAC CONTRACTS  
NAVAL SURFACE WARFARE CENTER  
BUILDING 2516  
300 HIGHWAY 361  
CRANE, INDIANA 47522-5082**

*Submitted by:*

**TolTEST, INC.  
1915 NORTH 12TH STREET  
P.O. BOX 2186  
TOLEDO, OHIO 43603  
(419) 241-7175**

**June 2001**

Approved by:

---

John Lyttle  
Crane Site Safety and Health Officer

---

Date

---

Lance Parsons  
Crane General Manager

---

Date

## TABLE OF CONTENTS

	<u>Page No.</u>
<b>1.0 INTRODUCTION</b> .....	<b>1</b>
<b>2.0 APPLICABILITY</b> .....	<b>1</b>
<b>3.0 SITE SAFETY AND HEALTH</b> .....	<b>1</b>
3.1 Key Personnel.....	1
3.2 Personal Protective Equipment.....	2
3.3 Site Control Measures.....	3
3.4 Site Standard Operating Safety Procedures.....	3
3.5 Site-Specific Respiratory Protection.....	5
3.6 Material Safety Data Sheets (MSDS).....	5
3.7 Field Training.....	5
<b>4.0 ACCIDENT PREVENTION</b> .....	<b>1</b>
4.1 Daily Safety Meetings.....	1
4.2 Daily Safety Inspections.....	1
4.3 Accident Reporting.....	1
4.4 Excavation Safety.....	1
<b>5.0 EMERGENCY RESPONSE</b> .....	<b>1</b>
5.1 Work Zones and Evacuation Procedures.....	1
5.2 Decontamination.....	1
5.3 Emergency Medical Treatment and First Aid.....	2
5.3.1 Cold Stress.....	2
5.3.2 Heat Stress.....	4
5.3.3 Flora and Fauna Hazards.....	6
5.4 Emergency Alerting and Response Procedures.....	6
5.5 Spill and Discharge Control.....	8

## ATTACHMENTS

Attachment A	Material Safety Data Sheets
Attachment B	Daily Safety Log
Attachment C	Equipment Inspection Form
Attachment D	Incident Forms
Attachment E	Directions And Maps To Area Hospitals



## **1.0 INTRODUCTION**

ToITest is responsible for the safety, health and emergency response provisions for debris removal and disposal, and site restoration at SWMU 15/06 Roads and Grounds Cleanup, Naval Surface Warfare Center (NSWC), Crane, Indiana. These provisions are provided through the development and implementation of ToITest's Corporate Health and Safety Plan and this Site Safety and Health Plan (SSHP). All personnel on site, contractors and subcontractors included, will be informed of this plan and any potential health and safety hazards of the operation. All personnel scheduled to work on this site will complete the Declaration of Understand on page ii before commencing cleanup operations.

## 2.0 APPLICABILITY

This plan will be followed during all site activities starting with site mobilization through and including site demobilization. This plan incorporates the requirements of the following regulations and/or appropriate guidance:

- Federal Acquisition Regulation (FAR) clause 52.236-13, Accident Prevention,
- Occupational Safety and Health Administration (OSHA) Construction Industry Standards, 29 CFR 1926,
- OSHA General Industry Standards, 29 CFR 1910 (including but not limited to 29 CFR 1910.120, Hazardous Waste Site Activities),
- National Institute of Occupational Safety and Health (NIOSH)/OSHA/United States Coast Guard (USCG)/Environmental Protection Agency (EPA), Occupational Safety and Health Guidance Manual for Hazardous Waste Site Activities,
- 49 CFR Part 178
- OPNAVINST 5090.1B and the base Hazardous Waste Management Plan
- Other applicable Federal, State, and local safety and health requirements.

### **3.0 SITE SAFETY AND HEALTH**

This section addresses the responsibilities for safety and health oversight, personnel protective equipment, site specific control measures, and operating procedures.

#### **3.1 Key Personnel**

The Site Safety and Health Officer (SSHO) implements and enforces the project safety program and procedures. The SSHO, or designee, will conduct the daily safety meetings and will interface as required with other site representatives. The SSHO performs duties such as confirming personnel are fit for duty, coordinating emergency medical care, conducting daily site safety inspections, and inspecting health and safety equipment. In addition, the SSHO is responsible for maintaining safety equipment, conducting and posting daily air monitoring results, conducting monitoring for thermal stress as site conditions warrant, providing site orientation safety training for all personnel actively involved in site work, and other site safety documentation. The SSHO takes the following actions when deemed appropriate.

- Orders immediate shutdown of site activities in the case of a medical emergency or unsafe practice.
- Ensures protective clothing and equipment are properly stored, used, and maintained.
- Ensures that the environmental and personnel monitoring operations are ongoing in accordance with technical specifications and required procedures.

The SSHO restricts visitors from areas of potential exposure to harmful substances. A safety log will be kept for all ToITest activities. This log will include daily safety meeting topics, training provided, air-monitoring information, visits from all outside personnel and any incidents related to health and safety.

ToITest's General Manager (GM) communicates directly with the designated Navy representative and will serve as the primary point of contact for contractual issues. The GM is responsible for determining the extent and level of input required for technical issues that arise during the tenure of the project. The SSHO ensures that all imminent danger situations, as defined by Section 13(a) of the Occupational Safety and Health Act (OSHAct), are mitigated immediately upon discovery. Serious violations of safety standards will be addressed immediately and mitigated as soon as possible. The

SSHO is responsible for reporting such imminent danger hazards and serious regulatory violations to the Corporate Safety and Health Manager.

The Site Supervisor is responsible for all field activities and enforces safe work practices by all crew members. The Site Supervisor watches for ill effects in any of the crew members, especially those symptoms potentially caused by heat stress and chemical exposure. This individual oversees the safety of any visitors who enter the site.

The GM, Project Manager, and Site Supervisor will investigate all accidents with assistance from the SSHO.

The Corporate Safety and Health Manager is responsible for the following:

- Serves as the primary contact to resolve complex health and safety matters that may arise.
- Approves new or revised written health and safety-related procedures and safe work practice instructions.
- Assists in the investigation of significant incidents.
- Conducts periodic audits for compliance with the SSHP, OSHA, and ToITest Health and Safety regulations and policies.

Although the employer is responsible for providing a safe and healthful workplace, each employee is responsible for his/her own safety as well of the safety of co-workers. The employee shall use all equipment provided in a safe and responsible manner as directed by their supervisor. Each employee is responsible for reporting any injuries, incidents, and safety infractions to their supervisor and the SSHO so treatment can be obtained and/or corrective action taken.

### **3.2 Personal Protective Equipment**

Personal protective equipment (PPE) is to be used by employees for each of the site tasks and operations being performed. The type of PPE will depend upon the level of potential exposure to hazards. During debris removal, engineering controls such as wetting the soil will be utilized in order to minimize dust. Level D PPE is anticipated to be used for this site. If unexpected conditions arise or site monitoring activities indicate

that a higher level of protection is needed, PPE will be upgraded as necessary. Level D PPE may include:

- Coveralls
- Gloves (optional)
- Boots/shoe, leather or chemical resistant, steel toe and shank
- Boots (outer), chemical resistant, disposable (optional)
- Hard hat
- Safety glasses or chemical splash goggles, impact resistant
- Hearing protection if noise level exceeds 85 dbs

### **3.3 Site Control Measures**

Control procedures will be implemented to prevent unauthorized access to the work area. This will include safety cones and caution tape or barricades around the area. At the direction of the Navy, further site controls may be required to prevent trespassers from having access to the site.

The SSHO will ensure that all personnel entering the site have the necessary training and medical approval documentation. Personnel entering the site will be given a thorough briefing on the site hazards and safe work procedures prior to proceeding. All visitors will be expected to comply with applicable federal, state and local regulatory requirements as well as the requirements of this SSHP. Visitors will also be expected to provide their own protective equipment. In the event that a visitor does not adhere to the provisions of this SSHP, they will be requested to leave the work area. All non-conformance incidents will be recorded in the daily safety log. The SSHO will document a written record of all personnel entering and exiting the site.

### **3.4 Site Standard Operating Safety Procedures**

The following safety rules shall be adhered to during all site activities:

- At least one copy of this plan will be available at the project site, in a location readily available to all personnel, including visitors.

- Personnel should practice contamination avoidance. All liquid, sludge, and soil samples will be collected in such a manner to minimize contact or exposure to the materials being sampled.
- No foods, beverages, or tobacco products shall be present or consumed in the Exclusion or Contamination Reduction Zones.
- No alcohol or drugs shall be present or consumed on site, or in any company vehicle. No personnel will be permitted to work while under the influence of alcohol or drugs while on site or operating a company vehicle.
- Emergency equipment will be located in the company vehicle in a readily accessible location. Emergency equipment will consist of fire extinguishers, first aid kit, mobile telephone, and emergency phone numbers.
- Contact shall be maintained between crew members at all times, and crew members must observe each other for signs of exposure to chemical, biological, or physical agents. Indications of adverse effects include, but are not limited to:
  - Changes in complexion and skin coloration;
  - Changes in coordination;
  - Changes in demeanor;
  - Excessive salivation and pupillary response; and
  - Changes in speech pattern.
- All personnel shall inform their partners or team members of non-visible effects of overexposure to chemical, biological, or physical agents. Symptoms of overexposure may include:
  - Headaches;
  - Dizziness;
  - Nausea;
  - Blurred vision;
  - Cramps; and
  - Irritation of the eyes, skin, or respiratory tract.

### **3.5 Site-Specific Respiratory Protection**

During this project, soil potentially impacted with various contaminants may be encountered which may pose an inhalation hazard. If this condition exists, air monitoring of the work zone may be required. Engineering controls, such as wetting the work area, will be implemented in order to reduce fugitive dust and inhalation hazards. It is anticipated that respiratory protection will not be needed. The selection of respirators as well as any decisions regarding upgrading or downgrading of respiratory protection will be made by the SSHO through consultation with the Corporate Safety and Health Manager.

### **3.6 Material Safety Data Sheets (MSDS)**

The only hazardous materials anticipated to be on site are those that will be brought to the site by ToITest: unleaded gasoline, diesel fuel, various oils, and lubricants. MSDS' for hazardous materials brought on site are included in Attachment A.

### **3.7 Field Training**

Field personnel will be required to complete the following training prior to working on this site:

- Occupational Safety and Health Administration (OSHA) 40-hour Hazardous Waste and Emergency Response Training per 29 Code of Federal Regulations (CFR) 1910.120, updated by annual 8-hour refresher training.
- OSHA 8-hour supervisor's training course in Hazardous Waste Site Safety per 29 CFR 1910.120(e) (field management personnel only).
- Site specific training.
- Respiratory training.
- Two on-site personnel will be required to have First Aid and CPR training.

Training will be verified as part of ToITest's review process.

## **4.0 ACCIDENT PREVENTION**

ToITest will implement accident prevention procedures. This section includes a description of daily safety meetings, daily safety inspections, accident reporting and excavation safety.

### **4.1 Daily Safety Meetings**

Daily safety meetings will be conducted by the SSHO or designee. These meetings will take place at the beginning of each day or if there is a change in personnel. The scope of work will be discussed along with physical and chemical hazards, protective clothing and equipment, emergency procedures, and directions to the hospital. The activity hazard analysis (AHA) associated with each major task will also be discussed. The daily safety meeting will be documented on the Daily Safety Log (Attachment B). All attendees will sign the log.

### **4.2 Daily Safety Inspections**

All machinery and equipment will be inspected and tested daily by the equipment operator to ensure a safe operating condition. Inspections will be in accordance with the manufacturer's recommendations and will be documented. Records of inspections will be maintained at the site, made available upon request, and become part of the project file. The equipment inspection form can be found in Attachment C.

### **4.3 Accident Reporting**

All reporting and record keeping requirements will be adhered to. ToITest's forms will be completed for all incidents including personal injury reports, safety incident reports, equipment damage reports, and vehicle accident reports. All reports will be submitted to the U.S. Navy's representative within 24 hours of any accident. A copy of the incident form is included in Attachment D.

### **4.4 Excavation Safety**

All excavating work will be conducted in strict conformance with (at a minimum) 29 CFR 1926.650 through 26 CFR 1926.653, including requirements for continuously sloping excavations to 1-1/2 to 1 (33°41') angle of repose. The excavated areas are anticipated

to be a depth of approximately two feet below grade and therefore the use of shoring and sheeting is not anticipated.

Notification will be made to the NSWC Crane Public Works prior to excavation activities. Utility maps of the area surrounding the site will be examined. Caution will be used during excavation as exact placements of buried services may not be known. Should undocumented utilities be encountered, the Contracting Officer Technical Representative (COTR) will be contacted immediately to facilitate relocations or possible interruptions. An unexploded ordnance clearance will be secured from the NSWC Crane Explosives Safety Officer before commencing excavation activities.

Clearances to adjacent overhead transmission and distribution electrical lines will be sufficient for the movement of vehicles and operation of construction equipment. ToITest will follow the requirements stated in OSHA 29 CFR 1926 General Construction Industry Standard and the National Electric Safety Code.

During periods when the work site is unoccupied (i.e., overnight, weekends and other similar off periods) safety cones and caution tape or barricades will be placed around the excavation site in such a manner to alert personnel to the danger and prevent them from entering the work area.

## **5.0 EMERGENCY RESPONSE**

ToITest will implement emergency response and contingency procedures in accordance with OSHA standards 29 CFR 1910.120(L). This section addresses work zones and excavation procedures, decontamination, emergency medical treatment, emergency response procedures, spill and discharge control.

### **5.1 Work Zones and Evacuation Procedures**

Daily safety meetings will identify the work zones for construction activities. The three general work zones established at the site are the exclusion zone (EZ), contamination reduction zone (CRZ), and support zone (SZ). The EZ is defined as the area where contamination is either known or likely to be present, or because of activity, will provide a potential to cause harm to personnel. Entry into the EZ requires the use of personnel protective equipment. Safety cones and caution tape or barricades will surround this zone.

The CRZ is the area where personnel conduct personal and equipment decontamination. It is essentially a buffer zone between contaminated areas and clean areas. The SZ is situated in clean areas where the chance to encounter hazardous materials or conditions is minimal. Safe distances are outside the EZ and places of refuge are outside the CRZ.

In the event of an emergency, which necessitates evacuation of the site, all personnel will be expected to leave the work zone, and mobilize at a safe distance, in an area using the designated evacuation routes. Personnel will remain at that area until the SSHO, Site Supervisor or designee provides further instructions.

### **5.2 Decontamination**

All site personnel should minimize contact with contaminants to minimize the need for extensive decontamination. The SSHO is responsible for monitoring decontamination procedures and determining their effectiveness. Non disposable PPE, sampling equipment, and heavy equipment will be decontaminated upon completion of work activities. All decontamination fluids will be containerized for disposal purposes.

### **5.3 Emergency Medical Treatment and First Aid**

All TolTest employees participate in TolTest's medical screening and surveillance programs. If an injury/illness or exposure occurs, employees must seek medical attention immediately. TolTest field personnel are trained in first aid and CPR and can administer immediate assistance.

#### **5.3.1 Cold Stress**

Cold and/or wet environmental conditions can place workers at risk of cold-related illness. Hypothermia can occur whenever temperatures are below 45° F. The principal cause of hypothermia in these conditions usually involves the loss of insulating properties of clothing due to moisture; heat loss due to increased air movement, and evaporation of moisture on the skin.

Frostbite, the other illness associated with cold exposure, is the freezing of body tissue which ranges from superficial freezing of surface skin layers to deep freezing of underlying tissue. Frostbite will only occur when the ambient temperatures are below 32° F. The risk of frostbite increases as the temperature drops and the wind speed increases.

Site workers should be protected from exposure to cold so that the core body temperature does not fall below 98.6° F. Lower body temperatures will very likely result in reduced mental alertness, reduction in rational decision making, or loss of consciousness with the threat of fatal consequences. To prevent such occurrence, the following measures may be implemented:

- Site workers should wear warm clothing, such as gloves, heavy socks, etc., when the air temperature is below 45° F. Protective clothing, such as Tyvek or other disposable overall, may be used to shield employees from the wind.
- When the air temperature is below 32° F, clothing for warmth may include:
  - Insulated suits, such as whole body thermal underwear
  - Wool socks or polypropylene socks to keep moisture off the feet
  - Insulated gloves
  - Insulated boots

- Insulated head cover such as hard hat, winter liner, or knit cap
- Insulated jacket, with wind and water resistant outer layer
- At air temperatures below 32° F, the following work practices must be implemented:
  - If the clothing of a site worker might become wet in any way on the job site, the outer layer of clothing must be water permeable
  - If a site worker's underclothing becomes wet in any way, the worker must change into dry clothing immediately. If the clothing becomes wet from sweating (and the employee is uncomfortable), the employee may finish the task at hand prior to changing into dry clothing.
  - Site workers will be provided with a warm (65° F or above) break area.
  - The intake of coffee and tea should be limited, due to their circulatory and diuretic effects.
  - The buddy system shall be practiced at all times on site. Any site worker observed with severe shivering shall leave work area immediately.
  - Site workers should dress in layers, with thinner lighter clothing worn next to the body.

**Frostbite.** To administer First Aid for frostbite, take the exposed employee indoors and rewarm the areas quickly in warm water that is between 102° and 105° F, for about 20 minutes or until the frozen tissue regains the original color. Provide warm drinks, but no coffee, tea, or alcohol. Keep the affected (frozen) tissue in warm water or covered with warm clothing for 30 minutes, even though the tissue may be very painful as it thaws. If present, do not allow blisters to be broken. Use sterile, soft dry material to cover the injured area, keep the patient warm and get medical attention.

- Do not rub the frostbitten part (this may cause gangrene).
- Do not use heat lamps or hot water bottles to warm the frostbitten areas.
- Do not place the exposed part near a hot stove.

**Hypothermia.** Hypothermia is defined as a lowering of the core body temperature. General hypothermia, the more life-threatening cold injury, affects the entire body system. Once the body temperature is lowered to 95° F, thermal

control is lost, and the body is no longer in thermal balance. A coma may occur when the core temperature reaches to below 95° F. Death can occur within two hours of the first signs and symptoms. The general symptoms of the hypothermia are usually exhibited in five stages:

- Shivering;
- Apathy, listlessness, sleepiness, and (sometimes) rapid cooling of the body;
- Unconsciousness, glassy stare, slow pulse, and respiratory rate;
- Freezing of the extremities; and
- Death.

Extremely low temperatures are not necessary to induce hypothermia—it can occur in temperatures as high as 65° F, depending on the wind chill factor. Wind increases the body's heat loss by dispersing layers of warm air trapped between layers of clothing and skin. This heat loss increases as the wind speed increases.

### 5.3.2 Heat Stress

Physical hazards may involve heat-related symptoms such as heat stress, heat cramps, heat exhaustion, or heat stroke.

Heat stress is the aggregate of environmental and physical work factors that make up the total heat load imposed on the body. The environmental factors of heat stress include air temperature, humidity, radiant heat exchange, and wind/water vapor pressure (related to humidity). Physical work contributes to the total heat stress by producing metabolic heat in the body, proportional to the intensity of the work. Heavy physical labor can greatly increase the likelihood of heat fatigue, heat exhaustion, and heat stroke, the latter being a life threatening condition. Heat stress monitoring and observation of personnel shall commence when the ambient temperature is 80° F or above (65° F, if chemical protective clothing is worn).

All employees will be informed of the possibility and symptoms of heat stress. If an employee experiences extreme fatigue, cramps, dizziness, headache, nausea, profuse sweating, or pale, clammy skin, the employee and the SSHO will take control measures.

If the symptoms do not subside after a reasonable rest period, the SSHO shall seek medical assistance.

To prevent heat stress, the following control measures will be implemented.

- Site workers will be encouraged to drink plenty of water throughout the day.
- On-site drinking water will be kept cool to encourage personnel to drink frequently.
- A work regimen that will provide adequate rest periods for cooling down will be established, as required.
- All personnel will be advised of the dangers and symptoms of heat stroke, heat exhaustion, and heat cramps.
- Employees should be instructed to observe and monitor themselves and coworkers for signs of heat stress and to take additional breaks as necessary.
- All breaks should take place in cool, well-ventilated, and shaded rest areas.

### **Heat Cramps**

Heat cramps are caused by heavy sweating and inadequate electrolyte replacement. Symptoms include muscle spasms and pain in the hands, feet or abdomen.

### **Heat Exhaustion**

Heat exhaustion occurs from increased stress on various body organs. Signs and symptoms include:

- Pale, cool, moist skin
- Heavy sweating
- Dizziness, nausea
- Fainting

### **Heat Stroke**

Heat stroke is the most serious form of heat stress and should always be treated as a medical emergency. The body's temperature regulation system fails and the body temperature rapidly rises to critical levels. Immediate action must be taken to cool the body before serious injury or death occurs. Signs and symptoms of heat stroke include:

- Red, hot, usually dry skin

- Lack of or reduced respiration
- Nausea
- Dizziness and confusion
- Strong, rapid pulse and confusion
- Coma

The differential diagnosis for heat stroke is the lack of sweating as the body's defense mechanisms for shedding excess heat fail.

### 5.3.3 Flora and Fauna Hazards

Insects, animals, and plants, which can cause an adverse health effect on workers, are a concern at this site. Stings, bites, and allergic reactions to certain plants can cause localized swelling and itching which can be treated with basic first aid practices. The SSHO should be notified if an individual has a known allergy to any specific insect or allergen. Insect repellent may be used to minimize the potential for bites and stings. In the event of an allergic reaction, proper medical attention will be sought immediately.

Bites from ticks are common to this area and precautions will be taken to identify and train workers on the signs and symptoms of Lyme disease. Warning signs for this disease are a rash that can lead into fever, headache, weakness, and joint and muscle pain similar to the flu. Workers will be trained on the proper method to remove a tick and treatment of the bite area.

Encounters with wild animals are not expected but the possibility for contact with snakes is high given the nature of the site (tall grass, woods, large rocks). Workers will be warned of this potential and appropriate precautions will be taken during sampling, clearing, and excavation activities.

### 5.4 Emergency Alerting and Response Procedures

All hazardous substance releases or spills involving Government waste or Government property, other than the original release, will be immediately reported to the US Navy. Spill cleanup and remediation and damage to the environment resulting from TolTest actions will be the responsibility of TolTest.

Below are a list of emergency numbers, emergency service organizations and directions to the nearest hospitals. A telephone is located inside the TolTest support truck.

**Emergency Telephone Numbers**

Jim Hunsicker or Tom Brent	NSWC Environmental Protection Department	(812) 854-6160
Law Enforcement	NSWC Security (Base)	812/854-3300 emergency
Fire Department	NSWC Fire Department (Base)	812/854-3300 emergency (812) 854-1235
Ambulance Service	NSWC Ambulance (Base)	812/854-3300 emergency (812) 854-1100
Eric McQueen	NSWC Safety Director	(812) 854-3601
Rich Barcum, CSP	TolTest Corp. Safety Manager	(419) 241-7175 (419) 460-7655 - cell (800) 680-1071 - pager
Poison Control Center	Poison Control Center	(800) 942-5969
National Response Center	National Response Center	(800) 424-8802
Richard Karl	Regional Chemical Accident Response National Response Team	(312) 353-9295
Medical Facility (Non-Life Threatening Injuries)	Prompt Care, Bloomington, IN	(812) 332-3443
Medical Facility (Life-Threatening Injuries ONLY)	NSWC Base Medical Facility Head Nurse (Mary Muessig)	(812) 854-1220 (812) 854-4319
Hospital	Bedford Medical Center 2900 West 16th Street Bedford, IN 47432	(812) 275-1200
Hospital	Bloomington Hospital 601 West Second Street Bloomington, IN	(812) 336-9515
Utility Locator Service	Public Works Dept.	(812) 854-1834

### **Directions to NSWC Medical Facility On-site:**

The NSWC Fire Department coordinates the on-site ambulance service. The Medical Facility is located in Building 12, off of H-2 just north of H-5. This location will be used for life threatening emergencies only.

### **Directions to Bedford Medical Center:**

From Bloomington Gate, head east on Highway 58 to the city of Bedford, then turn left onto 16th Street. Distance to hospital is approximately 20 miles.

### **Directions to Bloomington Hospital:**

Exit NSWC Crane on H5-45 through the Bloomington Gate, then follow Highway 45 North to Bloomington. At the intersection of Highway 45 and Highway 37, continue straight ahead over the bypass (Bloomfield Road), and follow Bloomfield Road until it becomes 2<sup>nd</sup> street. Continue on 2<sup>nd</sup> street and the hospital will be on right hand side of the road.

Directions and area maps to the hospitals are located in Attachment E.

## **5.5 Spill and Discharge Control**

This section provides contingency measures for potential spills and discharges from the handling and transportation of any contaminated soil, contamination fluids, and/or oil/fuel. If a spill or discharge occurs, the following actions, at a minimum, will be taken:

1. Notify the U.S. Navy representative immediately.
2. Take immediate measures to control and contain the spill within the site boundaries. This will include, at a minimum, the following actions:
  - Keep unnecessary people away, isolate hazardous areas, and deny entry.
  - Do not allow anyone to touch spilled material.
  - Stay upwind; keep out of low areas where fluids and/or vapors may accumulate.

- Keep combustibles away from the spilled material
- Use water spray or foam to reduce vapor or dust generation, as needed
- Take samples for analysis to determine that clean up is adequate
- Take other corrective measures, as needed

A written report will be submitted to the U.S. Navy within seven days of a verbal report. The SSHO will conduct spill prevention briefings daily during safety meetings for all personnel who are involved with handling, receipt, storage, and/or cleanup of oil/fuel.

**Storage** - All tanks, containers, and pumping equipment used for the storage or handling of flammable and combustible liquids will be labeled or placarded in accordance with the U.S. Department of Transportation. Oils or fuels temporarily stored will be kept in tightly sealed containers, with the exception of proper venting, in fire-resistant areas and at safe distances from ignition sources. All transfer vessels will be emptied at the end of the workday.

**Pumping Flammable and Combustible Liquids** - Flammable liquid pumping systems will be electrically bonded and grounded, and will be drawn from, or transferred into vessels, containers, or tanks through a closed piping system, from safety cans, by means of a device drawing through the top, or from a container, or portable tanks, by gravity or pump, through an approved self closing valve. Transferring by means of air pressure on the container or portable tank is prohibited.

**Equipment Inspection** - Equipment inspection is part of the daily routine during field activities. The Site Supervisor is to ensure that no oil/fuel spill has accumulated in any area by conducting daily visual inspection of the equipment. Equipment and safety issues will be documented in the daily report.

**ATTACHMENT A**

**Material Safety Data Sheets**

7100

-----  
SECTION 1 CHEMICAL PRODUCTS & COMPANY IDENTIFICATION  
-----

OCCUPATIONAL HEALTH SERVICES, INC.  
11 WEST 42ND STREET, 12TH FLOOR  
NEW YORK, NEW YORK 10036  
1-800-445-MSDS (1-800-445-6737) OR  
1-212-789-3535

FOR EMERGENCY SOURCE INFORMATION  
CONTACT: 1-615-366-2000 USA

CAS NUMBER: 68476-34-6

SUBSTANCE: DIESEL FUEL NO. 2

## TRADE NAMES/SYNONYMS:

DIESEL OIL; DIESEL FUEL; DIESEL OIL, MEDIUM; FUELS, DIESEL, NO. 2;  
DIESEL OIL NO. 2-D; DIESEL FUEL OIL NO. 2-D; DIESEL FUEL NO. 2-D;  
NO. 2 DIESEL FUEL; WINTER DIESEL; CHEVRON DIESEL FUEL NO. 2;  
ARCO DIESEL (ARCO PRODUCTS COMPANY); DIESEL FUEL #2; REGULAR DIESEL;  
FUEL OIL#2; OHS07100

## CHEMICAL FAMILY:

Petroleum hydrocarbon

CREATION DATE: 03/14/85

REVISION DATE: 01/15/94

-----  
SECTION 2 COMPOSITION/INFORMATION ON INGREDIENTS  
-----

COMPONENT : DIESEL FUEL NO. 2-D  
CAS NUMBER: 68476-34-6  
PERCENTAGE: >99

OTHER CONTAMINANTS: MAY CONTAIN TRACES OF SULFUR

-----  
SECTION 3 HAZARDS IDENTIFICATION  
-----

CERCLA RATINGS (SCALE 0-3): HEALTH=3 FIRE=2 REACTIVITY=0 PERSISTENCE=1  
NFPA RATINGS (SCALE 0-4): HEALTH=0 FIRE=2 REACTIVITY=0

## EMERGENCY OVERVIEW:

Colorless to yellow-brown liquid with a mild petroleum odor.

Suspect cancer hazard (contains material which can cause cancer in animals).  
Risk of cancer depends on duration and level of contact. Causes respiratory  
tract and skin irritation. May be irritating to eyes. May affect the central  
nervous system. May affect the kidneys. May damage the lungs. Combustible  
liquid and vapor.

Keep away from all ignition sources. Avoid breathing vapor or mist. Avoid  
contact with eyes, skin and clothing. Keep container tightly closed. Wash  
thoroughly after handling. Use only with adequate ventilation.

POTENTIAL HEALTH EFFECTS:

**INHALATION:**

**SHORT TERM EFFECTS:** May cause irritation. Additional effects may include coughing, lack of appetite, nausea, vomiting, headache, weakness, drunkenness, confusion, disorientation, restlessness, excitation, bluish skin color, unconsciousness and coma.

**LONG TERM EFFECTS:** No information available on significant adverse effects.

**SKIN CONTACT:**

**SHORT TERM EFFECTS:** May cause irritation. Additional effects may include blisters and sores.

**LONG TERM EFFECTS:** In addition to effects from short term exposure, lack of appetite and kidney damage may occur.

**EYE CONTACT:**

**SHORT TERM EFFECTS:** May cause irritation.

**LONG TERM EFFECTS:** No information available on significant adverse effects.

**INGESTION:**

**SHORT TERM EFFECTS:** May cause coughing, nausea, vomiting, diarrhea, difficulty breathing, drunkenness and lung damage.

**LONG TERM EFFECTS:** No information is available.

**ADDITIONAL DATA:** May cause cancer.

**CARCINOGEN STATUS:**

OSHA: N

NTP: N

IARC: Y

-----  
**SECTION 4****FIRST AID MEASURES**  
-----**INHALATION:**

**FIRST AID-** Remove from exposure area to fresh air immediately. If breathing has stopped, perform artificial respiration. Keep person warm and at rest. Treat symptomatically and supportively. Get medical attention immediately.

**SKIN CONTACT:**

**FIRST AID-** Remove contaminated clothing and shoes immediately. Wash affected area with soap or mild detergent and large amounts of water until no evidence of chemical remains (approximately 15-20 minutes). Get medical attention immediately.

**EYE CONTACT:**

**FIRST AID-** Wash eyes immediately with large amounts of water or normal saline, occasionally lifting upper and lower lids, until no evidence of chemical remains (approximately 15-20 minutes). Get medical attention immediately.

**INGESTION:**

**FIRST AID-** Only hydrocarbons that are solvents for a toxic agent or are themselves toxic need be evacuated. Extreme care must be used to prevent aspiration. Gastric lavage with a cuffed endotracheal tube in place to prevent further aspiration should be done within 15 minutes. In the absence of depression or convulsions or impaired gag reflex, emesis can also be induced using syrup of ipecac without increasing the hazard of aspiration. Treat symptomatically and supportively. Gastric lavage should be performed by qualified medical personnel. Get medical attention immediately.

## E TO PHYSICIAN

## ANTIDOTE:

No specific antidote. Treat symptomatically and supportively.

-----  
SECTION 5FIRE FIGHTING MEASURES  
-----

## FIRE AND EXPLOSION HAZARD:

Moderate fire hazard when exposed to heat or flame.

Vapors are heavier than air and may travel a considerable distance to a source of ignition and flash back.

Vapor-air mixtures are explosive above flash point.

## EXTINGUISHING MEDIA:

Dry chemical, carbon dioxide, water spray or regular foam  
(1990 Emergency Response Guidebook, DOT P 5800.5).

For larger fires, use water spray, fog or regular foam  
(1990 Emergency Response Guidebook, DOT P 5800.5).

## FIREFIGHTING:

Move container from fire area if you can do it without risk. Apply cooling water to sides of containers that are exposed to flames until well after fire is out. Stay away from ends of tanks. For massive fire in cargo area, use unmanned hose holder or monitor nozzles; if this is impossible, withdraw from area and let fire burn. Withdraw immediately in case of rising sound from venting safety device or any discoloration of tank due to fire. Isolate for 1/2 mile in all directions if tank, rail car or tank truck is involved in fire (1990 Emergency Response Guidebook, DOT P 5800.5, Guide Page 27).

Extinguish only if flow can be stopped; use flooding amounts of water as a fog, solid streams may be ineffective. Cool containers with flooding amounts of water, apply from as far a distance as possible. Avoid breathing vapors, keep upwind.

FLASH POINT: >125 F (>52 C)

LOWER FLAMMABLE LIMIT: 0.6%

UPPER FLAMMABLE LIMIT: 7.5%

AUTOIGNITION: >475 F (>246 C)

FLAMMABILITY CLASS (OSHA): II

## HAZARDOUS COMBUSTION PRODUCTS:

Thermal decomposition products may include toxic oxides of sulfur and carbon.

-----  
SECTION 6ACCIDENTAL RELEASE MEASURES  
-----

## OCCUPATIONAL SPILL:

Put off ignition sources. Stop leak if you can do it without risk. Use water spray to reduce vapors. For small spills, take up with sand or other absorbent material and place into containers for later disposal. For larger spills, dike

ar ahead of spill for later disposal. No smoking, flames or flares in hazard  
 ea. Keep unnecessary people away; isolate hazard area and restrict entry.

-----  
 SECTION 7

HANDLING AND STORAGE  
 -----

Observe all federal, state and local regulations when storing this substance.

Store in accordance with 29 CFR 1910.106.

Bonding and grounding: Substances with low electroconductivity, which may be ignited by electrostatic sparks, should be stored in containers which meet the bonding and grounding guidelines specified in NFPA 77-1983, Recommended Practice on Static Electricity.

Store away from incompatible substances.

-----  
 SECTION 8

EXPOSURE CONTROLS/PERSONAL PROTECTION  
 -----

EXPOSURE LIMITS:

MINERAL OIL MIST:

5 mg/m<sup>3</sup> OSHA TWA

5 mg/m<sup>3</sup> ACGIH TWA; 10 mg/m<sup>3</sup> ACGIH STEL

(Notice of Intended Changes 1993-94)

5 mg/m<sup>3</sup> NIOSH recommended TWA;

10 mg/m<sup>3</sup> NIOSH recommended STEL

Measurement method: Particulate filter;

1,1,2-trichloro-1,2,2-trifluoroethane; infrared spectrometry;

(NIOSH Vol. III # 5026).

HYDROGEN SULFIDE:

10 ppm (14 mg/m<sup>3</sup>) OSHA TWA; 15 ppm (21 mg/m<sup>3</sup>) OSHA STEL

10 ppm (14 mg/m<sup>3</sup>) ACGIH TWA; 15 ppm (21 mg/m<sup>3</sup>) ACGIH STEL

10 ppm NIOSH recommended 10 minute ceiling

10 ppm (14 mg/m<sup>3</sup>) DFG MAK TWA;

20 ppm (28 mg/m<sup>3</sup>) DFG MAK 10 minute peak, momentary value; 4 times/shift

Measurement method: Drying tube/molecular sieve tube; thermal desorption apparatus; gas chromatography with flame ionization detection; (NIOSH Vol. II(6) # 296).

500 pounds SARA Section 302 Threshold Planning Quantity

100 pounds SARA Section 304 Reportable Quantity

100 pounds CERCLA Section 103 Reportable Quantity

1500 pounds OSHA Process Safety Management Threshold Quantity

\*\*OSHA revoked the final rule limits of January 19, 1989 in response to the 11th Circuit Court of Appeals decision (AFL-CIO v. OSHA) effective June 30, 1993. See 29 CFR 1910.1000 (58 FR 35338)\*\*

VENTILATION:

Provide local exhaust ventilation to meet published exposure limits.

ventilation equipment should be explosion-proof if explosive concentrations of dust, vapor or fume are present.

**EYE PROTECTION:**

Employee must wear splash-proof or dust-resistant safety goggles to prevent eye contact with this substance.

Emergency eye wash: Where there is any possibility that an employee's eyes may be exposed to this substance, the employer should provide an eye wash fountain within the immediate work area for emergency use.

**CLOTHING:**

Wear oil impervious clothing. Avoid prolonged or repeated contact with substance. Avoid wearing oil soaked clothing.

**GLOVES:**

Employee must wear appropriate protective gloves to prevent contact with this substance.

**RESPIRATOR:**

The following respirators are recommended based on information found in the physical data, toxicity and health effects sections. They are ranked in order from minimum to maximum respiratory protection.

The specific respirator selected must be based on contamination levels found in the work place, must be based on the specific operation, must not exceed the working limits of the respirator and must be jointly approved by the National Institute for Occupational Safety and Health and the Mine Safety and Health Administration (NIOSH-MSHA).

Any type 'C' supplied-air respirator with a full facepiece operated in pressure-demand or other positive pressure mode or with a full facepiece, helmet or hood operated in continuous-flow mode.

Any self-contained breathing apparatus with a full facepiece operated in pressure-demand or other positive pressure mode.

**FOR FIREFIGHTING AND OTHER IMMEDIATELY DANGEROUS TO LIFE OR HEALTH CONDITIONS:**

Any self-contained breathing apparatus that has a full facepiece and is operated in a pressure-demand or other positive-pressure mode.

Any supplied-air respirator that has a full facepiece and is operated in a pressure-demand or other positive-pressure mode in combination with an auxiliary self-contained breathing apparatus operated in pressure-demand or other positive-pressure mode.

-----  
**SECTION 9****PHYSICAL AND CHEMICAL PROPERTIES**  
-----

DESCRIPTION: Colorless to yellow-brown liquid with a mild petroleum odor.

BOILING POINT: 350-680 F (177-360 C)

MELTING POINT: 0 F (-18 C)

VAPOR PRESSURE: 1 mmHg @ 20 C

VAPOR DENSITY: >1  
SPECIFIC GRAVITY: 0.87-0.90  
WATER SOLUBILITY: insoluble  
VISCOSITY: 32.6-40.1 SSU @ 100 F

-----  
SECTION 10STABILITY AND REACTIVITY  
-----

## REACTIVITY:

Stable under normal temperatures and pressures in a closed container.

## CONDITIONS TO AVOID:

Avoid contact with heat, sparks, flames, or other sources of ignition. Vapors may be explosive. Avoid overheating of containers; containers may violently rupture in heat of fire. Avoid contamination of water sources.

Trace amounts of hydrogen sulfide may be present in this product. There is a potential for accumulation of hydrogen sulfide in the head space of containers or in enclosed areas where the product is stored, handled or used.

## INCOMPATIBILITIES:

## DIESEL FUEL:

OXIDIZERS (STRONG): Fire and explosion hazard.

## HAZARDOUS DECOMPOSITION:

Thermal decomposition products may include toxic oxides of sulfur and carbon.

## POLYMERIZATION:

Hazardous polymerization has not been reported to occur under normal temperatures and pressures.

-----  
SECTION 11TOXICOLOGY INFORMATION  
-----

## DIESEL FUEL:

TOXICITY DATA: 7.5 gm/kg (marketplace sample) oral-rat LD50 (AETODY); >5 ml/kg (marketplace sample) skin-rabbit LD50 (AETODY).

CARCINOGEN STATUS: Human Inadequate Evidence, Animal Limited Evidence (IARC Group-2B). (See additional data)

LOCAL EFFECTS: Irritant- inhalation, skin.

ACUTE TOXICITY LEVEL: Slightly toxic by dermal absorption; relatively non-toxic by ingestion.

TARGET EFFECTS: Central nervous system depressant. Poisoning may also affect the liver and kidneys.

ADDITIONAL DATA: Animal studies have confirmed an association between the induction of cancer, primarily of the lung, and inhalation exposure to whole diesel exhaust. Limited epidemiologic evidence also suggests an association between occupational exposure to diesel engine emissions and lung cancer (NIOSH, 1988).

## HEALTH EFFECTS

## INHALATION:

## DIESEL FUEL:

IRRITANT/NARCOTIC.

**ACUTE EXPOSURE-** Vapors or mist may cause respiratory tract irritation. A human exposure has resulted in immediate cough, dyspnea, cyanosis and unconsciousness for one hour. A productive cough with sputum smelling of diesel fuel persisted for 37 days. Chest X-rays showed diffuse shadowing, most prominent at the lung bases, which resolved slowly with treatment but was still present at day 37. High levels may also cause central nervous system excitation followed by depression with symptoms possibly including restlessness, confusion, ataxia, headache, dizziness, anorexia, nausea, vomiting, weakness, incoordination, stupor, delirium and coma.

**CHRONIC EXPOSURE-** Prolonged or repeated exposure may cause irritation. One individual exposed to diesel vapors in a truck cab developed nephrotoxic effects.

**SKIN CONTACT:****DIESEL FUEL:****IRRITANT.**

**ACUTE EXPOSURE-** May cause smarting, redness and irritation. A sample of diesel fuel applied to rabbits under a patch for 24 hours caused extreme irritation with severe erythema and edema with blistering and open sores.

**CHRONIC EXPOSURE-** Repeated or prolonged contact may cause defatting and drying of the skin resulting in irritation and dermatitis. Cutaneous hyperkeratosis has been described in engine drivers with occupational exposure to diesel fuel. Two individuals with topical exposure from washing hair or hands with diesel fuel developed acute renal failure; one also had gastrointestinal symptoms. Repeated applications to rabbit skin produced 67% mortality at 8 mL/kg. The primary causes of death were depression and anorexia which were induced by dermal irritation with infection, rather than systemic intoxication. Autopsy revealed effects on the liver and kidneys.

**EYE CONTACT:****DIESEL FUEL:**

**ACUTE EXPOSURE-** Liquid or vapor may cause slight irritation, although tests with one sample of diesel fuel in rabbit eyes was non-irritating.

**CHRONIC EXPOSURE-** Repeated or prolonged exposure may cause irritation.

**INGESTION:****DIESEL FUEL:****NARCOTIC.**

**ACUTE EXPOSURE-** May cause nausea, vomiting, cramping, diarrhea, and possibly symptoms of central nervous system depression. Aspiration of even small amounts during ingestion or vomiting may result in severe pulmonary irritation with coughing, gagging, dyspnea, substernal distress, and pneumonitis, pulmonary edema and hemorrhage, and death.

**CHRONIC EXPOSURE-** No data available.

-----  
**SECTION 12****ECOLOGICAL INFORMATION**  
-----

**ENVIRONMENTAL IMPACT RATING (0-4):** no data available

**ACUTE AQUATIC TOXICITY:** no data available

**BIOGRAADABILITY:** no data available

LOG BIOCONCENTRATION FACTOR (BCF): no data available

LOG OCTANOL/WATER PARTITION COEFFICIENT: no data available

-----  
SECTION 13 DISPOSAL INFORMATION  
-----

Observe all federal, state and local regulations when disposing of this substance.

Disposal must be in accordance with standards applicable to generators of hazardous waste, 40 CFR 262. EPA Hazardous Waste Number D001.  
100 pound CERCLA Section 103 Reportable Quantity.

-----  
SECTION 14 TRANSPORTATION INFORMATION  
-----

U.S. DEPARTMENT OF TRANSPORTATION SHIPPING NAME-ID NUMBER, 49 CFR 172.101:  
Diesel fuel-NA 1993

U.S. DEPARTMENT OF TRANSPORTATION HAZARD CLASS OR DIVISION, 49 CFR 172.101:  
3 - Flammable liquid

U.S. DEPARTMENT OF TRANSPORTATION PACKING GROUP, 49 CFR 172.101:  
) III

U.S. DEPARTMENT OF TRANSPORTATION LABELING REQUIREMENTS, 49 CFR 172.101  
AND SUBPART E:  
None

U.S. DEPARTMENT OF TRANSPORTATION PACKAGING AUTHORIZATIONS:  
EXCEPTIONS: 49 CFR 173.150  
NON-BULK PACKAGING: 49 CFR 173.203  
BULK PACKAGING: 49 CFR 173.241

U.S. DEPARTMENT OF TRANSPORTATION QUANTITY LIMITATIONS 49 CFR 172.101:  
PASSENGER AIRCRAFT OR RAILCAR: 60 l  
CARGO AIRCRAFT ONLY: 220 l

-----  
SECTION 15 REGULATORY INFORMATION  
-----

TSCA STATUS: Y

CERCLA SECTION 103 (40CFR302.4):	Y	100	pounds RQ
SARA SECTION 302 (40CFR355.30):	Y	500	pounds TPQ
SARA SECTION 304 (40CFR355.40):	Y	100	pounds RQ
SARA SECTION 313 (40CFR372.65):	N		
OSHA PROCESS SAFETY (29CFR1910.119):	Y	1500	pounds TQ
CALIFORNIA PROPOSITION 65:	N		

SARA HAZARD CATEGORIES, SARA SECTIONS 311/312 (40 CFR 370.21)  
ACUTE HAZARD: Y

CHRONIC HAZARD:	Y
RE HAZARD:	Y
ACTIVITY HAZARD:	N
SUDDEN RELEASE HAZARD:	N

-----  
SECTION 16

OTHER  
-----

COPYRIGHT 1994 OCCUPATIONAL HEALTH SERVICES, INC. ALL RIGHTS RESERVED.

Licensed to: ICF KAISER INTERNATIONAL, INC & AFFILIATES  
To make unlimited paper copies for internal distribution and use only.



JOHN DEERE PRODUCT NAME: **GL5 Gear Lubricant (SAE 80W/90)**

DATA SHEET NO: 8503-40,040  
LATEST REVISION DATE: 15 Feb. 1989  
DEERE CODE: XJ  
JDM PART NO: TY6252, TY6296  
TY6382, TY6383

----- **SECTION I - PRODUCT IDENTIFICATION** -----

CHEMICAL NAME AND SYNONYMS: Lubricating Oil; Gear Oil  
CHEMICAL FAMILY: Hydrocarbon FORMULA: Complex

----- **SECTION II - HAZARDOUS INGREDIENTS** -----

<u>INGREDIENT</u>	<u>PERCENT</u>	<u>TLV/PEL</u>	<u>V.P.</u>	<u>CAS.#</u>
Solvent refined, hydro-treated residual oil	40-90	5 mg/m <sup>3</sup> *	-	64742570
Solvent refined, hydro-treated dewaxed heavy paraffinic dist.	5-30	-	-	64742650
Severly hydrotreated heavy naphthenic distillate	10-40	-	-	64742525
Polymeric additive in oil (poly-methacrylate)	10	None	-	None

\*for product

----- **SECTION III - PHYSICAL DATA** -----

BOILING POINT: > 700°F	SP. GRAVITY (WATER=1): 0.90
% VOLATILE VOLUME: N.A.	EVAPORATION RATE: N.A.
VAPOR DENSITY: N.A.	SOLUBILITY IN WATER: Insoluble
APPEARANCE/ODOR: Amber/petroleum	N.A. - not available

----- **SECTION IV - FIRE & EXPLOSION HAZARD DATA** -----

FLASH POINT: 360° F FLAMMABLE LIMIT - LEL: N/A

EXTINGUISHING MEDIA: Water fog, foam dry chemical, carbon dioxide, or halogenated agents.

SPECIAL FIRE FIGHTING PROCEDURES: Do not use a direct stream of water. Product will float and can be reignited on surface of water. Cool fire exposed containers with water. Use NIOSH approved self-contained breathing apparatus.

UNUSUAL FIRE & EXPLOSION HAZARDS: None

1340

-----  
SECTION 1 CHEMICAL PRODUCTS & COMPANY IDENTIFICATION  
-----

OCCUPATIONAL HEALTH SERVICES, INC.  
11 WEST 42ND STREET, 12TH FLOOR  
NEW YORK, NEW YORK 10036  
1-800-445-MSDS (1-800-445-6737) OR  
1-212-789-3535

FOR EMERGENCY SOURCE INFORMATION  
CONTACT: 1-615-366-2000 USA

CAS NUMBER: 8006-61-9  
RTECS NUMBER: LX3373000

SUBSTANCE: GASOLINE, AUTOMOTIVE, UNLEADED

## TRADE NAMES/SYNONYMS:

UNLEADED GASOLINE; PREMIUM UNLEADED GASOLINE; PETROL; MOTOR SPIRITS; BENZIN;  
GASOLINE; "A" GRADE GASOLINE (NCRA); "N" GRADE GASOLINE (NCRA); 420003415;  
600000024; UN 1203; STCC 4908178; OHS10340

## CHEMICAL FAMILY:

Petroleum hydrocarbon

CREATION DATE: 04/23/85

REVISION DATE: 01/15/94

-----  
SECTION 2 COMPOSITION/INFORMATION ON INGREDIENTS  
-----

COMPONENT : GASOLINE, AUTOMOTIVE, UNLEADED  
CAS NUMBER: 8006-61-9  
PERCENTAGE: 100.0  
MAY CONTAIN:  
BENZENE >0.1%  
CAS NUMBER: 71-43-2

OTHER CONTAMINANTS: NONE

-----  
SECTION 3 HAZARDS IDENTIFICATION  
-----

CERCLA RATINGS (SCALE 0-3): HEALTH=3 FIRE=3 REACTIVITY=0 PERSISTENCE=1  
NFPA RATINGS (SCALE 0-4): HEALTH=1 FIRE=3 REACTIVITY=0

## EMERGENCY OVERVIEW:

Clear colorless to amber, aromatic, volatile liquid

Cancer hazard (contains material which can cause cancer in humans). Risk of cancer depends on duration and level of exposure. Causes respiratory tract, skin and eye irritation. May cause blood disorders. May cause convulsions. May damage nerves. May affect the central nervous system. May cause adverse reproductive effects. May cause brain damage. May cause hearing loss. May affect the heart. May affect the kidneys. May affect the liver. May damage the lungs. May cause visual disturbances. Flammable liquid and vapor. May cause flash fire.

Do not breathe vapor or mist. Do not get in eyes, on skin, or on clothing. Keep away from all ignition sources. Keep container tightly closed. Wash thoroughly after handling. Use only with adequate ventilation. Handle with caution.

**POTENTIAL HEALTH EFFECTS:****INHALATION:**

**SHORT TERM EFFECTS:** May cause irritation. Additional effects may include paleness, flushing, ringing in the ears, lack of appetite, nausea, vomiting, difficulty speaking, difficulty swallowing, chest pain, difficulty breathing, irregular heartbeat, headache, weakness, drowsiness, drunkenness, feeling of well-being, confusion, disorientation, nervousness, restlessness, sleeplessness, numbness, twitching, visual disturbances, suffocation, lung damage, blood disorders, nerve effects, paralysis, convulsions, shock, unconsciousness and coma.

**LONG TERM EFFECTS:** In addition to effects from short term exposure, weight loss, low blood pressure, loss of memory, hearing loss, bruising, kidney damage, nerve damage and brain damage may occur. May also cause reproductive effects and cancer.

**SKIN CONTACT:**

**SHORT TERM EFFECTS:** May cause irritation. Additional effects may include blisters, blood in the urine, low blood pressure, lung damage and kidney damage.

**LONG TERM EFFECTS:** In addition to effects from short term exposure, burns, tingling sensation and nerve effects may occur.

**EYE CONTACT:**

**SHORT TERM EFFECTS:** May cause irritation. Additional effects may include spastic winking.

**LONG TERM EFFECTS:** In addition to effects from short term exposure, cataracts may occur.

**INGESTION:**

**SHORT TERM EFFECTS:** May cause gastrointestinal irritation. Additional effects may include coughing, paleness, flushing, fever, nausea, vomiting, diarrhea, chest pain, difficulty breathing, irregular heartbeat, headache, weakness, drunkenness, feeling of well-being, confusion, disorientation, nervousness, restlessness, excitation or drowsiness, twitching, visual disturbances, bluish skin color, suffocation, lung damage, liver damage, paralysis, convulsions, unconsciousness, coma and heart failure.

**LONG TERM EFFECTS:** In addition to effects from short term exposure, anemia and impotence may occur. May also cause reproductive effects and cancer.

**CARCINOGEN STATUS:**

OSHA: Y

NTP: Y

IARC: Y

-----  
**SECTION 4****FIRST AID MEASURES**  
-----**INHALATION:**

**FIRST AID-** Remove from exposure area to fresh air immediately. If breathing is stopped, give artificial respiration. Maintain airway and blood pressure and administer oxygen if available. Keep affected person warm and

at rest. Treat symptomatically and supportively. Administration of oxygen should be performed by qualified personnel. Get medical attention immediately.

**SKIN CONTACT:**

**FIRST AID-** Remove contaminated clothing and shoes immediately. Wash affected area with soap or mild detergent and large amounts of water until no evidence of chemical remains (approximately 15-20 minutes). Get medical attention immediately.

**EYE CONTACT:**

**FIRST AID-** Wash eyes immediately with large amounts of water or normal saline, occasionally lifting upper and lower lids, until no evidence of chemical remains (approximately 15-20 minutes). Get medical attention immediately.

**INGESTION:**

**FIRST AID-** Only hydrocarbons that are solvents for a toxic agent or are themselves toxic need to be evacuated. Extreme care must be used to prevent aspiration. Gastric lavage with a cuffed endotracheal tube in place to prevent further aspiration should be done within 15 minutes. In the absence of depression or convulsions or impaired gag reflex, emesis can also be induced using syrup of ipecac without increasing the hazard of aspiration (Dreisbach, Handbook of Poisoning, 12th Ed.). Treat symptomatically and supportively. Gastric lavage should be performed by qualified medical personnel. Get medical attention immediately.

**RE TO PHYSICIAN****ANTIDOTE:**

No specific antidote. Treat symptomatically and supportively.

-----  
**SECTION 5****FIRE FIGHTING MEASURES**  
-----**FIRE AND EXPLOSION HAZARD:**

Dangerous fire hazard when exposed to heat or flame.

Vapors are heavier than air and may travel a considerable distance to a source of ignition and flash back.

Vapor-air mixtures are explosive.

**EXTINGUISHING MEDIA:**

Dry chemical, carbon dioxide, water spray or regular foam (1990 Emergency Response Guidebook, DOT P 5800.5).

For larger fires, use water spray, fog or regular foam (1990 Emergency Response Guidebook, DOT P 5800.5).

**FIREFIGHTING:**

Move container from fire area if you can do it without risk. Apply cooling water to sides of containers that are exposed to flames until well after fire is out. Stay away from ends of tanks. For massive fire in cargo area, use unmanned hose holder or monitor nozzles; if this is impossible, withdraw from area and let fire burn. Withdraw immediately in case of rising sound from

Warning safety device or any discoloration of tank due to fire. Isolate for one mile in all directions if tank, rail car or tank truck is involved in fire (1990 Emergency Response Guidebook, DOT P 5800.5, Guide Page 27).

Extinguish only if flow can be stopped; use water in flooding amounts as fog, solid streams may spread fire. Cool containers with flooding amounts of water, apply from as far a distance as possible. Avoid breathing vapors, keep upwind. Evacuate to a radius of 1500 feet for uncontrollable fires. Consider evacuation of downwind area if material is leaking.

Water may be ineffective (NFPA 325M, Fire Hazard Properties of Flammable Liquids, Gases, and Volatile Solids, 1991)

FLASH POINT: -45 F (-43 C) (CC)  
LOWER FLAMMABLE LIMIT: 1.2%  
UPPER FLAMMABLE LIMIT: 7.6%  
AUTOIGNITION: 536-853 F (280-456 C)  
FLAMMABILITY CLASS(OSHA): IB

HAZARDOUS COMBUSTION PRODUCTS:

Thermal decomposition products may include toxic oxides of carbon.

-----  
SECTION 6

ACCIDENTAL RELEASE MEASURES  
-----

OCCUPATIONAL SPILL:

Get off ignition sources. Stop leak if you can do it without risk. Use water spray to reduce vapors. For small spills, take up with sand or other absorbent material and place into containers for later disposal. For larger spills, dike far ahead of spill for later disposal. No smoking, flames or flares in hazard area. Keep unnecessary people away; isolate hazard area and restrict entry.

Reportable Quantity (RQ):

The Superfund Amendments and Reauthorization Act (SARA) Section 304 requires that a release equal to or greater than the reportable quantity established for that substance be immediately reported to the local emergency planning committee and the state emergency response commission (40 CFR 355.40). If the release of this substance is reportable under CERCLA Section 103, the National Response Center must be notified immediately at (800) 424-8802 or (202) 426-2675 in the metropolitan Washington, D.C. area (40 CFR 302.6).

WATER SPILL:

The California Safe Drinking Water and Toxic Enforcement Act of 1986 (Proposition 65) prohibits contaminating any known source of drinking water with substances known to cause cancer and/or reproductive toxicity.

-----  
SECTION 7

HANDLING AND STORAGE  
-----

Observe all federal, state and local regulations when storing this substance.

Store in accordance with 29 CFR 1910.106.

Keep away from incompatible substances.

-----  
SECTION 8 EXPOSURE CONTROLS/PERSONAL PROTECTION  
-----

## EXPOSURE LIMITS:

## GASOLINE (BULK HANDLING):

300 ppm (900 mg/m3) OSHA TWA; 500 ppm (1,500 mg/m3) OSHA STEL  
300 ppm (900 mg/m3) ACGIH TWA; 500 ppm (1,500 mg/m3) ACGIH STEL

## BENZENE:

1 ppm OSHA TWA; 5 ppm OSHA 15 minute STEL; 0.5 ppm OSHA action level  
10 ppm (30 mg/m3) ACGIH TWA;  
ACGIH A2-Suspected Human Carcinogen  
(Notice of Intended Changes 1990-91)  
0.1 ppm (0.32 mg/m3) NIOSH recommended 8 hour TWA;  
1 ppm (3.2 mg/m3) NIOSH recommended 15 minute ceiling

Measurement method: Charcoal tube; carbon disulfide; gas chromatography with flame ionization detection; (NIOSH Vol. III # 1500, Hydrocarbons).

10 pounds CERCLA Section 103 Reportable Quantity  
Subject to SARA Section 313 Annual Toxic Chemical Release Reporting  
Subject to California Proposition 65 cancer and/or reproductive toxicity warning and release requirements- (February 27, 1987)

OSHA revoked the final rule limits of January 19, 1989 in response to the 11th Circuit Court of Appeals decision (AFL-CIO v. OSHA) effective June 30, 1993. See 29 CFR 1910.1000 (58 FR 35338)\*\*

## VENTILATION:

Provide local exhaust or general dilution ventilation to meet published exposure limits. Ventilation equipment should be explosion-proof if explosive concentrations of dust, vapor or fume are present.

## EYE PROTECTION:

Employee must wear splash-proof or dust-resistant safety goggles to prevent eye contact with this substance.

Emergency eye wash: Where there is any possibility that an employee's eyes may be exposed to this substance, the employer should provide an eye wash fountain within the immediate work area for emergency use.

## CLOTHING:

Employee must wear appropriate protective (impervious) clothing and equipment to prevent repeated or prolonged skin contact with this substance.

Any clothing wet with a flammable liquid should be immediately removed at the location where it is wetted to prevent burns from possible ignition.

## GLOVES:

Employee must wear appropriate protective gloves to prevent contact with this substance.

## RESPIRATOR:

The following respirators are recommended based on information found in the physical data, toxicity and health effects sections. They are ranked in order from minimum to maximum respiratory protection. The specific respirator selected must be based on contamination levels found in the work place, must be based on the specific operation, must not exceed the working limits of the respirator and must be jointly approved by the National Institute for Occupational Safety and Health and the Mine Safety and Health Administration (NIOSH-MSHA).

Any chemical cartridge respirator with organic vapor cartridge(s) and a full facepiece.

Any gas mask with organic vapor canister (chin-style or front- or back-mounted canister), with a full facepiece.

Any type 'C' supplied-air respirator with a full facepiece operated in pressure-demand or other positive pressure mode or with a full facepiece, helmet or hood operated in a continuous-flow mode.

Any self-contained breathing apparatus with a full facepiece operated in pressure-demand or other positive pressure mode.

FOR FIREFIGHTING AND OTHER IMMEDIATELY DANGEROUS TO LIFE OR HEALTH CONDITIONS:

Any self-contained breathing apparatus that has a full facepiece and is operated in a pressure-demand or other positive-pressure mode.

Any supplied-air respirator that has a full facepiece and is operated in a pressure-demand or other positive-pressure mode in combination with an auxiliary self-contained breathing apparatus operated in pressure-demand or other positive-pressure mode.

-----  
SECTION 9

PHYSICAL AND CHEMICAL PROPERTIES  
-----

DESCRIPTION: Clear colorless to amber, aromatic, volatile liquid

BOILING POINT: 100-400 F (38-204 C)

VAPOR DENSITY: 3.0-4.0

SPECIFIC GRAVITY: 0.7-0.8

WATER SOLUBILITY: insoluble

ODOR THRESHOLD: 0.25 ppm

SOLVENT SOLUBILITY: Absolute alcohol, ether, chloroform, benzene  
-----

SECTION 10

STABILITY AND REACTIVITY  
-----

REACTIVITY:

Stable under normal temperatures and pressures.

CONDITIONS TO AVOID:

Avoid contact with heat, sparks, flames, or other sources of ignition. Vapor may be explosive. Avoid overheating of containers; containers may violently rupture in heat of fire. Avoid contamination of water sources.

**COMPATIBILITIES:****GASOLINE, AUTOMOTIVE, UNLEADED:**

OXIDIZERS (STRONG): Fire and explosion hazard.

**HAZARDOUS DECOMPOSITION:**

Thermal decomposition products may include toxic oxides of carbon.

**POLYMERIZATION:**

Hazardous polymerization has not been reported to occur under normal temperatures and pressures.

-----  
**SECTION 11****TOXICOLOGY INFORMATION**  
-----**GASOLINE, AUTOMOTIVE, UNLEADED:**

(Data derived from unspecified and unleaded gasoline)

**IRRITATION DATA:** 500 mg/24 hours skin-rabbit mild; 500 ppm/1 hour eye-man moderate; 140 ppm/8 hours eye-human mild.**TOXICITY DATA:** 900 ppm/1 hour inhalation-man TCLo; 300 gm/m<sup>3</sup>/5 minutes inhalation-rat LC50; 300 gm/m<sup>3</sup>/5 minutes inhalation-mouse LC50; 300 gm/m<sup>3</sup>/5 minutes inhalation-guinea pig LC50; 30000 ppm/5 minutes inhalation-mammal LCLo; 18,000 mg/kg oral-rat LD50; 13.6 gm/kg oral-rat LD50 (AETODY); 53 mg/kg parenteral-man TDLo; tumorigenic data (RTECS).**CARCINOGEN STATUS:** Human Inadequate Evidence, Animal Limited Evidence (IARC Group-2B). In studies with mice and rats by inhalation, an increased incidence of hepatocellular adenomas and carcinomas was produced in female but not male mice; an increased incidence of adenomas and carcinomas of the kidney was produced in male but not female rats.**LOCAL EFFECTS:** Irritant- inhalation, skin, eye.**ACUTE TOXICITY LEVEL:** Relatively non-toxic by inhalation and ingestion.**TARGET EFFECTS:** Central nervous system depressant; simple asphyxiant.**ADDITIONAL DATA:** The use of alcoholic beverages enhances the toxic effects.

Stimulants such as epinephrine may induce ventricular fibrillation.

**BENZENE:****IRRITATION DATA:** 20 mg/24 hours skin-rabbit moderate; 15 mg/24 hours open skin-rabbit mild; 88 mg eye-rabbit moderate; 2 mg/24 hours eye-rabbit severe.**TOXICITY DATA:** 2000 ppm/5 minutes inhalation-human LCLo; 2 pph/5 minutes inhalation-human LCLo; 65 mg/m<sup>3</sup>/5 years inhalation-human LCLo; 100 ppm inhalation-human TCLo; 150 ppm/1 year intermittent inhalation-man TCLo; 20,000 ppm/5 minutes inhalation-mammal LCLo; 10,000 ppm/7 hours inhalation-rat LC50; 300 ppm/6 hours/13 weeks intermittent inhalation-rat TCLo; 9980 ppm inhalation-mouse LC50; 300 ppm/6 hours/13 weeks intermittent inhalation-mouse TCLo; 103 ppm/6 hours/5 days intermittent inhalation-mouse TCLo; 10 ppm/6 hours/10 weeks intermittent inhalation-mouse TCLo; 302 ppm/6 hours/26 weeks intermittent inhalation-mouse TCLo; 4680 ppm/8 hours/4 days intermittent inhalation-mouse TCLo; 146,000 mg/m<sup>3</sup> inhalation-dog LCLo; 170,000 mg/m<sup>3</sup> inhalation-cat LCLo; 5,000 ppm/30 minutes inhalation-rabbit LCLo; >8263 mg/kg skin-rabbit LD50; >8263 mg/kg skin-guinea pig LD50; 50 mg/kg oral-man LDLo; 930 mg/kg oral-rat LD50; 6600 mg/kg/27 weeks intermittent oral-rat TDLo; 4700 mg/kg oral-mouse LD50; 2000 mg/kg oral-dog LDLo; 88 mg/kg intravenous-rabbit LDLo;

2890 ug/kg intraperitoneal-rat LD50; 340 mg/kg intraperitoneal-mouse LD50; 27 mg/kg intraperitoneal-guinea pig LDLo; 1500 mg/kg intraperitoneal-mammal LDLo; 1400 mg/kg subcutaneous-frog LDLo; 194 mg/kg unreported-man LDLo; mutagenic data (RTECS); reproductive effects data (RTECS); tumorigenic data (RTECS).

**CARCINOGEN STATUS:** OSHA Carcinogen; Known Human Carcinogen (NTP); Human Sufficient Evidence, Animal Sufficient Evidence (IARC Group-1). Numerous case reports and series have suggested a relationship between exposure to benzene and the occurrence of various types of leukemia. Several case-control studies have also shown increased odds ratios for exposure to benzene, but mixed exposure patterns and poorly defined exposures render their interpretation difficult. Three independent cohort studies have demonstrated an increased incidence of acute nonlymphocytic leukemia in workers exposed to benzene.

**LOCAL EFFECTS:** Irritant- inhalation, skin and eye.

**ACUTE TOXICITY LEVEL:** Moderately toxic by inhalation and ingestion; slightly toxic by dermal absorption.

**TARGET EFFECTS:** Central nervous system depressant; bone marrow depressant. Poisoning may also affect the immune system and the heart.

**AT INCREASED RISK FROM EXPOSURE:** Persons with certain immunological tendencies, poor nutrition, anemia and drug or chemically induced agranulocytosis.

**ADDITIONAL DATA:** Use of alcoholic beverages may enhance the toxic effects. Use of stimulants such as epinephrine may cause cardiac arrhythmias. May cross the placenta. Interactions with medications have been reported.

#### HEALTH EFFECTS

##### INHALATION:

**GASOLINE, AUTOMOTIVE, UNLEADED:**  
IRRITANT/NARCOTIC/ASPHYXIAN/CARCINOGEN.

**ACUTE EXPOSURE-** At 160-270 ppm throat irritation may occur within several hours. At 2000 ppm mild anesthesia may occur within 30 minutes. Other symptoms of central nervous system depression may include headache, nausea, vomiting, dizziness, drowsiness, facial flushing, blurred vision, slurred speech, difficulty swallowing, staggering, confusion and euphoria. At higher levels dyspnea, pulmonary edema and bronchopneumonia may develop. Further depression may occur with weak respiration and pulse, nervousness, twitching, irritability, and ataxia. Severe intoxication may result in delirium, unconsciousness, coma, and convulsions with epileptiform seizures. The pupils may be constricted or, in comatose states, fixed and dilated or unequal; nystagmus may also occur. May also affect the liver, kidneys, spleen, brain, myocardium and pancreas. Death may be due to respiratory or circulatory failure or ventricular fibrillation. Extremely high concentration may cause asphyxiation.

**CHRONIC EXPOSURE-** With few exceptions, most of the reported effects of repeated inhalation are from intentional "sniffing" of gasoline rather than workplace exposure. Reported symptoms include headache, nausea, fatigue, anorexia and weight loss, pallor, dizziness, insomnia, memory loss, nervousness, confusion, muscular weakness and cramps, peripheral neuropathy, polyneuritis, and neurasthenia. It is unclear whether some of these symptoms may have been due to gasoline containing lead. Liver and kidney damage are also possible. In a 90 day study, male but not female rats exhibited a severe, dose-related renal toxicity. In another study, an increase in renal adenomas and carcinomas in male rats and an

increase in hepatocellular adenomas and carcinomas in female mice were reported.

**BENZENE:****IRRITANT/NARCOTIC/BONE MARROW DEPRESSANT/CARCINOGEN.**

**ACUTE EXPOSURE-** Concentrations of 3000 ppm may cause respiratory tract irritation; more severe exposures may result in pulmonary edema. Systemic effects are mainly on the central nervous system and depend on exposure time and concentration. No effects were noted at 25 ppm for 8 hours; signs of intoxication began at 50-150 ppm within 5 hours; at 500-1500 ppm, within 1 hour; were severe at 7500 ppm, within 30-60 minutes; and 20,000 ppm was fatal within 5-10 minutes. Effects may include nausea, vomiting, headache, dizziness, drowsiness, weakness, sometimes preceded by a brief period of exhilaration or euphoria, irritability, malaise, confusion, ataxia, staggering, weak, rapid pulse, chest pain and tightness with breathlessness, pallor, cyanosis of the lips and fingertips, and tinnitus. In severe exposures there may be blurred vision, shallow, rapid breathing, delirium, cardiac arrhythmias, unconsciousness, deep anesthesia, paralysis, and coma characterized by motor restlessness, tremors and hyperreflexia, sometimes preceded by convulsions. Recovery depends on the severity of exposure.

Polyneuritis may occur and there may be persistent nausea, anorexia, muscular weakness, headache, drowsiness, insomnia, and agitation. Nervous irritability, breathlessness, and unsteady gait may persist for 2-3 weeks; a peculiar skin color and cardiac distress may persist for 4 weeks. Liver and kidney effects may occur, but are usually mild, temporary impairments. Chromosomal damage has been found after exposure to toxic levels. Although generally hematotoxicity is not a significant concern in acute exposure, delayed hematological effects, including anemia and thrombocytopenia, have been reported, as have petechial hemorrhages, spontaneous internal bleeding and secondary infections. In fatal exposures, death may be due to asphyxia, central nervous system depression, cardiac or respiratory failure and circulatory collapse, or occasionally, sudden ventricular fibrillation. It may occur within a few minutes to several hours, or cardiac arrhythmia may occur at anytime within 24 hours. Also, death from central nervous system, respiratory or hemorrhagic complications may occur up to 5 days after exposure. Pathologic findings have included respiratory inflammation with edema and hemorrhage of the lungs, renal congestion, cerebral edema, and extensive petechial hemorrhages in the brain, pleurae, pericardium, urinary tract, mucous membranes, and skin.

**CHRONIC EXPOSURE-** Longterm exposure may cause symptoms referable to the central nervous, hematopoietic and immune systems. Early effects are vague and varied and may include headache, light-headedness, dizziness, nausea, anorexia, abdominal discomfort, and fatigue. Sore, dry throat, weakness, lethargy, malaise, drowsiness, nervousness, and irritability have also been reported. Later there may be dyspnea, pallor, slightly increased temperature, decreased blood pressure, rapid pulse, palpitations, and visual disturbances. Dizziness when cold water is placed in the ear and hearing impairment have been reported, as have diffuse cerebral atrophy associated with ataxia, tremors and emotional lability. Workers exposed to benzene in combination with other solvents have exhibited polyneuritis. Several case reports, one of them an acute exposure, suggest the possibility that systemic exposure may be associated with retrobulbar or optic neuritis. Occasionally hemorrhages in retina and conjunctiva

occur and rarely neuroretinal edema and papilledema have accompanied the retinal hemorrhages. Hematological effects vary widely and may appear after a few weeks or many years of exposure or even many years after exposure has ceased. The degree of exposure below which no blood effects will occur cannot be established with certainty. In the early stages, there may be blood clotting defects due to morphological, functional and quantitative platelet alteration with resultant bleeding from the nose and gums, easy bruising and petechiae; leukopenia with predominant lymphocytopenia or neutropenia; and anemia which may be normochromic or macrocytic and hypochromic. Extramedullary hematopoiesis, splenomegaly, circulating immature marrow cells, and an initial increase in leukocytes, erythrocytes and platelets have also been reported. The bone marrow may be hyper-, hypo- or normoplastic and does not always correlate with the peripheral blood picture. Also, the symptoms do not always parallel the laboratory findings. If treated at this stage, the effects appear reversible, although recovery may be protracted and there may be relapses. Decreased erythrocyte survival, hemolysis, capillary fragility, internal hemorrhages, iron metabolism disturbances, and hyperbilirubinemia have also been reported. Exposure to high levels for longer periods may result in aplasia and fatty degeneration of the bone marrow with pancytopenia. The most serious cases of aplastic anemia may be fatal due to hemorrhage and infection; death may occur within 3 months of diagnosis. Enormous variability in individual response, including non-dose dependent aplasia, and the finding of eosinophilia suggests that, in some cases, the blood dyscrasia may partially be an allergic reaction. Numerous case reports and series have suggested a relationship between exposure to benzene and the occurrence of various types of leukemia. Several case-control studies have also shown increased odds ratios for exposure to benzene, but mixed exposure patterns and poorly defined exposures render their interpretation difficult. Three independent cohort studies have demonstrated an increased incidence of acute nonlymphocytic leukemia in workers exposed to benzene. Several studies have also suggested a link between occupational exposure and multiple myeloma and lymphoma, both Hodgkin's and nonhodgkin's. Although aplastic anemia is probably the more likely consequence of longterm exposure, it is not uncommon for an individual surviving this, to go through a preleukemic phase into frank leukemia. Conversely, leukemia without precedent aplastic anemia can occur. In one study the range of time from the start of the exposure to the diagnosis of leukemia was 3-24 years. It has been suggested that the chromosomal aberrations which can arise in peripheral blood and bone marrow cells and persist for a long time after exposure ceases, may be associated with the increased incidence of leukemia. The immunosuppressive effect has also been suggested as being associated with the leukemogenesis. Adverse effects on the immunological system have been shown to make rabbits more susceptible to tuberculosis and pneumonia and may explain why the terminal event in some cases of benzene intoxication may be overwhelming infection. Exposed mice exhibited a tendency toward induction of lymphoid neoplasms. Rats exhibited an increased incidence of neoplasms, mainly carcinomas, at various sites. Menstrual disturbances have been reported more frequently in exposed women. Testicular damage has been reported in rats, rabbits and guinea pigs. Some animal studies have demonstrated embryo/fetotoxicity, sometimes at levels as low as 10 ppm and the potential for teratogenic effects such as decreased body weight and

skeletal variants, have also been shown. Other studies have not produced any abnormalities or embryoletality.

**SKIN CONTACT:**

**GASOLINE, AUTOMOTIVE, UNLEADED:  
IRRITANT.**

**ACUTE EXPOSURE-** Liquid may cause irritation with erythema and pain.

Prolonged or extensive contact may cause blistering and, in extreme cases epidermal necrolysis. A 12 year old boy partially immersed in a pool of gasoline for 1 hour experienced hypotension, abdominal tenderness, disseminated intravascular coagulation, transient hematuria, nonoliguric renal failure and an elevated serum amylase. Autopsy revealed cerebral edema, diffuse bilateral pneumonia, biventricular cardiac enlargement, toxic nephrosis, fatty infiltration of liver and peripancreatic fat necrosis.

**CHRONIC EXPOSURE-** Repeated or prolonged contact with the liquid may cause irritation, dermatitis and defatting of the skin with drying and cracking or burns and blistering. Some individuals may develop hypersensitivity, probably due to additives.

**BENZENE:**

**IRRITANT.**

**ACUTE EXPOSURE-** Direct contact may cause irritation. Effects may include erythema, a burning sensation, and with prolonged contact, blistering and edema. Under normal conditions, significant signs of systemic toxicity are unlikely from skin contact alone due to the slow rate of absorption; it may however, contribute to the toxicity from inhalation. Application to guinea pigs resulted in increased dermal permeability.

**CHRONIC EXPOSURE-** Repeated or prolonged contact defats the skin and may result in dermatitis with erythema, scaling, dryness, vesiculation, and fissuring, possibly accompanied by paresthesias of the fingers which may persist several weeks after the dermatitis subsides. Peripheral neuritis has also been reported. Secondary infections may occur. Tests on guinea pigs indicate sensitization is possible. Although animal studies have failed to establish a relationship between skin contact and a carcinogenic effect, most of the studies were inadequate; some papillomas and hematopoietic effects have been reported.

**EYE CONTACT:**

**GASOLINE, AUTOMOTIVE, UNLEADED:  
IRRITANT.**

**ACUTE EXPOSURE-** Concentrations between 270 and 900 ppm may cause a sensation of irritation often before signs such as conjunctival hyperemia are visible. Liquid splashed in the eyes may cause pain, smarting and slight, transient corneal epithelial disturbance. Blepharospasm and conjunctival hyperemia and edema may occur.

**CHRONIC EXPOSURE-** Repeated or prolonged exposure may cause conjunctivitis and possible gradual, irreversible loss of corneal and conjunctival sensitivity.

**BENZENE:**

**IRRITANT.**

**ACUTE EXPOSURE-** May cause irritation. Vapor concentrations of 3000 ppm are very irritating, even on brief exposure. Droplets cause a moderate

burning sensation, but only a slight, transient corneal epithelial injury with rapid recovery.

CHRONIC EXPOSURE- Repeated or prolonged exposure may cause conjunctivitis. 50% of rats exposed to 50 ppm for more than 600 hours developed cataracts.

INGESTION:

GASOLINE, AUTOMOTIVE, UNLEADED:

NARCOTIC.

ACUTE EXPOSURE- May cause irritation and burning of the gastrointestinal tract with nausea, vomiting and diarrhea. Absorption may cause initial central nervous stimulation followed by depression. Symptoms may include a mild excitation, restlessness, nervousness, irritability, twitching, weakness, blurred vision, headache, dizziness, drowsiness, incoordination, confusion, delirium, unconsciousness, convulsions and coma. Cardiac arrhythmias may occur. Transient liver damage is possible. Direct or indirect aspiration may cause chemical pneumonitis with pulmonary edema and hemorrhage, possibly complicated by bacterial pneumonia, and less frequently, by emphysema and pneumothorax. Signs of pulmonary involvement may include coughing, dyspnea, substernal pain, sudden development of rapid breathing, cyanosis, tachycardia and fever. Even small amounts may be fatal with death caused by cardiac arrest, asphyxia or respiratory paralysis. Depending on amount aspirated, death may occur rapidly or within 24 hours.

CHRONIC EXPOSURE- No data available.

IZENE:

ACUTE EXPOSURE- May cause local irritation and burning sensation in the mouth, throat and stomach, and hemorrhagic inflammatory lesions of the mucous membranes in contact with the liquid. Signs and symptoms of systemic intoxication may include nausea, vomiting, headache, dizziness, weakness, staggering, chest pain and tightness, shallow, rapid pulse and respiration, breathlessness, pallor followed by flushing, and a fear of impending death. There may be visual disturbances, tremors, convulsions, ventricular irregularities, and paralysis. Excitement, euphoria or delirium may precede weariness, fatigue, sleepiness and followed by stupor and unconsciousness, coma and death from respiratory failure. Those who survive the central nervous system effects may develop bronchitis, pneumonia, pulmonary edema, and intrapulmonary hemorrhage. Aspiration may cause immediate pulmonary edema and hemorrhage. The usual lethal dose in humans is 10-15 milliliters, but smaller amounts have been reported to cause death. A single exposure may produce longterm effects with pancytopenia persisting up to a year.

CHRONIC EXPOSURE- Daily administration to humans of 2-5 grams in olive oil caused headache, vertigo, bladder irritability, impotence, gastric disturbances, and evidence of renal congestion. In female rats treated with 132 single daily doses over 187 days, no effects were observed at 1 mg/kg; slight leukopenia at 10 mg/kg; and both leukopenia and anemia at 50 and 100 mg/kg. Oral administration to rats and mice at various dose levels induced neoplasms at multiple sites in males and females. In a one year gavage study, rats given 50 or 250 mg/kg, 4-5 days/week for 52 weeks did not exhibit acute or subacute toxic effects, but a dose correlated increase of leukemias and mammary carcinomas was observed; some other tumor types were also reported. Reproductive effects have been reported

in animals.

-----  
SECTION 12 ECOLOGICAL INFORMATION  
-----

ENVIRONMENTAL IMPACT RATING (0-4): no data available

ACUTE AQUATIC TOXICITY: no data available

DEGRADABILITY: no data available

LOG BIOCONCENTRATION FACTOR (BCF): no data available

LOG OCTANOL/WATER PARTITION COEFFICIENT: no data available  
-----

SECTION 13 DISPOSAL INFORMATION  
-----

Observe all federal, state and local regulations when disposing of this substance.

Disposal must be in accordance with standards applicable to generators of hazardous waste, 40 CFR 262. EPA Hazardous Waste Number D001.

100 pound CERCLA Section 103 Reportable Quantity.

Benzene - Regulatory level: 0.5 mg/l (TCLP-40 CFR 261 Appendix II)  
Materials which contain the above substance at or above the TCLP regulatory level meet the EPA toxicity characteristic, and must be disposed of in accordance with 40 CFR part 262. EPA Hazardous Waste Number D018.  
-----

SECTION 14 TRANSPORTATION INFORMATION  
-----

U.S. DEPARTMENT OF TRANSPORTATION SHIPPING NAME-ID NUMBER, 49 CFR 172.101:  
Gasoline-UN 1203

U.S. DEPARTMENT OF TRANSPORTATION HAZARD CLASS OR DIVISION, 49 CFR 172.101:  
3 - Flammable liquid

U.S. DEPARTMENT OF TRANSPORTATION PACKING GROUP, 49 CFR 172.101:  
PG II

U.S. DEPARTMENT OF TRANSPORTATION LABELING REQUIREMENTS, 49 CFR 172.101  
AND SUBPART E:  
Flammable liquid

U.S. DEPARTMENT OF TRANSPORTATION PACKAGING AUTHORIZATIONS:  
EXCEPTIONS: 49 CFR 173.150  
NON-BULK PACKAGING: 49 CFR 173.202  
BULK PACKAGING: 49 CFR 173.242

U.S. DEPARTMENT OF TRANSPORTATION QUANTITY LIMITATIONS 49 CFR 172.101:  
PASSENGER AIRCRAFT OR RAILCAR: 5 l  
Cargo AIRCRAFT ONLY: 60 l

## SECTION 15

## REGULATORY INFORMATION

TSCA STATUS: Y

CERCLA SECTION 103 (40CFR302.4):	Y	10 pounds RQ
SARA SECTION 302 (40CFR355.30):	N	
SARA SECTION 304 (40CFR355.40):	N	
SARA SECTION 313 (40CFR372.65):	Y	
OSHA PROCESS SAFETY (29CFR1910.119):	N	
CALIFORNIA PROPOSITION 65:	Y	

SARA HAZARD CATEGORIES, SARA SECTIONS 311/312 (40 CFR 370.21)

ACUTE HAZARD:	Y
CHRONIC HAZARD:	Y
FIRE HAZARD:	Y
REACTIVITY HAZARD:	N
SUDDEN RELEASE HAZARD:	N

## SECTION 16

## OTHER

COPYRIGHT 1994 OCCUPATIONAL HEALTH SERVICES, INC. ALL RIGHTS RESERVED.

Licensed to: ICF KAISER INTERNATIONAL, INC &amp; AFFILIATES

To make unlimited paper copies for internal distribution and use only.

# MATERIAL SAFETY DATA SHEET

Date Issued: 02/13/96

## SECTION A - IDENTIFICATION & EMERGENCY INFORMATION

Manufacturer's Name: Dryden Oil Company, Inc.  
Emergency Telephone Number: 410-574-5000  
800-777-1466

Address: 9300 Pulaski Highway  
Baltimore, MD 21220

**PRODUCT NAME:** Drydene H. D. Lithium E. P. Grease O. 1 and 2

**Chemical Name:** Petroleum Oil (Grease)

**Product Appearance & Odor:** Brown Semi-Solid  
Bland Odor

**CAS Number (For Finished Product):**  
COMPLEX MIXTURE  
CAS Number Not Applicable

### HAZARDOUS MATERIALS IDENTIFICATION SYSTEM (HMIS)

Health - 1 Flammability - 1 Reactivity - 0

Hazard Rating: Least-0 Slight-1 Moderate-2 High-3 Extreme-4

## SECTION B - COMPONENTS & HAZARD INFORMATION

<u>COMPONENTS</u>	<u>CAS NO. OF COMPONENTS</u>	<u>APPROXIMATE CONCENTRATION</u>
Lubricating Oil Base Stock	64742-65-0	Greater than 85%
Proprietary Additives	Mixture	Less than 15%

Exposure Limit for Total Product: 5mg/m<sup>3</sup> oil mist for an 8-hour work day. Basis: OSHA Reg 29 CFR 1910.1000  
CERCLA Hazardous Substances: None known. If this product is accidentally spilled, it is not subject to any special reporting under the requirements of the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA). We recommend you contact local authorities to determine if there may be other local reporting requirements. US TSCA Inventory: All components of this material are on the US TSCA Inventory. Threshold Planning Quantity (TPQ), EPA Regulation 40 CFR 355 Extremely Hazardous Substances (SARA Sections 301-304): None. Toxic Chemical Release Reporting, EPA Regulation 40 CFR 372 (SARA Section 313):  
Zinc Alkyldithiophosphate CAS 68649-42-3 1% max

## SECTION C - PHYSICAL DATA (The following data are approximate or typical values.)

Boiling Range: Not Determined  
Percent Volatile by Volume: NEGLIGIBLE

Specific Gravity (H<sub>2</sub>O=1): 0.871. 90 @ 16. C  
Vapor Pressure: NEGLIGIBLE

Pour Point: Freezing Point 0. F  
Vapor Density: GREATER THAN AIR

Viscosity: N/A  
Evaporation Rate: NEGLIGIBLE

Solubility in Water: Negligible. Below 0. 1%

## SECTION D - FIRE PROTECTION INFORMATION

FLASH POINT & METHOD: Min. ASTM D-92 C.O.C. °C, (°F.)  
400. F

AUTOIGNITION TEMPERATURE:  
NOT DETERMINED

NATIONAL FIRE  
PROTECTION ASSOCIATION  
(NFPA)-Hazard Identification  
Health - 1

Flammability - 1  
Reactivity - 0

Basis: Recommended by Dryden Oil Co.

Hazard Rating (NFPA):  
4-Extreme 3-High 2-Moderate  
1-Slight 0-Insignificant

UNUSUAL FIRE & EXPLOSION HAZARDS:  
None

Flammability Limits (% by volume in air):  
Lower: Not determined Upper: Not determined

137 (01)

## SECTION D - FIRE PROTECTION INFORMATION (Continued)

**HANDLING PRECAUTIONS:** Use product with caution around heat, sparks, pilot lights, static electricity and open flame.

**DECOMPOSITION PRODUCTS UNDER FIRE CONDITIONS:** Fumes, smoke, carbon monoxide, sulfur oxides, and other decomposition products, in the case of incomplete combustion.

**EXTINGUISHING MEDIA & FIRE FIGHTING PROCEDURES:** Foam, water spray (fog), dry chemical, carbon dioxide and vaporizing liquid type extinguishing agents may all be suitable for extinguishing fires involving this type of product, depending on the size or potential size of fire and circumstances related to the situation. Plan fire protection and response strategy through consultation with local fire protection authorities or appropriate specialists.

The following procedures for this type of product are based on the recommendations in the National Fire Protection Association's *Fire Protection Guide on Hazardous Materials*. Use water spray, dry chemical, foam, or carbon dioxide to extinguish the fire. Water or

foam may cause frothing. Use water to keep fire-exposed containers cool. Water spray may be used to flush spills away from exposures. Minimize breathing of gases, vapor, fumes or decomposition products. Use supplied-air breathing equipment for enclosed or confined spaces or as otherwise needed.

**EMPTY CONTAINER WARNING:** "Empty" containers retain residue (liquid and/or vapor) and can be dangerous. DO NOT PRESSURIZE, CUT, WELD, BRAZE, BENDER, DRILL, GRIND OR EXPOSE SUCH CONTAINERS TO HEAT, FLAME, SPARKS OR OTHER SOURCES OF IONITION: THEY MAY EXPLODE AND CAUSE INJURY OR DEATH. Do not attempt to clean since residue is difficult to remove. "Empty" drums should be completely drained, properly bunged and promptly returned to a drum reconditioner. All other containers should be disposed of in an environmentally safe manner and in accordance with governmental regulations.

## SECTION E - PROTECTION & PRECAUTIONS

**VENTILATION:** Use local exhaust to capture vapor, mist or fumes, if necessary. Provide ventilation sufficient to prevent exceeding recommended exposure limit or buildup of explosive concentrations of vapor in air. No smoking, flame or other ignition sources.

**RESPIRATORY PROTECTION:** Use supplied-air respiratory protection in confined or enclosed spaces, if needed.

**PROTECTIVE GLOVES:** Use chemical-resistant gloves, if needed, to avoid prolonged or repeated skin contact.

**EYE PROTECTION:** Use splash goggles or face shield when eye contact may occur.

**OTHER PROTECTIVE EQUIPMENT:** Use chemical-resistant apron or other impervious clothing, if needed, to avoid contaminating regular clothing, which could result in prolonged or repeated skin contact.

**WORK PRACTICES/ENGINEERING CONTROLS:** Keep

containers closed when not in use. Do not store near heat, sparks, flame or strong oxidants. In order to prevent fire or explosion hazards, see appropriate equipment.

**PERSONAL HYGIENE:** Minimize breathing vapor, mist or fumes. Avoid prolonged or repeated contact with skin. Remove contaminated clothing: launder or dry-clean before re-use. Remove contaminated shoes and thoroughly clean before re-use; discard if oil-soaked. Cleanse skin thoroughly after contact, before breaks and meals, and at end of work period. Product is readily removed from skin by waterless hand cleansers followed by washing thoroughly with soap and water.

**VARIABILITY AMONG INDIVIDUALS:** Health studies have shown that many petroleum hydrocarbons and synthetic lubricants pose potential human health risks which may vary from person to person. As a precaution, exposure to liquids, vapors, mists or fumes should be minimized.

## SECTION F - SPILL OR LEAK PROCEDURE

**ENVIRONMENTAL IMPACT:** Report spills as required to the appropriate authorities. U.S. Coast Guard Regulations require immediate reporting of spills that could reach any waterway including intermittent dry creeks. Report spill to the Coast Guard toll free number 800-424-8802. **PROCEDURES IF MATERIAL IS RELEASED OR SPILLED:** Recover free product. Add sand, earth, or other suitable absorbent material to the spill area. Minimize breathing vapors. Minimize skin contact. Keep product out of sewers

and watercourses by diking or impounding. Advise authorities if the product has entered or may enter sewers, watercourses, or extensive land areas.

**ASSURE CONFORMITY WITH ALL APPLICABLE REGULATIONS.**

**WASTE DISPOSAL:** Dispose of in an environmentally safe manner and in accordance with all government regulations to include Federal, State, and local requirements.

## SECTION G - REACTIVITY

**STABILITY:** Stable

**HAZARDOUS POLYMERIZATION:** Will not occur.

**CONDITIONS & MATERIALS TO AVOID:** Avoid heat, open flames and oxidizing materials.

**HAZARDOUS DECOMPOSITION PRODUCTS:** Thermal

decomposition products are highly dependent on the combustion conditions. A complex mixture of airborne solid, liquid, particulates and gases will evolve when this material undergoes combustion. Carbon monoxide and other unidentified organic compounds may be formed upon combustion.

## SECTION H - EMERGENCY & FIRST AID PROCEDURES AND PRIMARY ROUTES OF ENTRY

**EYE CONTACT:** If splashed into the eyes, flush with clear water for 15 minutes or until irritation subsides. If irritation persists, call a physician. **SKIN CONTACT:** In case of skin contact, remove any contaminated clothing and wash skin thoroughly with soap and water. **INGESTION:** If ingested, DO NOT induce vomiting; call a physician immediately.

**INHALATION:** Vapor pressure is very low. Vapor inhalation under ambient temperature conditions is not normally a problem. If overcome by vapor from hot product, immediately remove from exposure and call a physician. Administer oxygen, if available. If over-exposed to oil mist, remove from further exposure until excessive mist oil condition subsides.

## SECTION I - EFFECTS OF OVEREXPOSURE

**SKIN:** Prolonged or repeated skin contact may cause skin irritation. **EYE:** May cause eye irritation. **INGESTION:** Relatively non-toxic.

## SECTION J - TRANSPORTATION INFORMATION

**DEPARTMENT OF TRANSPORTATION (DOT) - DOT Identification Number:** Not Regulated.

**THE PRECISE COMPOSITION OF THIS MIXTURE IS PROPRIETARY INFORMATION. A MORE COMPLETE DISCLOSURE WILL BE PROVIDED TO A PHYSICIAN OR NURSE IN THE EVENT OF A MEDICAL EMERGENCY.**

7 6274

-----  
 SECTION 1 CHEMICAL PRODUCTS & COMPANY IDENTIFICATION  
 -----

OCCUPATIONAL HEALTH SERVICES, INC.  
 11 WEST 42ND STREET, 12TH FLOOR  
 NEW YORK, NEW YORK 10036  
 1-800-445-MSDS (1-800-445-6737) OR  
 1-212-789-3535

FOR EMERGENCY SOURCE INFORMATION  
 CONTACT: 1-615-366-2000 USA

SUBSTANCE: DIESEL FUEL NO. 4

TRADE NAMES/SYNONYMS:

MARINE DIESEL FUEL; DISTILLATE MARINE DIESEL FUEL; NAVAL DISTILLATE FUEL;  
 MARINE DISTILLATE OIL; MDO; OHS76274

CHEMICAL FAMILY:

Petroleum hydrocarbon

CREATION DATE: 09/26/91

REVISION DATE: 01/15/94

-----  
 SECTION 2 COMPOSITION/INFORMATION ON INGREDIENTS  
 -----

COMPONENT : DIESEL FUEL NO. 4  
 PERCENTAGE: >99.0

OTHER CONTAMINANTS: MAY CONTAIN TRACES OF SULFUR

-----  
 SECTION 3 HAZARDS IDENTIFICATION  
 -----

CERCLA RATINGS (SCALE 0-3): HEALTH=3 FIRE=2 REACTIVITY=0 PERSISTENCE=1  
 NFPA RATINGS (SCALE 0-4): HEALTH=U FIRE=2 REACTIVITY=0

EMERGENCY OVERVIEW:

Pale yellow liquid.

Suspect cancer hazard (contains material which can cause cancer in animals).  
 Risk of cancer depends on duration and level of contact. May be irritating  
 to the respiratory tract and eyes. May affect the central nervous system.  
 May damage the lungs. Combustible liquid and vapor.  
 Keep away from all ignition sources. Avoid breathing vapor or mist. Avoid  
 contact with eyes, skin and clothing. Keep container tightly closed. Wash  
 thoroughly after handling. Use only with adequate ventilation.

POTENTIAL HEALTH EFFECTS:

INHALATION:

SHORT TERM EFFECTS: May cause irritation. Additional effects may include  
 coughing, lack of appetite, nausea, vomiting, difficulty breathing,  
 headache, weakness, dizziness, confusion, disorientation, incoordination,  
 restlessness, excitation, bluish skin color, unconsciousness and coma.

LONG TERM EFFECTS: No information available on significant adverse effects.

CONTACT:

SHORT TERM EFFECTS: No information is available.

LONG TERM EFFECTS: No information is available.

CONTACT:

SHORT TERM EFFECTS: May cause irritation.

LONG TERM EFFECTS: No information available on significant adverse effects.

INGESTION:

SHORT TERM EFFECTS: May cause coughing, nausea, vomiting, diarrhea, difficulty breathing, drunkenness and lung damage.

LONG TERM EFFECTS: No information is available.

ADDITIONAL DATA: May cause cancer.

CARCINOGEN STATUS:

OSHA: N

NTP: N

IARC: Y

-----  
SECTION 4

FIRST AID MEASURES  
-----

INHALATION:

FIRST AID- Remove from exposure area to fresh air immediately. If breathing has stopped, perform artificial respiration. Keep person warm and at rest. Treat symptomatically and supportively. Get medical attention immediately.

SKIN CONTACT:

data available

CONTACT:

FIRST AID- Wash eyes immediately with large amounts of water or normal saline, occasionally lifting upper and lower lids, until no evidence of chemical remains (approximately 15-20 minutes). Get medical attention immediately.

INGESTION:

FIRST AID- Only hydrocarbons that are solvents for a toxic agent or are themselves toxic need be evacuated. Extreme care must be used to prevent aspiration. Gastric lavage with a cuffed endotracheal tube in place to prevent further aspiration should be done within 15 minutes. In the absence of depression or convulsions or impaired gag reflex, emesis can also be induced using syrup of ipecac without increasing the hazard of aspiration. Treat symptomatically and supportively. Gastric lavage should be performed by qualified medical personnel. Get medical attention immediately.

NOTE TO PHYSICIAN

ANTIDOTE:

No specific antidote. Treat symptomatically and supportively.

-----  
SECTION 5

FIRE FIGHTING MEASURES  
-----

FIRE AND EXPLOSION HAZARD:

Moderate fire hazard when exposed to heat or flame.

rs are heavier than air and may travel a considerable distance to a sou

of ignition and flash back.

or-air mixtures are explosive above flash point.

EXTINGUISHING MEDIA:

Dry chemical, carbon dioxide, water spray or regular foam (1990 Emergency Response Guidebook, DOT P 5800.5).

For larger fires, use water spray, fog or regular foam (1990 Emergency Response Guidebook, DOT P 5800.5).

FIREFIGHTING:

Move container from fire area if you can do it without risk. Apply cooling water to sides of containers that are exposed to flames until well after fire is out. Stay away from ends of tanks. For massive fire in cargo area, use unmanned hose holder or monitor nozzles; if this is impossible, withdraw from area and let fire burn. Withdraw immediately in case of rising sound from venting safety device or any discoloration of tank due to fire. Isolate for 1/2 mile in all directions if tank, rail car or tank truck is involved in fire (1990 Emergency Response Guidebook, DOT P 5800.5, Guide Page 27).

Extinguish only if flow can be stopped; use flooding amounts of water as a fog, solid streams may be ineffective. Cool containers with flooding amounts of water, apply from as far a distance as possible. Avoid breathing vapors, keep upwind.

FLASH POINT: 140 F (60 C) (PMCC)

FLAMMABILITY CLASS(OSHA): IIIA

HAZARDOUS COMBUSTION PRODUCTS:

Thermal decomposition products may include toxic oxides of sulfur and carbon.

SECTION 6

ACCIDENTAL RELEASE MEASURES

OCCUPATIONAL SPILL:

Shut off ignition sources. Stop leak if you can do it without risk. Use water spray to reduce vapors. For small spills, take up with sand or other absorbent material and place into containers for later disposal. For larger spills, dike far ahead of spill for later disposal. No smoking, flames or flares in hazard area. Keep unnecessary people away; isolate hazard area and restrict entry.

SECTION 7

HANDLING AND STORAGE

Observe all federal, state and local regulations when storing this substance.

Store in accordance with 29 CFR 1910.106.

Bonding and grounding: Substances with low electroconductivity, which may be ignited by electrostatic sparks, should be stored in containers which meet the bonding and grounding guidelines specified in NFPA 77-1983, Recommended Practice on Static Electricity.

Store away from incompatible substances.

-----  
SECTION 8 EXPOSURE CONTROLS/PERSONAL PROTECTION  
-----

EXPOSURE LIMITS:

MINERAL OIL MIST:

- 5 mg/m<sup>3</sup> OSHA TWA
- 5 mg/m<sup>3</sup> ACGIH TWA; 10 mg/m<sup>3</sup> ACGIH STEL  
(Notice of Intended Changes 1993-94)
- 5 mg/m<sup>3</sup> NIOSH recommended TWA;
- 10 mg/m<sup>3</sup> NIOSH recommended STEL

Measurement method: Particulate filter;  
1,1,2-trichloro-1,2,2-trifluoroethane; infrared spectrometry;  
(NIOSH Vol. III # 5026).

HYDROGEN SULFIDE:

- 10 ppm (14 mg/m<sup>3</sup>) OSHA TWA; 15 ppm (21 mg/m<sup>3</sup>) OSHA STEL
- 10 ppm (14 mg/m<sup>3</sup>) ACGIH TWA; 15 ppm (21 mg/m<sup>3</sup>) ACGIH STEL
- 10 ppm NIOSH recommended 10 minute ceiling
- 10 ppm (14 mg/m<sup>3</sup>) DFG MAK TWA;
- 20 ppm (28 mg/m<sup>3</sup>) DFG MAK 10 minute peak, momentary value; 4 times/shift

Measurement method: Drying tube/molecular sieve tube; thermal desorption  
apparatus; gas chromatography with flame ionization detection; (NIOSH  
Vol. II(6) # 296).

- 0 pounds SARA Section 302 Threshold Planning Quantity
- 100 pounds SARA Section 304 Reportable Quantity
- 100 pounds CERCLA Section 103 Reportable Quantity
- 1500 pounds OSHA Process Safety Management Threshold Quantity

\*\*OSHA revoked the final rule limits of January 19, 1989 in response to the  
11th Circuit Court of Appeals decision (AFL-CIO v. OSHA) effective  
June 30, 1993. See 29 CFR 1910.1000 (58 FR 35338)\*\*

VENTILATION:

Process enclosure ventilation recommended to meet published exposure limits.  
Ventilation equipment must be explosion-proof.

EYE PROTECTION:

Employee must wear splash-proof or dust-resistant safety goggles and a  
faceshield to prevent contact with this substance.

Emergency wash facilities:

Where there is any possibility that an employee's eyes and/or skin may be  
exposed to this substance, the employer should provide an eye wash fountain  
and quick drench shower within the immediate work area for emergency use.

CLOTHING:

Wear oil impervious clothing. Avoid prolonged or repeated contact with  
substance. Avoid wearing oil soaked clothing.

**GLOVES:**

Employee must wear appropriate protective gloves to prevent contact with this substance.

**RESPIRATOR:**

The following respirators are recommended based on information found in the physical data, toxicity and health effects sections. They are ranked in order from minimum to maximum respiratory protection.

The specific respirator selected must be based on contamination levels found in the work place, must be based on the specific operation, must not exceed the working limits of the respirator and must be jointly approved by the National Institute for Occupational Safety and Health and the Mine Safety and Health Administration (NIOSH-MSHA).

Any type 'C' supplied-air respirator with a full facepiece operated in pressure-demand or other positive pressure mode or with a full facepiece, helmet or hood operated in continuous-flow mode.

Any self-contained breathing apparatus with a full facepiece operated in pressure-demand or other positive pressure mode.

**FOR FIREFIGHTING AND OTHER IMMEDIATELY DANGEROUS TO LIFE OR HEALTH CONDITIONS:**

Any self-contained breathing apparatus that has a full facepiece and is operated in a pressure-demand or other positive-pressure mode.

Any supplied-air respirator that has a full facepiece and is operated in a pressure-demand or other positive-pressure mode in combination with an auxiliary self-contained breathing apparatus operated in pressure-demand or other positive-pressure mode.

-----  
SECTION 9                      PHYSICAL AND CHEMICAL PROPERTIES  
-----

DESCRIPTION: Pale yellow liquid.  
BOILING POINT: 272-725 F (133-385 C)  
SPECIFIC GRAVITY: 0.840-0.898 @ 60 F  
WATER SOLUBILITY: insoluble  
VISCOSITY: 1.7-4.3 cSt @ 140 F

-----  
SECTION 10                      STABILITY AND REACTIVITY  
-----

REACTIVITY:  
Stable under normal temperatures and pressures.

CONDITIONS TO AVOID:  
Avoid contact with heat, sparks, flames, or other sources of ignition. Vapors may be explosive. Avoid overheating of containers; containers may violently rupture in heat of fire. Avoid contamination of water sources.

Trace amounts of hydrogen sulfide may be present in this product. There is potential for accumulation of hydrogen sulfide in the head space of

containers or in enclosed areas where the product is stored, handled or used.

**COMPATIBILITIES:**

SEL FUEL NO. 4:  
OXIDIZERS (STRONG): Fire and explosion hazard.

**HAZARDOUS DECOMPOSITION:**

Thermal decomposition products may include toxic oxides of sulfur and carbon.

**POLYMERIZATION:**

Hazardous polymerization has not been reported to occur under normal temperatures and pressures.

-----  
**SECTION 11****TOXICOLOGY INFORMATION**  
-----**DIESEL FUEL NO. 4:**

**CARCINOGEN STATUS:** Animal Limited Evidence (IARC Group-2B). Skin application induced squamous-cell tumors in mice.

**ACUTE TOXICITY LEVEL:** No data available.

**TARGET EFFECTS:** Poisoning may affect the liver, kidneys, and lung.\*

\* Based on general information on diesel fuels.

**HEALTH EFFECTS****INHALATION:****DIESEL FUEL NO. 4:**

**ACUTE EXPOSURE-** Diesel fuel vapors or mist may cause respiratory tract irritation. A human exposure to diesel fuel has resulted in immediate cough, dyspnea, cyanosis and unconsciousness for one hour. A productive cough with sputum smelling of diesel fuel persisted for 37 days. Chest X-rays showed diffuse shadowing, most prominent at the lung bases, which resolved slowly with treatment but was still present at day 37. High levels may also cause central nervous system excitation followed by depression with symptoms possibly including restlessness, confusion, ataxia, headache, dizziness, anorexia, nausea, vomiting, weakness, incoordination, stupor, delirium and coma.

**CHRONIC EXPOSURE-** Prolonged or repeated exposure to diesel fuel vapors may cause irritation.

**SKIN CONTACT:**

**FIRST AID-** Remove contaminated clothing and shoes immediately. Wash affected area with soap or mild detergent and large amounts of water until no evidence of chemical remains (approximately 15-20 minutes). Get medical attention immediately.

**EYE CONTACT:****DIESEL FUEL NO. 4:**

**ACUTE EXPOSURE-** Liquid or vapor may cause slight irritation, although tests with one sample of diesel fuel in rabbit eyes was non-irritating.

**CHRONIC EXPOSURE-** Repeated or prolonged exposure may cause irritation.

**INGESTION:**

**DIESEL FUEL NO. 4:**

ACUTE EXPOSURE- Diesel fuel may cause nausea, vomiting, cramping, diarrhea, and possibly symptoms of central nervous system depression. Aspiration of even small amounts during ingestion or vomiting may result in severe pulmonary irritation with coughing, gagging, dyspnea, substernal distress, pneumonitis, pulmonary edema and hemorrhage, and death.

CHRONIC EXPOSURE- No data available.

-----  
SECTION 12 ECOLOGICAL INFORMATION  
-----

ENVIRONMENTAL IMPACT RATING (0-4): no data available

ACUTE AQUATIC TOXICITY: no data available

DEGRADABILITY: no data available

LOG BIOCONCENTRATION FACTOR (BCF): no data available

LOG OCTANOL/WATER PARTITION COEFFICIENT: no data available

-----  
SECTION 13 DISPOSAL INFORMATION  
-----

Observe all federal, state and local regulations when disposing of this substance.

Disposal must be in accordance with standards applicable to generators of hazardous waste, 40 CFR 262. EPA Hazardous Waste Number D001.  
100 pound CERCLA Section 103 Reportable Quantity.

-----  
SECTION 14 TRANSPORTATION INFORMATION  
-----

U.S. DEPARTMENT OF TRANSPORTATION SHIPPING NAME-ID NUMBER, 49 CFR 172.101:  
Diesel fuel-NA 1993

U.S. DEPARTMENT OF TRANSPORTATION HAZARD CLASS OR DIVISION, 49 CFR 172.101:  
3 - Flammable liquid

U.S. DEPARTMENT OF TRANSPORTATION PACKING GROUP, 49 CFR 172.101:  
PG III

U.S. DEPARTMENT OF TRANSPORTATION LABELING REQUIREMENTS, 49 CFR 172.101  
AND SUBPART E:  
None

U.S. DEPARTMENT OF TRANSPORTATION PACKAGING AUTHORIZATIONS:  
EXCEPTIONS: 49 CFR 173.150  
NON-BULK PACKAGING: 49 CFR 173.203  
BULK PACKAGING: 49 CFR 173.241

U.S. DEPARTMENT OF TRANSPORTATION QUANTITY LIMITATIONS 49 CFR 172.101:  
PASSENGER AIRCRAFT OR RAILCAR: 60 l  
PASSENGER AIRCRAFT ONLY: 220 l

## SECTION 15

## REGULATORY INFORMATION

TSCA STATUS: N

CERCLA SECTION 103 (40CFR302.4):	Y	100	pounds	RQ
SARA SECTION 302 (40CFR355.30):	Y	500	pounds	TPQ
SARA SECTION 304 (40CFR355.40):	Y	100	pounds	RQ
SARA SECTION 313 (40CFR372.65):	N			
OSHA PROCESS SAFETY (29CFR1910.119):	Y	1500	pounds	TQ
CALIFORNIA PROPOSITION 65:	N			

SARA HAZARD CATEGORIES, SARA SECTIONS 311/312 (40 CFR 370.21)

ACUTE HAZARD:	N
CHRONIC HAZARD:	Y
FIRE HAZARD:	Y
REACTIVITY HAZARD:	N
SUDDEN RELEASE HAZARD:	N

## SECTION 16

## OTHER

COPYRIGHT 1994 OCCUPATIONAL HEALTH SERVICES, INC. ALL RIGHTS RESERVED.

Licensed to: ICF KAISER INTERNATIONAL, INC &amp; AFFILIATES

to make unlimited paper copies for internal distribution and use only.

07100

SECTION 1 CHEMICAL PRODUCTS & COMPANY IDENTIFICATION

OCCUPATIONAL HEALTH SERVICES, INC.  
11 WEST 42ND STREET, 12TH FLOOR  
NEW YORK, NEW YORK 10036  
1-800-445-MSDS (1-800-445-6737) OR  
1-212-789-3535

FOR EMERGENCY SOURCE INFORMATION  
CONTACT: 1-615-366-2000 USA

CAS NUMBER: 68476-34-6

SUBSTANCE: DIESEL FUEL NO. 2

TRADE NAMES/SYNONYMS:

DIESEL OIL; DIESEL FUEL; DIESEL OIL, MEDIUM; FUELS, DIESEL, NO. 2;  
DIESEL OIL NO. 2-D; DIESEL FUEL OIL NO. 2-D; DIESEL FUEL NO. 2-D;  
NO. 2 DIESEL FUEL; WINTER DIESEL; CHEVRON DIESEL FUEL NO. 2;  
ARCO DIESEL (ARCO PRODUCTS COMPANY); DIESEL FUEL #2; REGULAR DIESEL;  
FUEL OIL#2; OHS07100

CHEMICAL FAMILY:

Petroleum hydrocarbon

CREATION DATE: 03/14/85

REVISION DATE: 01/15/94

SECTION 2 COMPOSITION/INFORMATION ON INGREDIENTS

COMPONENT : DIESEL FUEL NO. 2-D  
CAS NUMBER: 68476-34-6  
PERCENTAGE: >99

OTHER CONTAMINANTS: MAY CONTAIN TRACES OF SULFUR

SECTION 3 HAZARDS IDENTIFICATION

CERCLA RATINGS (SCALE 0-3): HEALTH=3 FIRE=2 REACTIVITY=0 PERSISTENCE=1  
NFPA RATINGS (SCALE 0-4): HEALTH=0 FIRE=2 REACTIVITY=0

EMERGENCY OVERVIEW:

Colorless to yellow-brown liquid with a mild petroleum odor.  
Suspect cancer hazard (contains material which can cause cancer in animals).  
Risk of cancer depends on duration and level of contact. Causes respiratory  
tract and skin irritation. May be irritating to eyes. May affect the central  
nervous system. May affect the kidneys. May damage the lungs. Combustible  
liquid and vapor.  
Keep away from all ignition sources. Avoid breathing vapor or mist. Avoid  
contact with eyes, skin and clothing. Keep container tightly closed. Wash  
thoroughly after handling. Use only with adequate ventilation.

ADDITIONAL HEALTH EFFECTS:

## INHALATION:

SHORT TERM EFFECTS: May cause irritation. Additional effects may include coughing, lack of appetite, nausea, vomiting, headache, weakness, drunkenness, confusion, disorientation, restlessness, excitation, bluish skin color, unconsciousness and coma.

LONG TERM EFFECTS: No information available on significant adverse effects.

## SKIN CONTACT:

SHORT TERM EFFECTS: May cause irritation. Additional effects may include blisters and sores.

LONG TERM EFFECTS: In addition to effects from short term exposure, lack of appetite and kidney damage may occur.

## EYE CONTACT:

SHORT TERM EFFECTS: May cause irritation.

LONG TERM EFFECTS: No information available on significant adverse effects.

## INGESTION:

SHORT TERM EFFECTS: May cause coughing, nausea, vomiting, diarrhea, difficulty breathing, drunkenness and lung damage.

LONG TERM EFFECTS: No information is available.

ADDITIONAL DATA: May cause cancer.

## CARCINOGEN STATUS:

OSHA: N

NTP: N

IARC: Y

## SECTION 4

## FIRST AID MEASURES

## INHALATION:

FIRST AID- Remove from exposure area to fresh air immediately. If breathing has stopped, perform artificial respiration. Keep person warm and at rest. Treat symptomatically and supportively. Get medical attention immediately.

## SKIN CONTACT:

FIRST AID- Remove contaminated clothing and shoes immediately. Wash affected area with soap or mild detergent and large amounts of water until no evidence of chemical remains (approximately 15-20 minutes). Get medical attention immediately.

## EYE CONTACT:

FIRST AID- Wash eyes immediately with large amounts of water or normal saline, occasionally lifting upper and lower lids, until no evidence of chemical remains (approximately 15-20 minutes). Get medical attention immediately.

## INGESTION:

FIRST AID- Only hydrocarbons that are solvents for a toxic agent or are themselves toxic need be evacuated. Extreme care must be used to prevent aspiration. Gastric lavage with a cuffed endotracheal tube in place to prevent further aspiration should be done within 15 minutes. In the absence of depression or convulsions or impaired gag reflex, emesis can also be induced using syrup of ipecac without increasing the hazard of aspiration. Treat symptomatically and supportively. Gastric lavage should be performed by qualified medical personnel. Get medical attention immediately.

## REF TO PHYSICIAN

## ANTIDOTE:

... specific antidote. Treat symptomatically and supportively.

-----  
SECTION 5FIRE FIGHTING MEASURES  
-----

## FIRE AND EXPLOSION HAZARD:

Moderate fire hazard when exposed to heat or flame.

Vapors are heavier than air and may travel a considerable distance to a source of ignition and flash back.

Vapor-air mixtures are explosive above flash point.

## EXTINGUISHING MEDIA:

Dry chemical, carbon dioxide, water spray or regular foam (1990 Emergency Response Guidebook, DOT P 5800.5).

For larger fires, use water spray, fog or regular foam (1990 Emergency Response Guidebook, DOT P 5800.5).

## FIREFIGHTING:

Move container from fire area if you can do it without risk. Apply cooling water to sides of containers that are exposed to flames until well after fire is out. Stay away from ends of tanks. For massive fire in cargo area, use unmanned hose holder or monitor nozzles; if this is impossible, withdraw from area and let fire burn. Withdraw immediately in case of rising sound from venting safety device or any discoloration of tank due to fire. Isolate for 1/2 mile in all directions if tank, rail car or tank truck is involved in fire (1990 Emergency Response Guidebook, DOT P 5800.5, Guide Page 27).

Extinguish only if flow can be stopped; use flooding amounts of water as a fog, solid streams may be ineffective. Cool containers with flooding amounts of water, apply from as far a distance as possible. Avoid breathing vapors, keep upwind.

FLASH POINT: >125 F (>52 C)

LOWER FLAMMABLE LIMIT: 0.6%

UPPER FLAMMABLE LIMIT: 7.5%

AUTOIGNITION: >475 F (>246 C)

FLAMMABILITY CLASS (OSHA): II

## HAZARDOUS COMBUSTION PRODUCTS:

Thermal decomposition products may include toxic oxides of sulfur and carbon.

-----  
SECTION 6ACCIDENTAL RELEASE MEASURES  
-----

## OCCUPATIONAL SPILL:

Shut off ignition sources. Stop leak if you can do it without risk. Use water to reduce vapors. For small spills, take up with sand or other absorbent material and place into containers for later disposal. For larger spills, dike

Ventilation equipment should be explosion-proof if explosive concentrations of dust, vapor or fume are present.

**EYE PROTECTION:**

Employee must wear splash-proof or dust-resistant safety goggles to prevent eye contact with this substance.

Emergency eye wash: Where there is any possibility that an employee's eyes may be exposed to this substance, the employer should provide an eye wash fountain within the immediate work area for emergency use.

**CLOTHING:**

Wear oil impervious clothing. Avoid prolonged or repeated contact with this substance. Avoid wearing oil soaked clothing.

**GLOVES:**

Employee must wear appropriate protective gloves to prevent contact with this substance.

**RESPIRATOR:**

The following respirators are recommended based on information found in the physical data, toxicity and health effects sections. They are ranked in order from minimum to maximum respiratory protection.

The specific respirator selected must be based on contamination levels found in the work place, must be based on the specific operation, must not exceed the working limits of the respirator and must be jointly approved by the National Institute for Occupational Safety and Health and the Mine Safety and Health Administration (NIOSH-MSHA).

Any type 'C' supplied-air respirator with a full facepiece operated in pressure-demand or other positive pressure mode or with a full facepiece, helmet or hood operated in continuous-flow mode.

Any self-contained breathing apparatus with a full facepiece operated in pressure-demand or other positive pressure mode.

**FOR FIREFIGHTING AND OTHER IMMEDIATELY DANGEROUS TO LIFE OR HEALTH CONDITIONS:**

Any self-contained breathing apparatus that has a full facepiece and is operated in a pressure-demand or other positive-pressure mode.

Any supplied-air respirator that has a full facepiece and is operated in a pressure-demand or other positive-pressure mode in combination with an auxiliary self-contained breathing apparatus operated in pressure-demand or other positive-pressure mode.

-----  
**SECTION 9**

**PHYSICAL AND CHEMICAL PROPERTIES**  
-----

**DESCRIPTION:** Colorless to yellow-brown liquid with a mild petroleum odor.

**BOILING POINT:** 350-680 F (177-360 C)

**MELTING POINT:** 0 F (-18 C)

**VAPOR PRESSURE:** 1 mmHg @ 20 C

VAPOR DENSITY: >1  
SPECIFIC GRAVITY: 0.87-0.90  
WATER SOLUBILITY: insoluble  
VISCOSITY: 32.6-40.1 SSU @ 100 F

-----  
SECTION 10STABILITY AND REACTIVITY  
-----

## REACTIVITY:

Stable under normal temperatures and pressures in a closed container.

## CONDITIONS TO AVOID:

Avoid contact with heat, sparks, flames, or other sources of ignition. Vapors may be explosive. Avoid overheating of containers; containers may violently rupture in heat of fire. Avoid contamination of water sources.

Trace amounts of hydrogen sulfide may be present in this product. There is a potential for accumulation of hydrogen sulfide in the head space of containers or in enclosed areas where the product is stored, handled or used.

## INCOMPATIBILITIES:

## DIESEL FUEL:

OXIDIZERS (STRONG): Fire and explosion hazard.

## HAZARDOUS DECOMPOSITION:

Thermal decomposition products may include toxic oxides of sulfur and carbon.

## POLYMERIZATION:

Hazardous polymerization has not been reported to occur under normal temperatures and pressures.

-----  
SECTION 11TOXICOLOGY INFORMATION  
-----

## DIESEL FUEL:

TOXICITY DATA: 7.5 gm/kg (marketplace sample) oral-rat LD50 (AETODY); >5 ml/kg (marketplace sample) skin-rabbit LD50 (AETODY).

CARCINOGEN STATUS: Human Inadequate Evidence, Animal Limited Evidence (IARC Group-2B). (See additional data)

LOCAL EFFECTS: Irritant- inhalation, skin.

ACUTE TOXICITY LEVEL: Slightly toxic by dermal absorption; relatively non-toxic by ingestion.

TARGET EFFECTS: Central nervous system depressant. Poisoning may also affect the liver and kidneys.

ADDITIONAL DATA: Animal studies have confirmed an association between the induction of cancer, primarily of the lung, and inhalation exposure to whole diesel exhaust. Limited epidemiologic evidence also suggests an association between occupational exposure to diesel engine emissions and lung cancer (NIOSH, 1988).

## HEALTH EFFECTS

## INHALATION:

DIESEL FUEL:

IRITANT/NARCOTIC.





CHRONIC HAZARD:	Y
RE HAZARD:	Y
ACTIVITY HAZARD:	N
EN RELEASE HAZARD:	N

-----  
SECTION 16

OTHER  
-----

COPYRIGHT 1994 OCCUPATIONAL HEALTH SERVICES, INC. ALL RIGHTS RESERVED.

Licensed to: ICF KAISER INTERNATIONAL, INC & AFFILIATES  
To make unlimited paper copies for internal distribution and use only.

**ATTACHMENT B**  
**Daily Safety Log**

### TAILGATE SAFETY MEETING FORM

Project Name/Number: \_\_\_\_\_ Date: \_\_\_\_\_ Time: \_\_\_\_\_  
Client: \_\_\_\_\_ Site Location: \_\_\_\_\_  
Work Activities: \_\_\_\_\_  
Hospital Name/Address: \_\_\_\_\_  
Hospital Phone No.: \_\_\_\_\_ Ambulance Phone No.: \_\_\_\_\_  
Directions to Hospital: \_\_\_\_\_

#### Safety Topics Presented

1. \_\_\_\_\_
2. \_\_\_\_\_
3. \_\_\_\_\_
4. \_\_\_\_\_
5. \_\_\_\_\_

Chemical Hazards: \_\_\_\_\_

Physical Hazards: \_\_\_\_\_

#### Personal Protective Equipment:

Activity: _____	PPE: _____

New Equipment: \_\_\_\_\_

Permits Required This Date: \_\_\_\_\_

Attendees	
Name (Print)	Signature
_____	_____
_____	_____
_____	_____

Meeting Conducted By: \_\_\_\_\_

TolTest is not liable for the information presented to non-TolTest associates. Non-TolTest associates are required to conduct their own Tailgate Safety Meeting.



**ATTACHMENT C**  
**Equipment Inspection Log**

**EQUIPMENT INSPECTION FORM**  
**OPERATORS DAILY PRE-OP, MAINTENANCE & SAFETY INSPECTION**

Type:	Hours:	Miles:	- -00	Op:
Inspection Item	OK	N/A	Adjustments/Repairs Made or Required	
Service, Parking & Emergency Brakes				
Steering Mechanism				
Tires, Wheels, Nuts				
Lights, Reflectors				
Coupling Devices				
Operating Controls				
Windshield Wipers				
Horn & Backup Alarm				
Seat Belts/Shoulder Harness				
Fire Extinguisher				
Mirrors				
Hydraulic System Operation				
Fluid Levels (Oil & Water)				
Tracks				

**ATTACHMENT D**

**Incident Forms**

## ASSOCIATE INJURY REPORT

This report is to be initiated by the associate's supervisor. Please answer all questions completely. This report must be forwarded to the Manager, Corporate Health and Safety within 24 hours of the injury/illness.

Injured's Name \_\_\_\_\_ Sex \_\_\_\_\_ SSN \_\_\_\_\_ Birth Date \_\_\_\_\_  
Home Address \_\_\_\_\_  
City \_\_\_\_\_ State \_\_\_\_\_ Zip \_\_\_\_\_ Phone ( ) \_\_\_\_\_  
Job Title \_\_\_\_\_ Hire Date \_\_\_\_\_ Hourly Wage \_\_\_\_\_

Date of Incident \_\_\_\_\_ Time \_\_\_\_\_ Time Reported \_\_\_\_\_ To Whom? \_\_\_\_\_

Project/Department Name \_\_\_\_\_ Address \_\_\_\_\_

Project No \_\_\_\_\_ Time Shift Began \_\_\_\_\_ Did Associate Leave Work?  No  Yes When? \_\_\_\_\_

Has associate returned to work?  No  Yes When \_\_\_\_\_ Did associate miss a regularly scheduled shift?  No  Yes

Doctor/Hospital Name \_\_\_\_\_ Address \_\_\_\_\_

Witness Name(s) \_\_\_\_\_ Statement Attached?  No  Yes

Nature of Injury \_\_\_\_\_ Exact Body Part \_\_\_\_\_

Medical Attention:  None  First Aid On Site  Doctor's Office  Hospital ER  Hospitalized

Job Assignment at Time of Incident \_\_\_\_\_

Describe Incident \_\_\_\_\_

Associate: \_\_\_\_\_  
Print Signature Date

Comments on Incident and Corrective Action(s) \_\_\_\_\_

What Unsafe Condition(s) and/or Act(s) Contributed to the Incident? \_\_\_\_\_

What Corrective Action(s) Have Been Taken to Prevent Recurrence? \_\_\_\_\_

Supervisor: \_\_\_\_\_  
Print Signature Date



## GENERAL LIABILITY, PROPERTY DAMAGE AND LOSS REPORT

This report is to be completed for all losses or damage to company property in excess of \$1000 and all third party damage, regardless of value, resulting from company activities.

Project/Department/Location \_\_\_\_\_ Project No. \_\_\_\_\_ Date \_\_\_\_\_

Address \_\_\_\_\_

How Did Damage or Loss Occur: \_\_\_\_\_

Description and Value (\$) of Damaged/Lost/Stolen Property: \_\_\_\_\_

Location of Damaged/Lost/Stolen Property (Before Loss): \_\_\_\_\_

Date and Time of Damage, Loss or Theft: \_\_\_\_\_

Owner of Damaged/Lost/Stolen Property:

Name \_\_\_\_\_ Phone No. ( ) \_\_\_\_\_

Address \_\_\_\_\_ City \_\_\_\_\_

Employer and Address \_\_\_\_\_

**Injured Parties (Also completed a Supervisor's Associate Injury Report if a Company Associate):**

Name \_\_\_\_\_ Phone No. ( ) \_\_\_\_\_

Address \_\_\_\_\_ City \_\_\_\_\_

Employer and Address \_\_\_\_\_

Description of Injury \_\_\_\_\_

**Witnesses:**

1. Name \_\_\_\_\_ Phone No. ( ) \_\_\_\_\_

Address \_\_\_\_\_ City \_\_\_\_\_

Employer and Address \_\_\_\_\_

2. Name \_\_\_\_\_ Phone No. ( ) \_\_\_\_\_

Address \_\_\_\_\_ City \_\_\_\_\_

Employer and Address \_\_\_\_\_

Were Pictures Taken? Yes No Dept \_\_\_\_\_ Report No. \_\_\_\_\_

Were Police Notified? Yes No

**Completed By:**

\_\_\_\_\_ Print \_\_\_\_\_ Signature \_\_\_\_\_ Date \_\_\_\_\_

**Manager, Corporate Health and Safety:**

\_\_\_\_\_ Print \_\_\_\_\_ Signature \_\_\_\_\_ Date \_\_\_\_\_



**ATTACHMENT E**

**Directions and Area Maps to Hospitals**

## Directions to the Nearest Medical Facility

Legend

- Primary Route
- - - Naval Reservation Boundary

Directions to NSWC Medical Department on site:

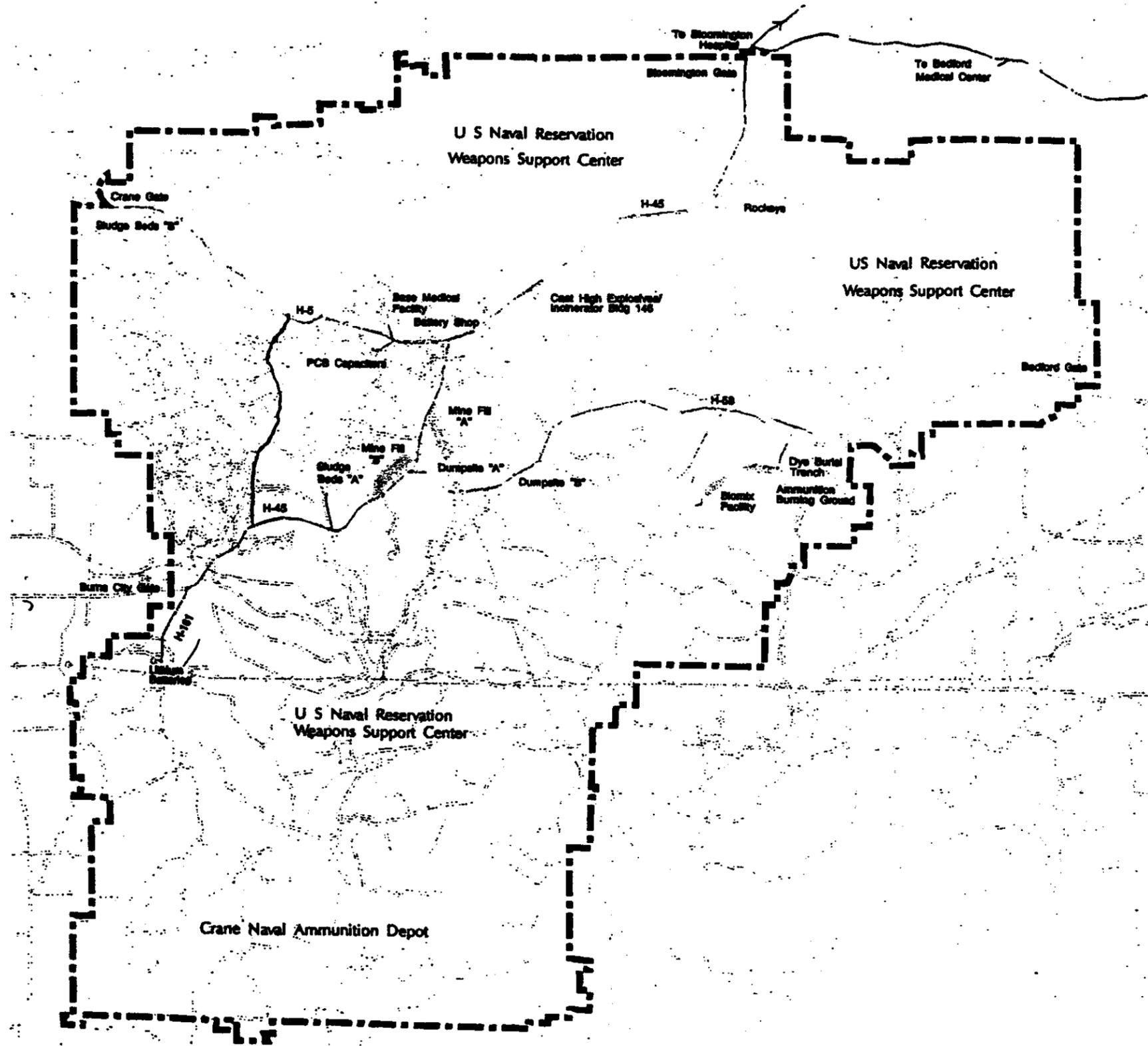
The NSWC Medical Department manages and coordinates the on site ambulance service. Located in Building 12 off of H-2 just north of H-5.

Directions to Bedford Medical Center:

From Main Gate, head east on Highway 58 to the city of Bedford, left onto 16th street. Distance to hospital is approximately 20 miles.

Directions to Bloomington Hospital:

Exit Base on H5-45 through the Bloomington Gate, follow Highway 45 North to Bloomington. At Highway 45 and Highway 37, continue going straight over the bypass (Bloomfield Road), follow Bloomfield road north which turns into 2nd Street. Follow 2nd Street and hospital is on your right.



## **APPENDIX B**

### **SOIL SAMPLING STANDARD OPERATING PROCEDURE**

## **SOP 1.0: Soil Sampling**

### **1.0 Purpose**

This procedure describes the methods which will be used to collect soil samples from the soil containers (drums, rollofs or similar) for disposal characterization.

### **2.0 Tools and Materials**

The following tools and materials are required to obtain soil samples for off-site laboratory analysis.

- Stainless steel trowel or spoons
- Stainless steel auger
- Stainless steel bowls
- Encore sampler
- Encore T-handle and extension
- Disposable gloves
- Sample containers
- Sample labels and tags

### **3.0 Sample Collection**

All sampling equipment used to collect soil samples will be decontaminated as described in section 3.7.1 of the Work Plan and sampling personnel will don clean disposable nitrile gloves prior to collecting the samples.

#### *3.1 Drum Samples*

If the amount of soil removed from the site is contained within one 55 gallon drum, then only one sample from that drum will be obtained. If the soil is contained in two or more drums, then one sample will be obtained from each drum and mixed together to form one composite sample.

Drum samples will be obtained with a stainless steel trowel or spoon from the surface to a depth of 6 inches. All of the soil from the hole(s) will be placed into a stainless steel bowl. Any rocks or organic matter in the sample will be discarded after first removing any soil adhering to it. The spoon or trowel will then be used to thoroughly mix and homogenize the sample within the bowl. The soil in the bowl will be quartered and equal portions from each quarter will be obtained to fill the appropriate labeled sample jars. The sample jar(s) will be tagged and placed in a cooler on ice to await shipment.

### *3.2 Rolloff Box Samples*

If the soil is contained in rolloff boxes (or similar containers), then two grab samples will be obtained from opposite ends of each box to form one composite sample.

Samples will be obtained with a hand auger equipped with a stainless steel bucket. The auger will be advanced to a depth of 12 inches and all of the soil from the auger will be placed into a stainless steel bowl. Any rocks or organic matter in the sample will be discarded after first removing any soil adhering to it. A stainless steel spoon or trowel will then be used to thoroughly mix and homogenize the sample within the bowl. The soil in the bowl will be quartered and equal portions from each quarter will be obtained to fill the appropriate labeled sample jars. The sample jar(s) will be tagged and placed in a cooler on ice to await shipment.

### *3.3 Sampling for Volatile Organic Compounds (VOCs)*

Soil samples for VOC analysis will be collected from the bottom of one of the holes made by either the spoon (in a drum) or the auger (in the rolloff box).

One 5 gram Encore sampler will be snapped into the handle (or handle extension, as necessary) and advanced into undisturbed soil filling the sampler. While the sampler remains locked in the handle, the cap will be locked onto the sampler. Three Encore samplers will be filled in this manner for every sample. The three samplers will be placed into a labeled sealable bag, tagged, and placed in a cooler on ice to await shipment.

## **4.0 QA/QC Sample Collection**

Extra jars for field duplicates and matrix spike/matrix spike duplicates (MS/MSDs) will be filled in the same manner and at the same time as the corresponding regular sample. Two extra Encore samplers will be obtained for VOC samples that require MS/MSD analysis.

## **APPENDIX C**

### **ACTIVITY HAZARD ANALYSIS**

**ROADS AND GROUNDS WORK PLAN  
ACTIVITY HAZARD ANALYSIS**

ACTIVITY: Debris Removal and Site Restoration    ANALYZED BY/DATE: P. Chevalier 05/01    REVIEWED BY/DATE: J. Lyttle 05/01

PRINCIPAL STEPS	POTENTIAL HAZARDS	RECOMMENDED CONTROLS	EQUIPMENT TO BE USED	INSPECTION REQUIREMENTS	TRAINING REQUIREMENTS
<p>Removal of debris from the side of the slope and restoration of the site.</p>	<p>1. Hazards associated with Site Delineation also apply to this scope of work.</p> <p>2. Being struck by heavy equipment.</p> <p>3. Being struck by falling debris being removed from the slope.</p> <p>4. Noise levels exceeding the ACGIH Action of 85dBA are both a hazard and a hindrance to communication.</p>	<p>1. Refer to controls for Site Delineation.</p> <p>2. Workers should be in constant contact with equipment operators when working in the vicinity to ensure good communication between operator or worker.</p> <p>3. Workers should not be down gradient of or within swing radius of lifting devices when debris is being lifted and removed from the site.. Hard hats shall be worn at all times when working around heavy equipment</p> <p>4. Ear muffs or earplugs effectively reduce noise levels.</p>	<p>Backhoe/excavator</p> <p>Hand tools</p> <p>Lifting devices</p>	<p>Daily, prior to use or per manufactures recommendations. Complete Safety Inspection Checklist</p> <p>All chains, lines, cables, and lifting devices shall be inspected daily.</p>	<p>Familiarity with the Work Plan and Safety Plan for this job.</p>

## ROADS AND GROUNDS WORK PLAN ACTIVITY HAZARD ANALYSIS

ACTIVITY: Site Delineation

ANALYZED BY/DATE: P. Chevalier 05/01

REVIEWED BY/DATE: J. Lyttle 05/01

PRINCIPAL STEPS	POTENTIAL HAZARDS	RECOMMENDED CONTROLS	EQUIPMENT TO BE USED	INSPECTION REQUIREMENTS	TRAINING REQUIREMENTS
<p>Site walk to identify and mark work zones for debris removal activities</p>	<ol style="list-style-type: none"> <li>1. Insect bites and exposure to irritant and toxic plants such as poison ivy.</li> <li>2. Surfaces covered with heavy vegetation and undergrowth create a tripping hazard.</li> <li>3. Native wildlife such as rodents, ticks, and snakes present the possibility of bites.</li> <li>4. Thermal stress due to hot/cold temperature extremes.</li> </ol>	<ol style="list-style-type: none"> <li>1. Wear long sleeved clothing and pants to minimize contact with plants and to protect against insect bites. Appropriate first aid for personnel's known allergic reactions.</li> <li>2. Be alert and observe terrain while walking to minimize slips and falls. Steel-toed boots provide additional support and stability.</li> <li>3. Avoid wildlife when possible. In case of an animal bite, perform first aid and capture the animal, if possible, for rabies testing. Perform a tick check after leaving a wooded or vegetated area.</li> <li>4. Implement thermal stress management techniques such as shifting work hours and increasing fluid intake.</li> </ol>	<p>none</p>	<p>none</p>	<ol style="list-style-type: none"> <li>1. Review hazard analysis with personnel performing the site walk prior to start.</li> </ol>

**ROADS AND GROUNDS WORK PLAN  
ACTIVITY HAZARD ANALYSIS**

ACTIVITY: Soil Sampling

ANALYZED BY/DATE: P. Chevalier 05/01

REVIEWED BY/DATE: J. Lyttle 05/01

PRINCIPAL STEPS	POTENTIAL HAZARDS	RECOMMENDED CONTROLS	EQUIPMENT TO BE USED	INSPECTION REQUIREMENTS	TRAINING REQUIREMENTS
Soil screening and sampling	Dermal contact with or inhalation of contaminants, potentially in high concentrations in sampling media.	Don proper PPE if field screening indicates that potentially contaminated soil is present.	Photo-ionization detector Soil sampling tools		OSHA 1910.120 40-hr. training, 8 hr. refresher, Respirator training. Knowledge and training on collection of environmental samples