HEALTH AND SAFETY PLAN

For

PACCAR Automotive, Inc.

Grand Auto/Super Tire Facility

4240/4256 E. 14th Street
Oakland, Ca.

J-6077

HART CROWSER, INC.

HEALTH AND SAFETY PLAN
HART CROWSER, INC.

1.0 PLAN SUMMARY

1.1 Site Location: 4240/4256 E. 14th St., Oakland, California.

1.2 Personnel Responsibilities:

Project Manager: Patrick Lynch
Project Health and Safety Manager: Laura O'Heir
Field Health and Safety Manager: Brian Bjorklund
Corporate Health and Safety Manager: Tom Boden

1.3 Description of Work:

Subsurface excavation and drilling in areas where soils have been found to contain petroleum hydrocarbons, metals, and/or halogenated compounds. Soil samples will be obtained and submitted to a laboratory for chemical analysis.

1.4 Identified Hazards:

Chemical: Soil may potentially be impacted with petroleum hydrocarbons including benzene, metals such as lead and chromium, or halogenated compounds such as tetrachloroethene, trichloroethene, and dichloroethene.

Physical: Slip, trip and fall hazards associated with the use of heavy equipment.

1.5 Monitoring Equipment:

Photoionization Detector -- H-Nu 101
Sensidyne air pump and benzene detector tubes
MSA Combustible Gas/Hydrogen Sulfide/Oxygen meter

1.6 Protective Equipment Available:

Hard Hats
Steel-toed Boots
Nitrile Gloves
Glasses with Shatterproof Lenses
Tyvek Coveralls
Air Purifying Respirators with combination cartridges if needed

1.7 Emergency Services:

Medical
Dial 911 or (510) 534-8055
Highland General Hospital

Fire
Dial 911 or (510) 444-1616
Oakland Fire Dept.

Police
Dial 911 or (510) 273-3211
Oakland Police Dept.

2.0 INTRODUCTION

This health and safety plan is designed to address potential health and safety hazards associated with drilling, excavation, and sampling activities at the Grand Auto/former Super Tire facilities located at 4240/4256 E. 14th Street in Oakland, California. A summary of site-specific information is listed in Section 1.0. A detailed description of health and safety requirements is contained in Sections 3.0 to 12.0.

3.0 ASSIGNMENT OF RESPONSIBILITIES

3.1 Project Manager - Patrick Lynch

- Overall project management
- Assists in development of Health and Safety Plan
- Communicates requirement to Hart Crowser personnel, subcontractors and client.
- Consults with CLIENT and Hart Crowser Corporate Health and Safety Managers regarding unanticipated site conditions which may arise, and subsequent changes to the Plan.

3.2 Project Health and Safety Manager - Laura O'Heir

- Assists in development of Health and Safety Plan.
- Communicates requirements to field personnel, subcontractors and client.
- Consults with Project Manager regarding unanticipated conditions which may arise and subsequent changes to the Plan.

3.3 Field Health and Safety Manager - Brian Bjorklund

- Implements health and safety requirements in the field.
- Communicates requirements to field personnel and subcontractors.
- Consults with Project Manager, Project Health and Safety Manager and CLIENT'S personnel regarding new or unanticipated site conditions.

3.4 Corporate Health and Safety Manager - Tom Boden

- Communicates requirements to Project Health and Safety Manager.
- Responds to field requests for assistance in Health and Safety.

4.0 HAZARD EVALUATION AND CONTROL MEASURES

4.1 Benzene - Proposition 65 warning:

Benzene may be present at the project site. Due to its potential presence, the following warning is given pursuant to Title 22, CCR, Chapter 3, Article 16, Section 12601:

"Warning: This area may contain benzene, a chemical known to the state of California to cause cancer, birth defects and/or other reproductive harm."

4.2 Exposure to Hydrocarbon contaminated soils and particulates

Soil and groundwater contamination by petroleum hydrocarbons has previously been detected in portions of this site. There is a potential that petroleum contaminated soils or groundwater will be encountered during the excavation operations.

CONTROL: Gloves will be worn to guard against incidental exposure to petroleum hydrocarbons. Hands will be washed prior to eating, drinking or smoking. If clothing becomes contaminated, proper precautions must be taken prior to cleaning or disposal.

4.3 Toxic Vapor Exposure - Benzene and other Volatile Organic Compounds (VOCs)

Volatile organic compounds (VOCs) in soil can be released by exposure to open air. This release of vapors can occur from piles of soil, excavation, and during the collection of soil samples. Inhalation of these materials may cause illness (see Section 12). Skin contact with this material also presents an exposure potential.

CONTROL: An H-Nu PID will be used periodically to monitor ambient air if the release of vapors is suspected during activities, or if hydrocarbon odors are detected by smell. Air purifying respirators (APR's) with combination chemical cartridges will be available for use if vapor concentrations reach designated action levels in the breathing zone (Section 5.0). Nitrile gloves and tyvek coveralls may be worn in some instances to prevent skin contact. Monitoring for benzene using a sensidyne pump and detector tube will be conducted in the work area at the beginning of work and whenever the H-Nu PID measures greater than 5 units of the field work. If the concentration of benzene in the breathing zone is detectable, the protective measures outlined in Section 5.0 will be implemented.

4.4 Heavy Equipment Operation

Operation of drilling equipment presents hazards associated with moving machinery and heavy equipment.

CONTROL: Equipment operators will have adequate experience and training to complete the work safely. All personnel onsite will be advised to work safely and avoid unnecessary risks associated with operation of this equipment. Hard hats, steel-toed boots and eye protection will be standard protective equipment.

4.5 Particulates

Dust contaminated with heavy metals and/or petroleum hydrocarbons may be present in the soil onsite. This material presents a potential hazard through skin exposure and possible inhalation.

CONTROL: If significant dust is generated during field work, dust control will be initiated and personnel on the work site will wear APR's equipped with combination organic vapor cartridges and dust pads.

4.6 Site activities

The proposed work is to be conducted in an active retail store parking lot where moving cars may pose a hazard to contractor employees.

CONTROL: Traffic cones and barricades are to be erected wherever contract personnel are expected to traverse within the active parking lot.

4.7 Fire/Explosion

Part of the proposed excavation work is to be conducted in an automotive service bay where the potential of fire and explosions of known and unknown fuel sources may pose a hazard to contractor employees. Combustible vapors emitted by free phase hydrocarbon or contaminated soils in soil cutting piles could possibly ignite, resulting in a fire.

CONTROL: Control of potential sources of ignition is a primary concern during field activities on this project. Smoking will not be allowed at the site during exploratory work. Fire extinguishers will be positioned in close proximity to the site for timely access. Ambient air will be monitored with a PID every 15 minutes. LEL tests will be performed every 15 minutes.

5.0 EXPOSURE MONITORING AND ACTION LEVELS

H-Nu Monitoring *	Protective Measures
0 to 5 ppm	None.
5 to 10 ppm	APR with combination cartridges. Use detection tube monitoring for benzene.
10 to 50 ppm	APR with combination cartridges; ventilate work area.
Greater than 50 ppm	Ventilate work area and stop work until concentrations decrease below 50 ppm.
Calibration:	The H-Nu PI-101 will be calibrated to isobutylene as a benzene standard.

* Concentration in ambient air measured in breathing zone.

LEL/O_2 Monitoring*	Protective Measures
0 to 5 % LEL	None.
5 to 10 % LEL	Increase monitoring frequency.
10 to 20 % LEL	Ventilate work area.
> 20 % LEL	Ventilate work area; stop work until % LEL drops below 20.
Calibration:	The LEL/O_2 meter will be calibrated to ambient air offsite.

* Concentration measured in ambient air.

Detector Tube Monitoring

No Detection	No respirator required
0-1 ppm	APR with combination cartridge
1-5 ppm	APR with combination cartridge, contact Project Health and Safety Manager.

6.0 EQUIPMENT SUMMARY LIST

6.1 General Safety Equipment

- Traffic barricades and cones
- 20 pound Fire Extinguisher
- First Aid Kit
- Barrier flagging

6.2 Monitoring Equipment

H-Nu 101 PID
Sensidyne air pump and benzene detector tubes
MSA Combustible Gas/H_2S/O_2 meter

6.3 Personnel Protective Equipment Available

- Air purifying respirators (APR's) with combination chemical cartridges
- Hard hats
- Steel-toed boots
- Nitrile gloves
- Tyvek coveralls
- Glasses with Shatterproof Lenses

6.4 Decontamination Equipment (if needed)

- Wash buckets
- Long-handled scrub brushes
- Detergent
- Plastic bags
- Steam cleaner

7.0 SPECIAL TASK REQUIREMENTS

7.1 Excavating and Soil Sampling

Soil piles and soil samples produced may contain petroleum hydrocarbons or other unanticipated contaminants. The materials produced during soil excavation will be stockpiled, covered, and stored onsite pending laboratory analysis.

8.0 HEALTH AND SAFETY TRAINING AND MEDICAL MONITORING

All Hart Crowser and subcontractor personnel working at this site will have received a medical evaluation for work with hazardous materials and will have received health and safety training in conformance with OSHA requirements in 29 CFR 1910.120.

9.0 DECONTAMINATION PROCEDURES

All equipment that may have become contaminated during field use will be decontaminated prior to leaving the site. Decontamination of equipment will consist of a soap and water wash followed by a water rinse. Liquids generated during this process will be poured into labeled drums on a daily basis and held pending laboratory analysis.

10.0 SITE SECURITY AND CONTROL

Each work location at this site will be isolated using traffic cones and barricades to divert vehicular traffic. Pedestrian traffic will be diverted away from the work site by traffic cones, flagging and by personnel onsite. All vehicles left overnight will be locked and any open trenches will be secured to limit access.

11.0 EMERGENCY SERVICES

Police, fire and emergency medical services are readily available at this site through use of the 911 system. The nearest telephone is located within the onsite building and Hart Crowser staff will be supplied with a mobile car phone. The nearest emergency medical facility is the Highland General Hospital [(510) 534-8055 at 1411 E. 31st Street in Oakland. A map to this hospital is included with this Plan as Figure 1.

12.0 SPECIFIC HAZARD DATA

Material Safety Data Sheets for specific health and environmental hazards posed by chemical compounds potentially associated with this project are included with this Plan in Attachment B.

13.0 CERTIFICATION

I certify that I have read this Health and Safety Plan and the attached information, and I understand the requirements for health and safety practices on this site.

_____

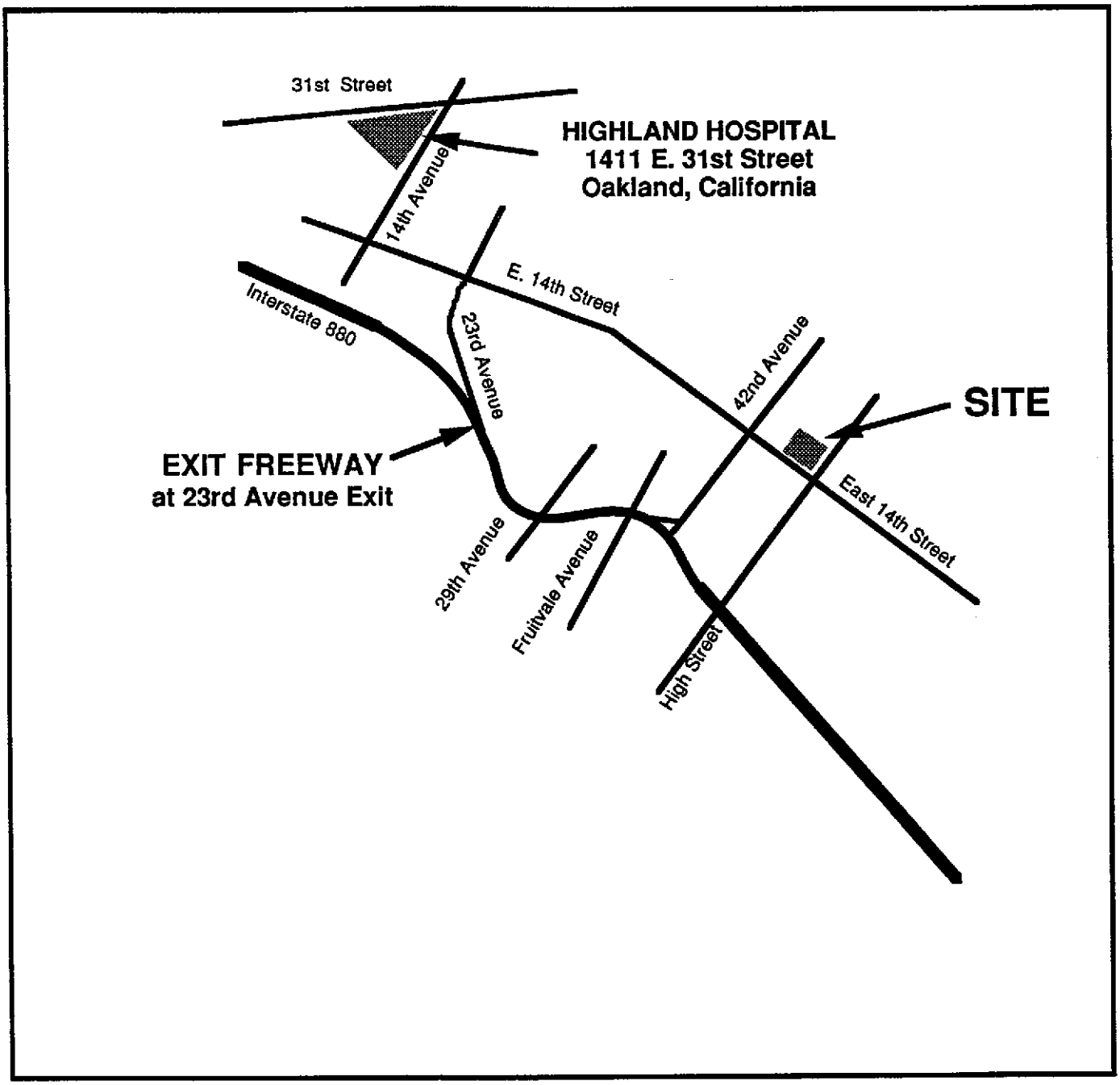
Tom Boden
Health & Safety Manager

_____

Hart Crowser
Field Supervisor

_____

Contractor Supervisor



EMERGENCY ROUTE TO HOSPITAL

Grand Auto Supply
4240 East 14th Street
Oakland, California

HARTCROWSER
J-6077 *7/92*
Figure 1

Material Information Bulletin

(Approved – "Essentially Similar" to Form OSHA 20, Material Safety Data Sheet)

Chevron

CHEVRON GST OIL 100

CMS 234232

TYPICAL COMPOSITION

Hydrocarbon Base Oils	99%
Additives	1%

EXPOSURE STANDARD

The suggested Threshold Limit Value is 5 mg/m^3 (milligrams of material per cubic meter of air) for a daily 8-hour exposure. This is the OSHA exposure standard and the Threshold Limit Value (1980) for mineral oil mists.

PHYSIOLOGICAL & HEALTH EFFECTS	EMERGENCY AND FIRST AID PROCEDURES
Eyes	
Expected to cause no more than minor eye irritation.	Wash eyes with fresh water for at least 15 minutes. If irritation continues, see a doctor.
Skin	
Expected to cause no more than minor skin irritation following prolonged or frequently repeated contact.	Wash skin thoroughly with soap and water. Launder contaminated clothing.
Inhalation	
Not expected to be acutely toxic by inhalation but breathing mineral oil mists at levels above the exposure standard can cause respiratory irritation or discomfort.	If respiratory discomfort or irritation occur, move the person to fresh air. See a doctor is discomfort or irritation continues.
Ingestion	
Not expected to be acutely toxic by ingestion.	If a large volume of this material is swallowed, give a large amount of water to drink, make person vomit, and call a doctor.

Chevron Environmental Health Center/P.O. Box 1272, Richmond, CA 94802
Emergency Phone Number (415) 233-3737

CRR–6745(A)(10M–2–81)Printed in U.S.A.

ADDITIONAL HEALTH DATA

This bulletin was prepared from data available for the major components of this mixture.

SPECIAL PROTECTIVE INFORMATION

Eye Protection: No special eye protection is necessary.

Skin Protection: No special skin protection is necessary.

Respiratory Protection: If operating conditions create airborne concentrations which exceed the exposure standard, the use of an approved respirator is recommended.

Ventilation: Use adequate ventilation to keep the airborne concentrations of this material below the exposure standard.

FIRE PROTECTION

Flash Point: (COC) 240°C (Min.)
Autoignition Temp.: NDA
Flammability Limits: n/a

Extinguishing Media: CO_2, Dry Chemical, Foam, Water Spray.

Special Fire Fighting Procedures: For fires involving this material, do not enter any enclosed or confined fire space without proper protective equipment. This may include self-contained breathing apparatus to protect against the hazardous effects of normal products of combustion or oxygen deficiency. Read the entire bulletin.

ENVIRONMENTAL PROTECTION

Environmental Impact: This material is not expected to present any environmental problems other than those associated with oil spills.

Precautions if Material is Released or Spilled: Clean up spills as soon as possible. Absorb large spills with absorbent clay, diatomaceous earth, or other suitable material.

Waste Disposal Methods: Place contaminated materials in disposable containers and bury in an approved dumping area.

REACTIVITY DATA

Stability (Thermal, Light, etc.): Stable.

Incompatibility (Materials to Avoid): May react with strong oxidizing materials.

Hazardous Decomposition Products: Normal combustion forms carbon dioxide and water vapor; incomplete combustion can produce carbon monoxide.

Hazardous Polymerization: Will not occur.

PHYSICAL PROPERTIES

Solubility: Soluble in hydrocarbon solvents; insoluble in water.

Appearance (Color, Odor, etc.): Yellow liquid.

Boiling Point: n/a
Melting Point: n/a
Specific Gravity: 0.88 @ 15.6/15.6°C
Vapor Pressure (mm Hg & Temp.): n/a
Vapor Density (Air = 1): n/a
Percent Volatile (Volume %): n/a
Evaporation (= 1): n/a
Pour Point: -14°C (Max.)
Viscosity: 90.0-100.0 cSt @ 40°C

n/a = Not Applicable
NDA = No Data Available

Material Safety Data Sheet

Prepared According to the OSHA Hazard Communication Standard (29 CFR 1910.1200). (Formerly Called MATERIAL INFORMATION BULLETIN)

CHEVRON Unleaded Gasoline **CPS 201110**

DANGER! **HARMFUL OR FATAL IF SWALLOWED. VAPOR HARMFUL**
LONG-TERM EXPOSURE TO VAPOR HAS CAUSED CANCER IN LABORATORY ANIMALS
MAY CAUSE EYE AND SKIN IRRITATION. EXTREMELY FLAMMABLE
KEEP OUT OF REACH OF CHILDREN

TYPICAL COMPOSITION

Blend of paraffins, naphthenes, aromatics and olefins including less than the percentages indicated for the following: 25% toluene (CAS 108-88-3), 20% xylenes (CAS 1330-20-7), 10% methyl tert butyl ether (MTBE) (CAS 1634-04-4), 5% benzene (CAS 71-43-2), 5% n-hexane (CAS 110-54-3), 5% cyclohexane (CAS 110-82-7), 5% ethyl benzene (CAS 100-41-4) and 5% naphthalene (CAS 91-20-3)

EXPOSURE STANDARD

The ACGIH (1985-86) TLV for gasoline is 300 ppm for a daily 8-hour exposure. No Federal OSHA exposure standard has been established for this material. See Additional Health Data for discussion of benzene exposure limits.

PHYSIOLOGICAL & HEALTH EFFECTS	EMERGENCY & FIRST AID PROCEDURES
Eyes	
Eye irritation may result from contact with the liquid or exposure to the vapor. The scientific literature warns that vapor concentrations above 500 ppm are irritating.	Flush eyes immediately with fresh water for at least 15 minutes while holding the eyelids open. If irritation persists, see a doctor.
Skin	
Prolonged or frequently repeated liquid contact may cause skin irritation or may cause the skin to become cracked or dry from the defatting action of this material. See Additional Health Data.	Wash skin thoroughly with soap and water. See a doctor if any signs or symptoms described in this MSDS develop or if any skin irritation occurs. Launder contaminated clothing.
Inhalation	
Prolonged or repeated breathing of gasoline vapor may be harmful. See Additional Health Data.	Move exposed person to fresh air. If breathing has stopped, apply artificial respiration. Call a doctor immediately. See Respiratory Protection, Page 2.
Ingestion	
This material is expected to be only slightly toxic by ingestion. **Note to Physician:** See Additional Health Data.	If swallowed, DO NOT make person vomit. Call a doctor immediately.

ADDITIONAL HEALTH DATA
See following pages

SPECIAL PROTECTIVE INFORMATION
Eye Protection: Keep away from eyes. Eye contact can be avoided by wearing chemical safety goggles.
Skin Protection: Keep away from skin. Skin contact can be minimized by wearing impervious protective clothing including gloves.
Respiratory Protection: Avoid prolonged breathing of vapor by using approved respiratory protection. In open areas, such as outdoor gasoline transfer areas, ventilation is usually adequate to prevent prolonged breathing of high gasoline vapor concentrations. See Additional Health Data.
Ventilation: Use this material only in well ventilated areas.
Comment: If you experience any of the signs or symptoms described in this MSDS, you may be exposed to harmful gasoline levels. Your exposure can be minimized if you follow the protective measures presented above.

FIRE PROTECTION
This product presents an extreme fire hazard. Liquid very quickly evaporates, even at low temperatures, and forms vapor (fumes) which can catch fire and burn with explosive violence. Invisible vapor spreads easily and can be set on fire by many sources such as pilot lights, welding equipment, and electrical motors and switches.
Flash Point: (P-M)<-49°F(-45°C)
Autoignition Temp.: NDA
Flammability Limits: 1.4-7.6%
Extinguishing Media: CO_2, Dry Chemical, Foam, Water Fog.
Special Fire Fighting Procedures: For fires involving this material, do not enter any enclosed or confined fire space without proper protective equipment. This may include self-contained breathing apparatus to protect against the hazardous effects of normal products of combustion or oxygen deficiency. Read the entire MSDS.

SPECIAL PRECAUTIONS
See last page of this MSDS.

ENVIRONMENTAL PROTECTION
Environmental Impact: Certain geographical areas have air pollution restrictions concerning the use of materials in work situations which may release volatile components to the atmosphere. Air pollution regulations should be studied to determine if this material is regulated in the area where it is to be used. This material is considered to be a water pollutant and releases of this product should be prevented from contaminating soil and water and from entering drainage and sewer systems.
Precautions if Material is Released or Spilled: Eliminate all sources of ignition in vicinity of spill or released vapor. Clean up small spills using appropriate techniques such as sorbent materials or pumping. Where feasible and appropriate, remove contaminated soil. Follow prescribed procedures for reporting and responding to larger releases.
Waste Disposal Methods: Place contaminated materials in disposable containers and dispose of in a manner consistent with applicable regulations. Contact local environmental or health authorities for approved disposal of this material.

REACTIVITY DATA
Stability (Thermal, Light, etc.): Stable.
Incompatibility (Materials to Avoid): May react with strong oxidizing materials.
Hazardous Decomposition Products: Normal combustion forms carbon dioxide and water vapor; incomplete combustion can produce carbon monoxide.
Hazardous Polymerization: Will not occur.

PHYSICAL PROPERTIES
Solubility: Soluble in hydrocarbons; insoluble in water.
Appearance (Color, Odor, etc.): Clear to yellow liquid.
Boiling Point: 25-225°C (Range)*
Melting Point: n/a
Specific Gravity: 0.7-0.8 (Range)
Vapor Pressure: 5-15 psi (max) @ 100°F(Range)*
Vapor Density (Air=1): 3-4(Range)
Percent Volatile (Volume %): 99+
Evaporation: NDA
*Variable with season and location.

n/a = Not Applicable
NDA = No Data Available

Material Safety Data Sheet

CHEVRON Unleaded Gasoline CPS 201110

ADDITIONAL HEALTH DATA

Ingestion of gasoline or inhalation of gasoline vapor at airborne concentrations exceeding 1000 ppm may cause signs and symptoms of central nervous system depression such as headache, dizziness, loss of appetite, weakness and loss of coordination. Vapor concentrations in excess of 5000 ppm may cause loss of consciousness, coma and death. Intentional exposures to excessively high concentrations (e.g., when used as a drug of abuse) have been reported to result in clinical manifestations that may include convulsions, delirium, and hallucinations. These manifestations are not known to occur following accidental inhalation of vapor or skin contact with gasolines during normal operations. Brief exposures to high vapor concentrations may also cause pulmonary edema and bronchitis. **Note to Physician:** Ingestion of this product or subsequent vomiting can result in aspiration of light hydrocarbon liquid which can cause pneumonitis.

This product may contain up to 4.9% benzene. Repeated or prolonged breathing of benzene vapors has been associated with the development of chromosomal damage in experimental animals and various blood diseases in humans ranging from aplastic anemia to leukemia (a form of cancer). All of these diseases can be fatal. Following a two-year cancer bioassay sponsored by the National Toxicology Program, NTP concluded that benzene is a carcinogen for rats and mice of both sexes. In its Monograph Supplement 4, the International Agency for Research on Cancer (IARC) listed benzene in Group 1, chemicals carcinogenic to humans. No teratogenic effects have been shown to occur in pregnant laboratory animals exposed to doses not acutely toxic to the mother. However, some evidence of fetotoxicity such as delayed physical development has been seen at such levels. The available information on the effects of benzene on human pregnancies is inadequate but it has been established that benzene can cross the human placenta. **Note:** Limiting the total hydrocarbon exposure to 300 ppm, the ACGIH TLV for gasoline, may not keep the benzene concentration below the 10 ppm Federal OSHA exposure standard and ACGIH TLV for benzene.

This product contains n-hexane. Prolonged or repeated contact with n-hexane may produce peripheral neuropathy characterized by progressive weakness and numbness in the extremities, loss of deep tendon reflexes and reduction of motor nerve conduction velocity. Recovery ranges from no recovery to complete recovery depending upon the duration of exposure and the severity of the nerve damage.

This product contains toluene. Toluene has been reported to decrease immunological responses in test animals. It has also been reported that when young rats were exposed to 1000 ppm toluene for 14 hours daily, for two weeks, irreversible hearing loss was detected. The same daily exposure to 700 ppm for as long as 16 weeks was without effect. Since the level necessary to produce hearing loss is greater than 7 times the 1985-86 ACGIH TLV for toluene, worker exposures at or below 100 ppm is not expected to cause any adverse effect. There are also reports that chronic abusers (glue sniffers, solvent huffers) of solvents containing toluene have suffered liver, kidney and brain damage. Scientific studies on toluene have failed to demonstrate teratogenicity in rats and mice. However, toluene has been shown to cause delayed growth and extra ribs in the offspring of rats and mice at inhaled doses (266-399 ppm) that were non-toxic to the mother. Toluene has not conclusively been shown to cause adverse reproductive effects in humans.

This product contains xylene. Xylene has been reported to be embryotoxic, teratogenic and to cause developmental disturbances in rats exposed in utero.

The American Petroleum Institute (API) sponsored a study where laboratory animals were exposed to 67, 292 and 2056 ppm unleaded gasoline vapor six hours/day, five days/week for approximately two years. Each exposure group consisted of 200 rats and 200 mice. During the course of the study, male rats had an increased incidence of kidney damage followed by repair and enlargement of the kidney tubules. At the end of the study, a dose-related incidence of microscopic kidney tumors was detected in the male rats; two tumors were found in the low exposure group, and five were found in the high exposure group. Female rats and both male and female mice did not show this type of lesion. It was noted in the study that the animals that were exposed to gasoline vapor lived longer than the control. Thus, the significance of the tumor findings is difficult to evaluate at this time. Additional findings in the API-sponsored study, which were observed only at the highest dose tested (2065 ppm), included (1) failure to gain body weight, (2) increased incidence of hepatocellular carcinomas (liver cancer) in female mice, and (3) lung inflammation in male and female rats. Subsequent testing has shown that the six to ten carbon isoparaffinic compounds in gasoline are apparently responsible for the early kidney damage seen in the male rat in the API study although the larger isoparaffins have not been individually tested. Information collected by the API and others indicates that the damage occurs only in the male rat, does not occur in female rats or mice and monkeys of either sex and may not occur in man. How this early kidney injury relates to the development of kidney tumors seen in the API study is currently unknown.

The significance to man of the results of the studies discussed above is not known. While we believe that low level or infrequent exposure to gasoline vapor is not likely to cause cancer or other serious disease, in light of the above information, the precautions outlined in this MSDS should be carefully observed. If strong odor of gasoline is present or if any irrritation occurs, individuals should leave the area or institute suitable protective measures (see page 2 - Special Protective Information).

SPECIAL PRECAUTIONS

NEVER siphon gasoline by mouth. READ AND OBSERVE ALL PRECAUTIONS ON PRODUCT LABEL.

Use only as a motor fuel. Do not use for cleaning, pressure appliance fuel, or any other such use. DO NOT USE OR STORE near flame, sparks or hot surfaces. USE AND STORE ONLY IN COOL, WELL VENTILATED AREA. Keep container closed. DO NOT TRANSFER LIQUID TO AN UNLABELED CONTAINER. DO NOT weld, heat or drill container. Replace cap or bung. Emptied container still contains hazardous or explosive vapor or liquid.

HMIS Hazard Rating:

Reactivity: 0, Flammability: 3, Health: 1* (*) Long-term exposure to vapor has caused cancer in laboratory animals.

NEW JERSEY HAZARDOUS SUBSTANCE FACT SHEETS

Topic: DICHLOROACETYLENE

1.0 IDENTIFIERS

CAS Number: 7572-29-4
DOT Number: None

RTK Substance number: 0640
Date: July 1986

2.0 HAZARD SUMMARY

* Dichloroacetylene can affect you when breathed in.
* Exposure can cause you to have headaches, nausea, and facial pain.
* Higher exposure may cause a build-up of fluid in the lungs (pulmonary edema). This can cause death.
* Dichloroacetylene can damage the liver and kidneys.
* Vapor may explode when it reaches its boiling point of 90 degrees F (32.2 degrees C).

IDENTIFICATION

Dichloroacetylene can exist as a liquid, but is found in the workplace as a vapor by-product of heated Trichloroethylene.

REASON FOR CITATION

* Dichloroacetylene is on the Hazardous Substance List because it is cited by ACGIH.

HOW TO DETERMINE IF YOU ARE BEING EXPOSED

* Exposure to hazardous substances should be routinely evaluated. This may include collecting personal and area air samples. You can obtain copies of sampling results from your employer. You have a legal right to this information under OSHA 1910.20.
* If you think you are experiencing any work-related health problems, see a doctor trained to recognize occupational diseases. Take this Fact Sheet with you.

WORKPLACE EXPOSURE LIMITS

ACGIH: The recommended airborne exposure limit is 0.1 ppm, which should not be exceeded at any time.

WAYS OF REDUCING EXPOSURE

* Where possible, enclose operations and use local exhaust ventilation at the site of chemical release. If local exhaust ventilation or enclosure is not used, respirators should be worn.
* Make sure any unenclosed Trichloroethylene is kept well below 158 degrees F (70 degrees C).
* Post hazard and warning information in the work area. In addition, as part of an ongoing education and training effort, communicate all information on the health and safety hazards of Dichloroacetylene to potentially exposed workers.

This Fact Sheet is a summary source of information of all

potential and most severe health hazards that may result from exposure. Duration of exposure, concentration of the substance and other factors will affect your susceptibility to any of the potential effects described below.

3.0 HEALTH HAZARD INFORMATION

Acute Health Effects

The following acute (short-term) health effects may occur immediately or shortly after exposure to Dichloroacetylene:

* Exposure to Dichloroacetylene can cause headaches, severe nausea, vomiting, burning pain in the face and jaw, and paralysis of the face occurring one to three days later.
* Higher exposure may cause a build-up of fluid in the lungs (pulmonary edema). This can cause death.

Chronic Health Effects

The following chronic (long-term) health effects can occur at some time after exposure to Dichloroacetylene and can last for months or years:

Cancer Hazard

* There is limited evidence that Dichloroacetylene causes cancer in animals. It may cause cancer of the kidney.
* Many scientists believe there is no safe level of exposure to a cancer-causing agent. Such substances may also have the potential for causing reproductive damage in humans.

Reproductive Hazard

* According to the information presently available to the New Jersey Department of Health, Dichloroacetylene has not been tested for its ability to adversely affect reproduction.

Other Long-Term Effects

* Long-term exposure to Dichloroacetylene may cause damage of the nervous system leading to weakness and behavior change.
* Dichloroacetylene can damage the kidney and liver.
* Very irritating substances may affect the lungs. It is not known whether Dichloroacetylene causes lung damage.

MEDICAL

Medical Testing

For those with frequent or potentially high exposure (half the TLV or greater), the following are recommended before beginning work and at regular times after that:

* Lung function tests.

If symptoms develop or overexposure is suspected, the following may be useful:

* Liver and kidney function tests.
* Exam of the nervous system.
* Consider chest x-ray after acute overexposure.

Any evaluation should include a careful history of past and present symptoms with an exam. Medical tests that look for

damage already done are not a substitute for controlling exposure.
Request copies of your medical testing. You have a legal right to this information under OSHA 1910.20.

Mixed Exposures
Because smoking can cause heart disease, as well as lung cancer, emphysema, and other respiratory problems, it may worsen respiratory conditions caused by chemical exposure. Even if you have smoked for a long time, stopping now will reduce your risk of developing health problems.

WORKPLACE CONTROLS AND PRACTICES
Unless a less toxic chemical can be substituted for a hazardous substance, ENGINEERING CONTROLS are the most effective way of reducing exposure. The best protection is to enclose operations and/or provide local exhaust ventilation at the site of chemical release. Isolating operations can also reduce exposure. Using respirators or protective equipment is less effective than the controls mentioned above, but is sometimes necessary.
In evaluating the controls present in your workplace, consider: (1) how hazardous the substance is, (2) how much of the substance is released into the workplace and (3) whether harmful skin or eye contact could occur. Special controls should be in place for highly toxic chemicals or when significant skin, eye, or breathing exposures are possible.
In addition, the following control is recommended:
* Where possible, automatically pump liquid Dichloroacetylene from drums or other storage containers to process containers.

Good WORK PRACTICES can help to reduce hazardous exposures.
The following work practices are recommended:
* Workers whose clothing has been contaminated by Dichloroacetylene should change into clean clothing promptly.
* Contaminated work clothes should be laundered by individuals who have been informed of the hazards of exposure to Dichloroacetylene.
* Wash any areas of the body that may have contacted Dichloroacetylene at the end of each workday, whether or not known skin contact has occurred.
* Do not eat, smoke, or drink where Dichloroacetylene is handled, processed, or stored, since the chemical can be swallowed. Wash hands carefully before eating or smoking.

0 PERSONAL PROTECTIVE EQUIPMENT
WORKPLACE CONTROLS ARE BETTER THAN PERSONAL PROTECTIVE EQUIPMENT. However, for some jobs (such as outside work, confined space entry, jobs done only once in a while, or jobs done while workplace controls are being installed), personal protective equipment may be appropriate.
The following recommendations are only guidelines and may not apply to every situation.

Clothing
* Avoid skin contact with Dichloroacetylene. Wear protective gloves and clothing. Safety equipment suppliers/ manufacturers can provide recommendations on the most protective glove/ clothing material for your operation.
* All protective clothing (suits, gloves, footwear, headgear) should be clean, available each day, and put on before work.

Eye Protection
* Wear splash-proof chemical goggles when working with liquid, unless full facepiece respiratory protection is worn.
* Wear gas-proof goggles, unless full facepiece respiratory protection is worn.

Respiratory Protection
IMPROPER USE OF RESPIRATORS IS DANGEROUS. Such equipment should only be used if the employer has a written program that takes into account workplace conditions, requirements for worker training, respirator fit testing and medical exams, as described in OSHA 1910.134.
* If exposure is limited to Dichloroacetylene as a by-product of Trichloroethylene, CONSULT THE N.J. DOH FACT SHEET ON TRICHLOROETHYLENE.
* Where the potential exists for exposures to liquid Dichloroacetylene over 0.1 ppm, use a MSHA/NIOSH approved supplied-air respirator with a full facepiece operated in the positive pressure mode or with a full facepiece, hood, or helmet in the continuous flow mode, or use a MSHA/NIOSH approved self-contained breathing apparatus with a full facepiece operated in pressure-demand or other positive pressure mode.

10 QUESTIONS AND ANSWERS

Q: If I have acute health effects, will I later get chronic health effects?
A: Not always. Most chronic (long-term) effects result from repeated exposures to a chemical.

A: Yes, because long-term effects can occur from repeated exposures to a chemical at levels not high enough to make you immediately sick.

Q: What are my chances of getting sick when I have been exposed to chemicals?
A: The likelihood of becoming sick from chemicals is increased as the amount of exposure increases. This is determined by the length of time and the amount of material to which someone is exposed.

Q: When are higher exposures more likely?
A: Conditions which increase risk of exposure include dust releasing operations (grinding, mixing, blasting, dumping, etc.), other physical and mechanical processes (heating,

pouring, spraying, spills and evaporation from large surface areas such as open containers), and "confined space" exposures (working inside vats, reactors, boilers, small rooms, etc.).

Q: Is the risk of getting sick higher for workers than for community residents?
A: Yes. Exposures in the community, except possibly in cases of fires or spills, are usually much lower than those found in the workplace. However, people in the community may be exposed to contaminated water as well as to chemicals in the air over long periods. Because of this, and because of exposure of children or people who are already ill, community exposures may cause health problems.

Q: Don't all chemicals cause cancer?
A: No. Most chemicals tested by scientists are not cancercausing.

Q: Should I be concerned if a chemical causes cancer in animals?
A: Yes. Most scientists agree that a chemical that causes cancer in animals should be treated as a suspected human carcinogen unless proven otherwise.

Q: But don't they test animals using much higher levels of a chemical than people usually are exposed to?
A: Yes. That's so effects can be seen more clearly using fewer animals. But high doses alone don't cause cancer unless it's a cancer agent. In fact, a chemical that causes cancer in animals at high doses could cause cancer in humans exposed to low doses.

The following information is available from:

New Jersey Department of Health
Occupational Health Service Trenton, NJ 08625-0360 (609) 984-1863

Industrial Hygiene Information
Industrial hygienists are available to answer your questions regarding the control of chemical exposures using exhaust ventilation, special work practices, good housekeeping, good hygiene practices, and personal protective equipment including respirators. In addition, they can help to interpret the results of industrial hygiene survey data.

Medical Evaluation
If you think you are becoming sick because of exposure to chemicals at your workplace, you may call a Department of Health physician who can help you find the services you need.

Public Presentations

Presentations and educational programs on occupational health or the Right to Know Act can be organized for labor unions, trade associations and other groups.

Right to Know Information Resources
The Right to Know Infoline (609) 984-2202 can answer questions about the identity and potential health effects of chemicals, list of educational materials in occupational health, references used to prepare the Fact Sheets, preparation of the Right to Know survey, education and training programs, labeling requirements, and general information regarding the Right to Know Act. Violations of the law should be reported to (609) 984-5627.

DEFINITIONS

ACGIH is the American Conference of Governmental Industrial Hygienists. It recommends upper limits (called TLVs) for exposure to workplace chemicals.

CAG is the Carcinogens Assessment Group of the federal EPA.

A carcinogen is a substance that causes cancer.

The CAS number is assigned by the Chemical Abstracts Service to identify a specific chemical.

A combustible substance is a solid, liquid or gas that will burn.

A corrosive substance is a gas, liquid or solid that causes irreversible damage to human tissue or containers.

DEP is the New Jersey Department of Environmental Protection.

DOT is the Department of Transportation, the federal agency that regulates the transportation of chemicals.

EPA is the Environmental Protection Agency, the federal agency responsible for regulating environmental hazards.

A fetus is an unborn human or animal.

A flammable substance is a solid, liquid, vapor or gas that will ignite easily and burn rapidly.

The flash point is the temperature at which a liquid or solid gives off vapor that can form a flammable mixture with air.

IARC is the International Agency for Research on Cancer, a scientific group that classifies chemicals according to their cancer-causing potential.

A miscible substance is a liquid or gas that will evenly

dissolve in another.

mg/m3 means milligrams of a chemical in a cubic meter of air. It is a measure of concentration (weight/volume).

MSHA is the Mine Safety and Health Administration, the federal agency that regulates mining. It also evaluates and approves respirators.

A mutagen is a substance that causes mutations. A mutation is a change in the genetic material in a body cell. Mutations can lead to birth defects, miscarriages, or cancer.

NCI is the National Cancer Institute, a federal agency that determines the cancer-causing potential of chemicals.

NFPA is the National Fire Protection Association. It classifies substances according to their fire and explosion hazard.

NIOSH is the National Institute for Occupational Safety and Health. It tests equipment, evaluates and approves respirators, conducts studies of workplace hazards, and proposes standards to OSHA.

NTP is the National Toxicology Program which tests chemicals and reviews evidence for cancer.

OSHA is the Occupational Safety and Health Administration, which adopts and enforces health and safety standards.

ppm means parts of a substance per million parts of air. It is a measure of concentration by volume in air.

A reactive substance is a solid, liquid or gas that can cause an explosion under certain conditions or on contact with other specific substances.

A teratogen is a substance that causes birth defects by damaging the fetus.

TLV is the Threshold Limit Value, the workplace exposure limit recommended by ACGIH.

The vapor pressure is a measure of how readily a liquid or a solid mixes with air at its surface. A higher vapor pressure indicates a higher concentration of the substance in air and therefore increases the likelihood of breathing it in.

6.0 EMERGENCY INFORMATION

Common Name: DICHLOROACETYLENE
DOT Number: None
DOT Emergency Guide code: No Citation
CAS Number: 7572-29-4

NEW JERSEY HAZARDOUS SUBSTANCE FACT SHEETS

Topic: DICHLOROACETYLENE

Hazard rating	NJ DOH	NFPA
FLAMMABILITY	Not Found	Not Rated
REACTIVITY	Not Found	Not Rated

MAY BE EXPLOSIVE
POISONOUS GAS IS PRODUCED IN FIRE

Hazard Rating Key: 0=minimal; 1=slight; 2=moderate; 3=serious; 4=severe

FIRE HAZARDS

* Dichloroacetylene is a combustible liquid. It will EXPLODE before it reaches a temperature that is hot enough to burn.
* POISONOUS GAS IS PRODUCED IN FIRE.
* CONTAINERS MAY EXPLODE IN FIRE.
* If employees are expected to fight fires, they must be trained and equipped as stated in OSHA 1910.156.

SPILLS AND EMERGENCIES

If Dichloroacetylene is spilled or leaked, take the following steps:

* Restrict persons not wearing protective equipment from area of spill or leak until clean-up is complete.
* Remove all ignition sources.
* Ventilate area of spill or leak.
* It may be necessary to contain and dispose of Dichloroacetylene as a HAZARDOUS WASTE. Contact your Department of Environmental Protection (DEP) or your regional office of the federal Environmental Protection Agency (EPA) for specific recommendations.

FOR LARGE SPILLS AND FIRES immediately call your fire department. You can request emergency information from the following:

CHEMTREC: (800) 424-9300
NJDEP HOTLINE: (609) 292-7172 Other:

HANDLING AND STORAGE

* Prior to working with Dichloroacetylene you should be trained on its proper handling and storage.
* Dichloroacetylene must be stored to avoid contact with OXIDIZERS (such as PERCHLORATES, PEROXIDES, PERMANGANATES, CHLORATES, and NITRATES) since violent reactions occur.
* Keep Dichloroacetylene away from STRONG ACIDS (such as HYDROCHLORIC, SULFURIC, and NITRIC), because poisonous gases may be given off including Phosgene and Hydrogen Chloride.
* Store in tightly closed containers in a cool well-ventilated area away from HEAT, POTASSIUM, SODIUM, and ALUMINUM POWDER.

* Sources of ignition such as smoking and open flames are prohibited where Dichloroacetylene is used, handled, or stored in a manner that could create a potential fire or explosion hazard.
* Use only nonsparking tools and equipment, especially when opening and closing containers of Dichloroacetylene.
* Wherever Dichloroacetylene is used, handled, manufactured, or stored, use explosion-proof electrical equipment and fittings.

FIRST AID
In NJ, POISON INFORMATION 1-800-962-1253 Other:

Eye Contact
* Immediately flush with large amounts of water for at least 15 minutes, occasionally lifting upper and lower lids.

Skin Contact
* Quickly remove contaminated clothing. Immediately wash contaminated skin with large amounts of soap and water.

Breathing
* Remove the person from exposure.
* Begin rescue breathing if breathing has stopped and CPR if heart action has stopped.
* Transfer promptly to a medical facility.
* Medical observation is recommended for 24 to 48 hours after breathing overexposure, as pulmonary edema may be delayed.

PHYSICAL DATA

Flash Point: Explosive
Water Solubility: Insoluble

OTHER COMMONLY USED NAMES

Chemical Name:
Dichloroethyne

Other Names and Formulations:

DCA

NEW JERSEY DEPARTMENT OF HEALTH
Right to Know Program CN 368, Trenton, NJ 08625-0368 (609) 984-2202

NEW JERSEY HAZARDOUS SUBSTANCE FACT SHEETS

Topic: TRICHLOROETHYLENE

1.0 IDENTIFIERS

CAS Number: 79-01-6
DOT Number: UN 1710

RTK Substance number: 1890
Date: October 1986

2.0 HAZARD SUMMARY

* Trichloroethylene can affect you when breathed in.
* It should be handled as a carcinogen --with extreme caution.
* Exposure can cause you to feel dizzy and to pass out.
* Exposure can cause an irregular heartbeat leading to sudden death.
* High levels may cause brain damage and death. Repeated exposure can cause fatigue, memory loss, headache, irritability, mental confusion, and depression.
* It can damage the liver and kidneys. High exposures can irritate the lungs.
* Prolonged contact can burn the skin.

IDENTIFICATION

Trichloroethylene is a colorless liquid with a sweet odor. It is used as a solvent for degreasing and dry cleaning, and in printing inks, paints, lacquers, varnishes, and adhesives.

REASON FOR CITATION

* Trichloroethylene is on the Hazardous Substance List because it is regulated by OSHA and cited by ACGIH, NIOSH, DOT, IARC, CAG and NFPA.
* This chemical is on the Special Health Hazard Substance List because it is a CANCER-CAUSING AGENT and a MUTAGEN.

HOW TO DETERMINE IF YOU ARE BEING EXPOSED

* Exposure to hazardous substances should be routinely evaluated. This may include collecting air samples. Under OSHA 1910.20, you have a legal right to obtain copies of sampling results from your employer. If you think you are experiencing any work-related health problems, see a doctor trained to recognize occupational diseases. Take this Fact Sheet with you.
* ODOR THRESHOLD = 28 ppm.
* The odor threshold only serves as a warning of exposure. Not smelling it does not mean you are not being exposed.

WORKPLACE EXPOSURE LIMITS

Osha: The legal airborne permissible exposure limit (PEL) is 100 ppm averaged over an 8-hour workshift, 200 ppm as a ceiling limit, and 300 ppm as an acceptable maximum peak above the ceiling limit for 5 minutes duration in any 2 hours.
NIOSH: The recommended airborne exposure limit is 25 ppm averaged over a 10-hour workshift.
ACGIH: The recommended airborne exposure limit is 50 ppm

averaged over an 8-hour workshift and 200 ppm as a STEL (short term exposure limit).
* Trichloroethylene may be a CARCINOGEN in humans. There may be no safe level of exposure to a carcinogen, so all contact should be reduced to the lowest possible level.

WAYS OF REDUCING EXPOSURE
* Where possible, enclose operations and use local exhaust ventilation at the site of chemical release. If local exhaust ventilation or enclosure is not used, respirators should be worn.
* Wear protective work clothing.
* Wash thoroughly immediately after exposure to Trichloroethylene and at the end of the workshift.
* Post hazard and warning information in the work area. In addition, as part of an ongoing education and training effort, communicate all information on the health and safety hazards of Trichloroethylene to potentially exposed workers.

This Fact Sheet is a summary source of information of all potential and most severe health hazards that may result from exposure. Duration of exposure, concentration of the substance and other factors will affect your susceptibility to any of the potential effects described below.

3.0 HEALTH HAZARD INFORMATION

Acute Health Effects
The following acute (short-term) health effects may occur immediately or shortly after exposure to Trichloroethylene:
* Trichloroethylene may irritate the skin, causing a rash or a burning feeling. Prolonged contact can burn and blister the skin.
* The liquid may damage and irritate the eyes.
* Exposure to the vapor can irritate the eyes, nose, throat, and lungs. Higher levels can cause a build-up of fluid (pulmonary edema). This can cause death.
* Exposure can cause lightheadedness, dizziness, visual disturbances, an excited feeling, nausea and vomiting. Very high levels can cause irregular heartbeat, unconsciousness, and death.

Chronic Health Effects
The following chronic (long-term) health effects can occur at some time after exposure to Trichloroethylene and can last for months or years:

Cancer Hazard
* Trichloroethylene may be a CARCINOGEN in humans since it has been shown to cause liver cancer in animals.
* Many scientists believe there is no safe level of exposure to a carcinogen.

Topic: TRICHLOROETHYLENE

Reproductive Hazard
* There appears to be an association between exposure to various solvents (including Trichloroethylene and Toluene) and birth defects among women in the shoe-making industry. Trichloroethylene's role in this association is unclear.
* There is limited evidence that Trichloroethylene is a teratogen in animals. Until further testing has been done, it should be treated as a possible teratogen in humans.

Other Long-Term Effects
* Trichloroethylene may cause a skin allergy. If an allergy develops, very low future exposures can cause itching and a skin rash.
* It can damage the liver and kidneys.
* Repeated exposure can cause memory loss, headache, intolerance of alcohol, depression, and weakness in the arms and legs.
* Prolonged or repeated contact can cause irritation, blistering, roughening, and cracking of the exposed skin. Repeated immersion of the hands in Trichloroethylene may cause paralysis of the fingers.
* Exposure can damage the facial nerves even causing paralysis.

MEDICAL

Medical Testing
For those with frequent or potentially high exposure (half the TLV or greater, or significant skin contact), the following are recommended before beginning work and at regular times after that:
* Liver function tests.

If symptoms develop or overexposure is suspected, the following may be useful:
* Exam of the nervous system. Consider nerve conduction tests.
* Urinary Trichloracetic Acid level (for repeated exposures) or blood Trichlorethylene levels (for acute exposure).
* Consider chest x-ray after acute overexposure.
* Evaluation by a qualified allergist, including careful exposure history and special testing, may help diagnose skin allergy.
* Kidney function tests.

Any evaluation should include a careful history of past and present symptoms with an exam. Medical tests that look for damage already done are not a substitute for controlling exposure.
Request copies of your medical testing. You have a legal right to this information under OSHA 1910.20.

Mixed Exposures
* Drinking alcohol (beer, wine, liquor) may cause a flush on the back and neck in people exposed to Trichloroethylene.
* Because more than light alcohol consumption can cause liver damage, drinking alcohol can increase the liver damage

caused by Trichloroethylene.

WORKPLACE CONTROLS AND PRACTICES
Unless a less toxic chemical can be substituted for a hazardous substance, ENGINEERING CONTROLS are the most effective way of reducing exposure. The best protection is to enclose operations and/or provide local exhaust ventilation at the site of chemical release. Isolating operations can also reduce exposure. Using respirators or protective equipment is less effective than the controls mentioned above, but is sometimes necessary.
In evaluating the controls present in your workplace, consider: (1) how hazardous the substance is, (2) how much of the substance is released into the workplace and (3) whether harmful skin or eye contact could occur. Special controls should be in place for highly toxic chemicals or when significant skin, eye, or breathing exposures are possible.
In addition, the following controls are recommended:
* Where possible, automatically pump liquid Trichloroethylene from drums or other storage containers to process containers.
* Specific engineering controls are recommended for this chemical by NIOSH. Refer to the NIOSH criteria document: Occupational Exposure to Trichloroethylene # 73-11025.

Good WORK PRACTICES can help to reduce hazardous exposures.
The following work practices are recommended:
* Workers whose clothing has been contaminated by Trichloroethylene should change into clean clothing promptly.
* Do not take contaminated work clothes home. Family members could be exposed.
* Contaminated work clothes should be laundered by individuals who have been informed of the hazards of exposure to Trichloroethylene.
* Eye wash fountains should be provided in the immediate work area for emergency use.
* Do not eat, smoke, or drink where Trichloroethylene is handled, processed, or stored, since the chemical can be swallowed. Wash hands carefully before eating or smoking.
* Do not smoke in the work area. Even a little vapor inhaled through a burning cigarette, cigar, or pipe will be converted into more highly toxic substances.

0 PERSONAL PROTECTIVE EQUIPMENT
WORKPLACE CONTROLS ARE BETTER THAN PERSONAL PROTECTIVE EQUIPMENT. However, for some jobs (such as outside work, confined space entry, jobs done only once in a while, or jobs done while workplace controls are being installed), personal protective equipment may be appropriate.
The following recommendations are only guidelines and may not apply to every situation.

Clothing
* Avoid skin contact with Trichloroethylene. Wear protective

gloves and clothing. Safety equipment suppliers/manufacturers can provide recommendations on the most protective glove/clothing material for your operation.
* All protective clothing (suits, gloves, footwear, headgear) should be clean, available each day, and put on before work.
* ACGIH recommends VITON for providing excellent protection.

Eye Protection
* Eye protection is included in the recommended respiratory protection.

Respiratory Protection
IMPROPER USE OF RESPIRATORS IS DANGEROUS. Such equipment should only be used if the employer has a written program that takes into account workplace conditions, requirements for worker training, respirator fit testing and medical exams, as described in OSHA 1910.134.
* At any exposure level use a MSHA/NIOSH approved supplied-air respirator with a full facepiece operated in the positive pressure mode or with a full facepiece, hood, or helmet in the continuous flow mode, or use a MSHA/NIOSH approved self-contained breathing apparatus with a full facepiece operated in pressure-demand or other positive pressure mode.
* Exposure to 1,000 ppm is immediately dangerous to life and health. If the possibility of exposures above 1,000 ppm exists use a MSHA/NIOSH approved self-contained breathing apparatus with a full facepiece operated in continuous flow or other positive pressure mode.

5.0 QUESTIONS AND ANSWERS

Q: If I have acute health effects, will I later get chronic health effects?
A: Not always. Most chronic (long-term) effects result from repeated exposures to a chemical.

Q: Can I get long-term effects without ever having short-term effects?
A: Yes, because long-term effects can occur from repeated exposures to a chemical at levels not high enough to make you immediately sick.

Q: What are my chances of getting sick when I have been exposed to chemicals?
A: The likelihood of becoming sick from chemicals is increased as the amount of exposure increases. This is determined by the length of time and the amount of material to which someone is exposed.

Q: When are higher exposures more likely?
A: Conditions which increase risk of exposure include dust releasing operations (grinding, mixing, blasting, dumping, etc.), other physical and mechanical processes (heating, pouring, spraying, spills and evaporation from large surface areas such as open containers), and "confined

space" exposures (working inside vats, reactors, boilers, small rooms, etc.).

Q: Is the risk of getting sick higher for workers than for community residents?
A: Yes. Exposures in the community, except possibly in cases of fires or spills, are usually much lower than those found in the workplace. However, people in the community may be exposed to contaminated water as well as to chemicals in the air over long periods. Because of this, and because of exposure of children or people who are already ill, community exposures may cause health problems.

Q: Don't all chemicals cause cancer?
A: No. Most chemicals tested by scientists are not cancer-causing.

Q: Should I be concerned if a chemical causes cancer in animals?
A: Yes. Most scientists agree that a chemical that causes cancer in animals should be treated as a suspected human carcinogen unless proven otherwise.

Q: But don't they test animals using much higher levels of a chemical than people usually are exposed to?
A: Yes. That's so effects can be seen more clearly using fewer animals. But high doses alone don't cause cancer unless it's a cancer agent. In fact, a chemical that causes cancer in animals at high doses could cause cancer in humans exposed to low doses.

Q: Who is at the greatest risk from reproductive hazards?
A: Pregnant women are at greatest risk from chemicals that harm the developing fetus. However, chemicals may affect the ability to have children, so both men and women of childbearing age are at high risk.

Q: Should I be concerned if a chemical is a teratogen in animals?
A: Yes. Although some chemicals may affect humans differently than they affect animals, damage to animals suggests that similar damage can occur in humans.

The following information is available from:

New Jersey Department of Health
Occupational Health Service Trenton, NJ 08625-0360 (609) 984-1863

Industrial Hygiene Information
Industrial hygienists are available to answer your questions regarding the control of chemical exposures using exhaust ventilation, special work practices, good housekeeping, good

hygiene practices, and personal protective equipment including respirators. In addition, they can help to interpret the results of industrial hygiene survey data.

Medical Evaluation
If you think you are becoming sick because of exposure to chemicals at your workplace, you may call a Department of Health physician who can help you find the services you need.

Public Presentations
Presentations and educational programs on occupational health or the Right to Know Act can be organized for labor unions, trade associations and other groups.

Right to Know Information Resources
The Right to Know Infoline (609) 984-2202 can answer questions about the identity and potential health effects of chemicals, list of educational materials in occupational health, references used to prepare the Fact Sheets, preparation of the Right to Know survey, education and training programs, labeling requirements, and general information regarding the Right to Know Act. Violations of the law should be reported to (609) 984-5627.

DEFINITIONS

ACGIH is the American Conference of Governmental Industrial Hygienists. It recommends upper limits (called TLVs) for exposure to workplace chemicals.

CAG is the Carcinogens Assessment Group of the federal EPA.

A carcinogen is a substance that causes cancer.

The CAS number is assigned by the Chemical Abstracts Service to identify a specific chemical.

A combustible substance is a solid, liquid or gas that will burn.

A corrosive substance is a gas, liquid or solid that causes irreversible damage to human tissue or containers.

DEP is the New Jersey Department of Environmental Protection.

DOT is the Department of Transportation, the federal agency that regulates the transportation of chemicals.

EPA is the Environmental Protection Agency, the federal agency responsible for regulating environmental hazards.

A fetus is an unborn human or animal.

A flammable substance is a solid, liquid, vapor or gas that

will ignite easily and burn rapidly.

The flash point is the temperature at which a liquid or solid gives off vapor that can form a flammable mixture with air.

IARC is the International Agency for Research on Cancer, a scientific group that classifies chemicals according to their cancer-causing potential.

A miscible substance is a liquid or gas that will evenly dissolve in another.

mg/m3 means milligrams of a chemical in a cubic meter of air. It is a measure of concentration (weight/volume).

MSHA is the Mine Safety and Health Administration, the federal agency that regulates mining. It also evaluates and approves respirators.

A mutagen is a substance that causes mutations. A mutation is a change in the genetic material in a body cell. Mutations can lead to birth defects, miscarriages, or cancer.

NCI is the National Cancer Institute, a federal agency that determines the cancer-causing potential of chemicals.

NFPA is the National Fire Protection Association. It classifies substances according to their fire and explosion hazard.

NIOSH is the National Institute for Occupational Safety and Health. It tests equipment, evaluates and approves respirators, conducts studies of workplace hazards, and proposes standards to OSHA.

NTP is the National Toxicology Program which tests chemicals and reviews evidence for cancer.

OSHA is the Occupational Safety and Health Administration, which adopts and enforces health and safety standards.

ppm means parts of a substance per million parts of air. It is a measure of concentration by volume in air.

A reactive substance is a solid, liquid or gas that can cause an explosion under certain conditions or on contact with other specific substances.

A teratogen is a substance that causes birth defects by damaging the fetus.

TLV is the Threshold Limit Value, the workplace exposure limit recommended by ACGIH.

The vapor pressure is a measure of how readily a liquid or a

solid mixes with air at its surface. A higher vapor pressure indicates a higher concentration of the substance in air and therefore increases the likelihood of breathing it in.

6.0 EMERGENCY INFORMATION

Common Name: TRICHLOROETHYLENE
DOT Number: UN 1710
DOT Emergency Guide code: 74
CAS Number: 79-01-6

Hazard rating	NJ DOH	NFPA
FLAMMABILITY	-	1
REACTIVITY	-	0

POISONOUS GASES ARE PRODUCED IN A FIRE
CONTAINERS MAY EXPLODE IN FIRE

Hazard Rating Key: 0=minimal; 1=slight; 2=moderate; 3=serious; 4=severe

FIRE HAZARDS
* POISONOUS GASES ARE PRODUCED IN FIRE, including Phosgene and Hydrogen Chloride.
* CONTAINERS MAY EXPLODE IN FIRE.
* Use dry chemical or CO2 extinguishers.
* Water can be used to keep fire-exposed containers cool. Water spray can also be used to flush spills away from exposure sources.
* If employees are expected to fight fires, they must be trained and equipped as stated in OSHA 1910.156.

SPILLS AND EMERGENCIES
If Trichloroethylene is spilled or leaked, take the following steps:
* Restrict persons not wearing protective equipment from area of spill or leak until clean-up is complete.
* Remove all ignition sources.
* Ventilate the area of spill or leak.
* Absorb liquids in vermiculite, dry sand, earth, or a similar material and deposit in sealed containers.
* It may be necessary to contain and dispose of Trichloroethylene as a HAZARDOUS WASTE. Contact your Department of Environmental Protection (DEP) or your regional office of the federal Environmental Protection Agency (EPA) for specific recommendations.

FOR LARGE SPILLS AND FIRES immediately call your fire department. You can request emergency information from the following:

CHEMTREC: (800) 424-9300
NJDEP HOTLINE: (609) 292-7172 Other:

NEW JERSEY HAZARDOUS SUBSTANCE FACT SHEETS

Topic: TRICHLOROETHYLENE

HANDLING AND STORAGE

* Prior to working with Trichloroethylene you should be trained on its proper handling and storage.
* Trichloroethylene must be handled and stored away from operations which generate HIGH TEMPERATURES, such as ARC WELDING or CUTTING; UNSHIELDED RESISTANCE HEATING; OPEN FLAMES; and HIGH INTENSITY ULTRAVIOLET LIGHT.
* It must also be handled to avoid contact with HOT METALS. Poisonous gases such as PHOSGENE, and HYDROGEN CHLORIDE are formed.
* Prevent contact of Trichloroethylene with STRONG ALKALIS, such as SODIUM HYDROXIDE or POTASSIUM HYDROXIDE, because a highly flammable, toxic liquid is produced. Also prevent contact with ALUMINUM in the presence of DILUTE HYDROCHLORIC ACID, because a violent reaction will occur.
* Prevent contact with CHEMICALLY ACTIVE METALS, POWDERS, or SHAVINGS, such as BARIUM, LITHIUM, SODIUM, or MAGNESIUM; and TITANIUM POWDERS or SHAVINGS, since an explosion can occur.

FIRST AID

In NJ, POISON INFORMATION 1-800-962-1253 Other:

Eye Contact

* Immediately flush with large amounts of water for at least 15 minutes, occasionally lifting upper and lower lids. Seek medical attention immediately.

Skin Contact

* Quickly remove contaminated clothing. Immediately wash area with large amounts of soap and water. Seek medical attention immediately.

Breathing

* Remove the person from exposure.
* Begin rescue breathing if breathing has stopped and CPR if heart action has stopped.
* Transfer promptly to a medical facility.
* Medical observation is recommended for 24 to 48 hours after breathing overexposure, as pulmonary edema may be delayed.

PHYSICAL DATA

Vapor Pressure: 58 mm Hg at 68 degrees F (20 degrees C)
Water Solubility: Slightly soluble

OTHER COMMONLY USED NAMES

Chemical Name:
Trichloroethene

Other Names and Formulations:
1,1,2-Trichloroethylene; Triclene; Tri; TCE

NEW JERSEY HAZARDOUS SUBSTANCE FACT SHEETS

Topic: TRICHLOROETHYLENE

NEW JERSEY DEPARTMENT OF HEALTH
Right to Know Program CN 368, Trenton, NJ 08625-0368 (609) 984-2202

NEW JERSEY HAZARDOUS SUBSTANCE FACT SHEETS

Topic: TETRACHLOROETHYLENE

1.0 IDENTIFIERS

CAS Number: 127-18-4
DOT Number: UN 1897

RTK Substance number: 1810
Date: March 1987

2.0 HAZARD SUMMARY

* Tetrachloroethylene can affect you when breathed in and by passing through your skin.
* Tetrachloroethylene should be handled as a CARCINOGEN--WITH EXTREME CAUTION.
* It may damage the developing fetus.
* High exposure can cause you to become dizzy and lightheaded and to pass out.
* It can cause the heart to beat irregularly or stop. This can cause death.
* Severe liver and kidney damage can occur.
* High exposure may cause a build-up of fluid in the lungs (pulmonary edema).
* Contact can cause eye and skin burns.

IDENTIFICATION

Tetrachloroethylene is a clear liquid with a sweet chloroform-like odor. It is used in dry cleaning and metal degreasing.

REASON FOR CITATION

* Tetrachloroethylene is on the Hazardous Substance List because it is regulated by OSHA and cited by NIOSH, CAG, ACGIH, DOT and NFPA.
* This chemical is also on the Special Health Hazard Substance List because it is a CARCINOGEN.

HOW TO DETERMINE IF YOU ARE BEING EXPOSED

* Exposure to hazardous substances should be routinely evaluated. This may include collecting air samples. Under OSHA 1910.20, you have a legal right to obtain copies of sampling results from your employer. If you think you are experiencing any work-related health problems, see a doctor trained to recognize occupational diseases. Take this Fact Sheet with you.
* ODOR THRESHOLD = 27 ppm.
* The odor threshold only serves as a warning of exposure. Not smelling it does not mean you are not being exposed.

WORKPLACE EXPOSURE LIMITS

* These exposure limits are for air levels only. OSHA: The legal permissible exposure limits (PEL) are 100 ppm averaged over an 8-hour workshift and an employee may be exposed to a concentration of Tetrachloroethylene above 200 ppm (but never above 300 ppm) only for a maximum period of 5 minutes in any 3 hours.

ACGIH: The recommended airborne exposure limit is 50 ppm averaged over an 8-hour workshift and 200 ppm as a STEL (short term exposure limit). NIOSH: The recommended airborne exposure is the lowest feasible limit.
* Tetrachloroethylene may be a CARCINOGEN in humans. There may be no safe level of exposure to a carcinogen, so all contact should be reduced to the lowest possible level.

WAYS OF REDUCING EXPOSURE
* Where possible, enclose operations and use local exhaust ventilation at the site of chemical release. If local exhaust ventilation or enclosure is not used, respirators should be worn.
* Wear protective work clothing.
* Wash thoroughly immediately after exposure to Tetrachloroethylene and at the end of the workshift.
* Post hazard and warning information in the work area. In addition, as part of an ongoing education and training effort, communicate all information on the health and safety hazards of Tetrachloroethylene to potentially exposed workers.

This Fact Sheet is a summary source of information for workers, employers, and community residents. Health professionals may also find it useful. If this substance is part of a mixture, this Fact Sheet should be used along with the manufacturer-supplied Material Safety Data Sheet (MSDS).

3.0 HEALTH HAZARD INFORMATION

Acute Health Effects
The following acute (short-term) health effects may occur immediately or shortly after exposure to Tetrachloroethylene:
* High exposure can cause you to become dizzy, lightheaded, and to pass out.
* Overexposure can cause the heart to beat irregularly or stop. It can also damage the liver and kidneys enough to cause death.
* Breathing the vapor may irritate the lungs, causing coughing and/or shortness of breath. Higher exposure can cause a build-up of fluid in the lungs (pulmonary edema). This can cause death. These effects can be delayed for many hours.
* Contact with the liquid can cause severe skin burns, and can cause eye burns.
* Exposure to the vapor can irritate the eyes, nose, mouth and throat.

Chronic Health Effects
The following chronic (long-term) health effects can occur at some time after exposure to Tetrachloroethylene and can last for months or years:

Cancer Hazard
* Tetrachloroethylene may be a CARCINOGEN in humans since it causes liver cancer in animals.
* Many scientists believe there is no safe level of exposure

to a carcinogen.

Reproductive Hazard
* Tetrachloroethylene may damage the developing fetus.

Other Long-Term Effects
* Tetrachloroethylene may damage the liver and kidneys with high single exposures or lower repeated exposures.
* Long-term exposure can cause drying and cracking of the skin.
* Very irritating substances may affect the lungs. It is not known whether Tetrachloroethylene causes lung damage.

MEDICAL

Medical Testing
For those with frequent or potentially high exposure (half the TLV or greater, or significant skin contact) the following are recommended before beginning work and at regular times after that:
* Urinalysis.
* Liver function tests.
* Lung function tests.

If symptoms develop or overexposure is suspected, the following may be useful:
* Consider chest x-ray after acute overexposure.
* Special 24 hour EKG (Holter monitor) to look for irregular heart beat.

Any evaluation should include a careful history of past and present symptoms with an exam. Medical tests that look for damage already done are not a substitute for controlling exposure.
Request copies of your medical testing. You have a legal right to this information under OSHA 1910.20.

Mixed Exposures
* Because more than light alcohol consumption can cause liver damage, it can increase the liver damage caused by Tetrachloroethylene.
* Because smoking can cause heart disease, as well as lung cancer, emphysema, and other respiratory problems, it may worsen respiratory conditions caused by chemical exposure. Even if you have smoked for a long time, stopping now will reduce your risk of developing health problems.

WORKPLACE CONTROLS AND PRACTICES
Unless a less toxic chemical can be substituted for a hazardous substance, ENGINEERING CONTROLS are the most effective way of reducing exposure. The best protection is to enclose operations and/or provide local exhaust ventilation at the site of chemical release. Isolating operations can also reduce exposure. Using respirators or protective equipment is less effective than the controls mentioned above, but is sometimes necessary.
In evaluating the controls present in your workplace,

consider: (1) how hazardous the substance is, (2) how much of the substance is released into the workplace and (3) whether harmful skin or eye contact could occur. Special controls should be in place for highly toxic chemicals or when significant skin, eye, or breathing exposures are possible.

In addition, the following controls are recommended:

* Where possible, automatically pump liquid Tetrachloroethylene from drums or other storage containers to process containers.
* Specific engineering controls are recommended for this chemical by NIOSH. Refer to the NIOSH criteria document on Tetrachloroethylene #76-185.

Good WORK PRACTICES can help to reduce hazardous exposures. The following work practices are recommended:

* Workers whose clothing has been contaminated by Tetrachloroethylene should change into clean clothing promptly.
* Do not take contaminated work clothes home. Family members could be exposed.
* Contaminated work clothes should be laundered by individuals who have been informed of the hazards of exposure to Tetrachloroethylene.
* Eye wash fountains should be provided in the immediate work area for emergency use.
* If there is the possibility of skin exposure, emergency shower facilities should be provided.
* On skin contact with Tetrachloroethylene, immediately wash or shower to remove the chemical.
* At the end of the workshift, wash areas of the body that may have had contact with this chemical, whether or not known contact has occurred.
* Do not eat, smoke, or drink where Tetrachloroethylene is handled, processed, or stored, since the chemical can be swallowed. Wash hands carefully before eating or smoking.

4.0 PERSONAL PROTECTIVE EQUIPMENT

WORKPLACE CONTROLS ARE BETTER THAN PERSONAL PROTECTIVE EQUIPMENT. However, for some jobs (such as outside work, confined space entry, jobs done only once in a while, or jobs done while workplace controls are being installed), personal protective equipment may be appropriate.

The following recommendations are only guidelines and may not apply to every situation.

Clothing

* Avoid skin contact with Tetrachloroethylene. Wear solvent-resistant gloves and clothing. Safety equipment suppliers/ manufacturers can provide recommendations on the most protective glove/clothing material for your operation.
* All protective clothing (suits, gloves, footwear, headgear) should be clean, available each day, and put on before work.
* ACGIH recommends Nitrile Rubber, Polyvinyl Alcohol, or Viton as good to excellent protective materials.

Eye Protection
* Eye protection is included in the recommended respiratory protection.

Respiratory Protection
IMPROPER USE OF RESPIRATORS IS DANGEROUS. Such equipment should only be used if the employer has a written program that takes into account workplace conditions, requirements for worker training, respirator fit testing and medical exams, as described in OSHA 1910.134.
* Engineering controls must be effective to ensure that exposure to Tetrachloroethylene does not occur.
* At any exposure level, use a MSHA/NIOSH approved supplied-air respirator with a full facepiece operated in the positive pressure mode or with a full facepiece, hood, or helmet in the continuous flow mode, or use a MSHA/NIOSH approved self-contained breathing apparatus with a full facepiece operated in pressure-demand or other positive pressure mode.

5.0 QUESTIONS AND ANSWERS

Q: If I have acute health effects, will I later get chronic health effects?
A: Not always. Most chronic (long-term) effects result from repeated exposures to a chemical.

Q: Can I get long-term effects without ever having short-term effects?
A: Yes, because long-term effects can occur from repeated exposures to a chemical at levels not high enough to make you immediately sick.

Q: What are my chances of getting sick when I have been exposed to chemicals?
A: The likelihood of becoming sick from chemicals is increased as the amount of exposure increases. This is determined by the length of time and the amount of material to which someone is exposed.

Q: When are higher exposures more likely?
A: Conditions which increase risk of exposure include dust releasing operations (grinding, mixing, blasting, dumping, etc.), other physical and mechanical processes (heating, pouring, spraying, spills and evaporation from large surface areas such as open containers), and "confined space" exposures (working inside vats, reactors, boilers, small rooms, etc.).

Q: Is the risk of getting sick higher for workers than for community residents?
A: Yes. Exposures in the community, except possibly in cases of fires or spills, are usually much lower than those found in the workplace. However, people in the community may be exposed to contaminated water as well as to

chemicals in the air over long periods. Because of this, and because of exposure of children or people who are already ill, community exposures may cause health problems.

Q: Don't all chemicals cause cancer?
A: No. Most chemicals tested by scientists are not cancer-causing.

Q: Should I be concerned if a chemical causes cancer in animals?
A: Yes. Most scientists agree that a chemical that causes cancer in animals should be treated as a suspected human carcinogen unless proven otherwise.

Q: But don't they test animals using much higher levels of a chemical than people usually are exposed to?
A: Yes. That's so effects can be seen more clearly using fewer animals. But high doses alone do not cause cancer unless it's a cancer agent. In fact, a chemical that causes cancer in animals at high doses could cause cancer in humans exposed to low doses.

Q: Aren't pregnant women at the greatest risk from reproductive hazards?
A: Not necessarily. Pregnant women are at greatest risk from chemicals which harm the developing fetus. However, chemicals may affect the ability to have children, so both men and women of childbearing age are at high risk.

0 EMERGENCY INFORMATION

Common Name: TETRACHLOROETHYLENE
DOT Number: UN 1897
DOT Emergency Guide code: 74
CAS Number: 127-18-4

Hazard rating	NJ DOH	NFPA
FLAMMABILITY	-	0
REACTIVITY	-	0

CARCINOGEN
LIVER AND KIDNEY DAMAGE
POISONOUS GASES PRODUCED IN FIRE

Hazard Rating Key: 0=minimal; 1=slight; 2=moderate; 3=serious; 4=severe

FIRE HAZARDS
* Tetrachloroethylene is a non-combustible liquid.
* Extinguish fire using an agent suitable for type of surrounding fire. Tetrachloroethylene itself does not burn.

* POISONOUS GASES ARE PRODUCED IN FIRE, including Hydrogen Chloride and Phosgene.
* If employees are expected to fight fires, they must be trained and equipped as stated in OSHA 1910.156.

SPILLS AND EMERGENCIES

If Tetrachloroethylene is spilled or leaked, take the following steps:

* Restrict persons not wearing protective equipment from area of spill or leak until clean-up is complete.
* Ventilate the area of spill or leak.
* Absorb liquids in vermiculite, dry sand, earth, or a similar material and deposit in sealed containers.
* It may be necessary to contain and dispose of Tetrachloroethylene as a HAZARDOUS WASTE. Contact the NJ Department of Environmental Protection (DEP) or your regional office of the federal Environmental Protection Agency (EPA) for specific recommendations.

FOR LARGE SPILLS AND FIRES immediately call your fire department. You can request emergency information from the following:

DEP HOTLINE: (609) 292-7172
CHEMTREC: (800) 424-9300 Other:

HANDLING AND STORAGE

* Prior to working with Tetrachloroethylene you should be trained on its proper handling and storage.
* Tetrachloroethylene must be stored to avoid contact with STRONG OXIDIZERS, such as CHLORINE, BROMINE, and CHLORINE DIOXIDE; CHEMICALLY ACTIVE METALS, such as BARIUM, LITHIUM, and BERYLLIUM; and NITRIC ACID, since violent reactions occur.
* Store in tightly closed containers in a cool, well-ventilated area away from HEAT.

FIRST AID

NJ POISON INFORMATION 1-800-962-1253

Eye Contact

* Immediately flush with large amounts of water for at least 15 minutes, occasionally lifting upper and lower lids. Seek medical attention.

Skin Contact

* Quickly remove contaminated clothing. Immediately wash area with large amounts of soap and water. Seek medical attention.

Breathing

* Remove the person from exposure.
* Begin rescue breathing if breathing has stopped and CPR if

heart action has stopped.
* Transfer promptly to a medical facility.
* Medical observation is recommended for 24 to 48 hours after breathing overexposure, as pulmonary edema may be delayed.

PHYSICAL DATA
Vapor Pressure: 14 mm Hg at 68 degrees F (20 degrees C)
Water Solubility: Insoluble

OTHER COMMONLY USED NAMES

Chemical Name:
Ethene, Tetrachloro-

Other Names and Formulations:
Perchloroethylene; PERC; Ethylene Tetrachloride

NEW JERSEY DEPARTMENT OF HEALTH
Right to Know Program CN 368, Trenton, NJ 08625-0368 (609) 984-2202

NEW JERSEY HAZARDOUS SUBSTANCE FACT SHEETS

Topic: LEAD

1.0 IDENTIFIERS

CAS Number: 7439-92-1
DOT Number: None

RTK Substance number: 1096
Date: 10/30/86 Revision:

2.0 HAZARD SUMMARY

* Lead can affect you when breathed in and if swallowed from food, drinks, or cigarettes.
* Lead is a TERATOGEN--HANDLE WITH EXTREME CAUTION.
* Repeated exposure causes Lead build-up in the body. Low levels may cause tiredness, mood changes, headaches, stomach problems and trouble sleeping.
* Higher levels may cause aching, weakness, and concentration or memory problems.
* Lead can also cause serious permanent kidney or brain damage at high levels.
* Lead exposure increases risk of high blood pressure.

IDENTIFICATION

Lead is a heavy, soft gray metal. It has wide industrial use due to its properties of high density, softness, low melting point, resistance to corrosion and ability to stop gamma and x-rays.

REASON FOR CITATION

* Lead is on the Hazardous Substance List because it is regulated by OSHA and cited by ACGIH and NIOSH.
* This chemical is on the Special Health Hazard Substance List because it is a TERATOGEN.

HOW TO DETERMINE IF YOU ARE BEING EXPOSED

* Exposure to hazardous substances should be routinely evaluated. This may include collecting personal and area air samples. You can obtain copies of sampling results from your employer. You have a legal right to this information under OSHA 1910.20.
* If you think you are experiencing any work-related health problems, see a doctor trained to recognize occupational diseases. Take this Fact Sheet with you.

WORKPLACE EXPOSURE LIMITS

* These exposure limits are recommended for inorganic Lead dusts and fumes measured as Lead.

OSHA: The legal airborne permissible exposure limit (PEL) is 0.05 mg/m3 averaged over an 8-hour workshift.
NIOSH: The recommended airborne exposure limit is less than 0.10 mg/m3 averaged over an 10-hour workshift.
ACGIH: The recommended airborne exposure limit is 0.15 mg/m3 averaged over an 8-hour workshift.

* Lead is a TERATOGEN. All contact with this chemical should be reduced to the lowest possible level.

Topic: LEAD

WAYS OF REDUCING EXPOSURE

* Where possible, enclose operations and use local exhaust ventilation at the site of chemical release. If local exhaust ventilation or enclosure is not used, respirators should be worn.
* Wear protective work clothing.
* Wash thoroughly at the end of the workshift.
* Post hazard and warning information in the work area. In addition, as part of an ongoing education and training effort, communicate all information on the health and safety hazards of Lead to potentially exposed workers.

This Fact Sheet is a summary source of information of all potential and most severe health hazards that may result from exposure. Duration of exposure, concentration of the substance and other factors will affect your susceptibility to any of the potential effects described below.

1.0 HEALTH HAZARD INFORMATION

Acute Health Effects

The following acute (short-term) health effects may occur immediately or shortly after exposure to Lead:

* Extremely high exposures could cause seizures, but usually symptoms from Lead occur after weeks to months of exposure.

Chronic Health Effects

The following chronic (long-term) health effects can occur at some time after exposure to Lead and can last for months or years:

Cancer Hazard

* According to the information presently available to the New Jersey Department of Health, Lead has not been tested for its ability to cause cancer in animals.

Reproductive Hazard

* Lead is a PROBABLE TERATOGEN in humans.
* Lead may decrease fertility in males and females.

Other Long-Term Effects

* Repeated exposure to Lead causes Lead to build up in the body. The earliest symptoms may be tiredness, trouble sleeping, stomach problems, constipation, headaches and moodiness (mostly irritability and depression).
* Higher levels may cause aching and weakness in your arms and legs, trouble concentrating and remembering things, and may cause a low blood count (anemia).
* Lead can cause serious, permanent kidney and brain damage at high enough levels.
* Lead exposure increases risk of high blood pressure.

MEDICAL

Topic: LEAD

Medical Testing

Before first exposure and every six months thereafter, OSHA (1910.1025) requires your employer to provide:

* Blood Lead test.
* ZPP test (a special test for the effect of Lead on blood cells).

Before first exposure, and yearly for exposed person with blood Lead over 40 micrograms per 100 g of whole blood, OSHA also requires a complete medical history and exam with the above tests, and:

* Complete blood count.
* Kidney function tests.

OSHA defines "exposure" for these tests as air levels averages 30 micrograms of Lead or more in a cubic meter of air. OSHA requires your employer to send the doctor a copy of the Lead standard and provide one for you.

Any evaluation should include a careful history of past and present symptoms with an exam. Medical tests that look for damage already done are not a substitute for controlling exposure.

Request copies of your medical testing. You have a legal right to this information under OSHA 1910.20.

Mixed Exposures

Body exposures to Lead from hobbies using Lead solder or pigments; target practice; and drinking moonshine made in Leaded containers will increase Lead levels. Repeated breathing or handling Leaded gasoline may also add somewhat to body Lead levels.

WORKPLACE CONTROLS AND PRACTICES

Unless a less toxic chemical can be substituted for a hazardous substance, ENGINEERING CONTROLS are the most effective way of reducing exposure. The best protection is to enclose operations and/or provide local exhaust ventilation at the site of chemical release. Isolating operations can also reduce exposure. Using respirators or protective equipment is less effective than the controls mentioned above, but is sometimes necessary.

In evaluating the controls present in your workplace, consider: (1) how hazardous the substance

i, (2) how much of the substance is released into the workplace and (3) whether harmful skin or eye contact could occur. Special controls should be in place for highly toxic chemicals or when significant skin, eye, or breathing exposures are possible.

In addition, the following controls are recommended:

* Avoid heating above 900 dgrees F (482.2 degrees C).
* Specific engineering controls are required for this chemical by OSHA. Refer to the OSHA standard 1910.1025 available from OSHA or your employer.

Good WORK PRACTICES can help to reduce hazardous exposures.

The following work practices are recommended:

* When vacuuming, a high efficiency particulate absolute

(HEPA) filter should be used, not a standard shop vacuum.
* Contaminated work clothes should be laundered by individuals who have been informed of the hazards of exposure to Lead.
* Work clothing should be HEPA vacuumed before removal.
* Do not take contaminated work clothes home. Family members could be exposed.
* Wash any areas of the body that may have contacted Lead at the end of each workday, whether or not known skin contact has occurred.
* Do not eat, smoke, or drink where Lead is handled, processed, or stored, since the chemical can be swallowed. Wash hands carefully before eating or smoking.
* Use a HEPA vacuum or a wet method to reduce dust during clean-up. Do not dry sweep.

4.0 PERSONAL PROTECTIVE EQUIPMENT

WORKPLACE CONTROLS ARE BETTER THAN PERSONAL PROTECTIVE EQUIPMENT. However, for some jobs (such as outside work, confined space entry, jobs done only once in a while, or jobs done while workplace controls are being installed), personal protective equipment may be appropriate.
The following recommendations are only guidelines and may not apply to every situation.

Clothing
* Avoid skin contact with Lead dust and fume. Wear protective gloves, full body and hat clothing. Safety equipment suppliers/manufacturers can provide recommendations on the most protective glove/clothing material for your operation.
* All protective clothing (suits, gloves, footwear, headgear) should be clean, available each day, and put on before work.
* Work clothing should be HEPA vacuumed before removal.

Eye Protection
* Wear dust-proof goggles when working with powders or dust, unless full facepiece respiratory protection is worn.

Respiratory Protection
IMPROPER USE OF RESPIRATORS IS DANGEROUS. Such equipment should only be used if the employer has a written program that takes into account workplace conditions, requirements for worker training, respirator fit testing and medical exams, as described in OSHA 1910.134.
* Where the potential exists for exposures not higher than 0.5 mg/m3, use a half-mask, air purifying respirator equipped with high efficiency filters.
* Where the potential exists for exposures not higher than 2.5 mg/m3, use a full facepiece, air purifying respirator with high efficiency filters.
* OSHA requires the employer to provide a powered-air purifying respirator, instead of one of the above, whenever the employee asks to use this type of respirator.
* OSHA prohibits the employer from requiring an employee to wear one of the above negative pressure respirators longer

than 4.4 hours per day in battery manufacturing and primary and secondary Lead production.

* Where the potential exists for exposures not higher than 50 mg/m3, use any powered-air purifying respirator with high efficiency filters or half-mask supplied-air respirator operated in positive pressure mode.
* If while wearing a filter, cartridge or canister respirator, you can smell, taste or otherwise detect Lead, or in the case of a full facepiece respirator you experience eye irritation, leave the area immediately. Check to make sure the respirator-to-face seal is still good. If it is, replace the filter, cartridge or canister. If the seal is no longer good, you may need a new respirator.
* Be sure to consider all potential exposures in your workplace. You may need a combination of filters, prefilters, cartridges, or canisters to protect against different forms of a chemical (such as vapor and mist) or against a mixture of chemicals.
* Where the potential exists, for exposures not higher than 100 mg/m3, use supplied-air respirators with full facepiece, hood, helmet or suit, operated in positive pressure mode.
* Where the potential exists for exposures greater than 100 mg/m3, use full facepiece, self-contained breathing aparatus operated in positive pressure mode.

5.0 QUESTIONS AND ANSWERS

Q: If I have acute health effects, will I later get chronic health effects?
A: Not always. Most chronic (long-term) effects result from repeated exposures to a chemical.

Q: Can I get long-term effects without ever having short-term effects?
A: Yes, because long-term effects can occur from repeated exposures to a chemical at levels not high enough to make you immediately sick.

Q: What are my chances of getting sick when I have been exposed to chemicals?
A: The likelihood of becoming sick from chemicals is increased as the amount of exposure increases. This is determined by the length of time and the amount of material to which someone is exposed.

Q: When are higher exposures more likely?
A: Conditions which increase risk of exposure include dust releasing operations (grinding, mixing, blasting, dumping, etc.), other physical and mechanical processes (heating, pouring, spraying, spills and evaporation from large surface areas such as open containers), and "confined space" exposures (working inside vats, reactors, boilers, small rooms, etc.).

Q: Is the risk of getting sick higher for workers than for

community residents?

A: Yes. Exposures in the community, except possibly in cases of fires or spills, are usually much lower than those found in the workplace. However, people in the community may be exposed to contaminated water as well as to chemicals in the air over long periods. Because of this, and because of exposure of children or people who are already ill, community exposures may cause health problems.

Q: Can men as well as women be affected by chemicals that cause reproductive system damage?

A: Yes. Some chemicals reduce potency or fertility in both men and women. Some damage sperm and eggs, possibly leading to birth defects.

Q: Who is at the greatest risk from reproductive hazards?

A: Pregnant women are at greatest risk from chemicals that harm the developing fetus. However, chemicals may affect the ability to have children, so both men and women of childbearing age are at high risk.

The following information is available from:

New Jersey Department of Health
Occupational Health Service Trenton, NJ 08625-0360 (609) 984-1863

Industrial Hygiene Information
Industrial hygienists are available to answer your questions regarding the control of chemical exposures using exhaust ventilation, special work practices, good housekeeping, good hygiene practices, and personal protective equipment including respirators. In addition, they can help to interpret the results of industrial hygiene survey data.

Medical Evaluation
If you think you are becoming sick because of exposure to chemicals at your workplace, you may call a Department of Health physician who can help you find the services you need.

Public Presentations
Presentations and educational programs on occupational health or the Right to Know Act can be organized for labor unions, trade associations and other groups.

Right to Know Information Resources
The Right to Know Infoline (609) 984-2202 can answer questions about the identity and potential health effects of chemicals, list of educational materials in occupational health, references used to prepare the Fact Sheets, preparation of the Right to Know survey, education and training programs, labeling requirements, and general information regarding the Right to Know Act. Violations of the law should be reported

to (609) 984-5627.

DEFINITIONS

ACGIH is the American Conference of Governmental Industrial Hygienists. It recommends upper limits (called TLVs) for exposure to workplace chemicals.

CAG is the Carcinogens Assessment Group of the federal EPA.

A carcinogen is a substance that causes cancer.

The CAS number is assigned by the Chemical Abstracts Service to identify a specific chemical.

A combustible substance is a solid, liquid or gas that will burn.

A corrosive substance is a gas, liquid or solid that causes irreversible damage to human tissue or containers.

DEP is the New Jersey Department of Environmental Protection.

DOT is the Department of Transportation, the federal agency that regulates the transportation of chemicals.

EPA is the Environmental Protection Agency, the federal agency responsible for regulating environmental hazards.

A fetus is an unborn human or animal.

A flammable substance is a solid, liquid, vapor or gas that will ignite easily and burn rapidly.

The flash point is the temperature at which a liquid or solid gives off vapor that can form a flammable mixture with air.

IARC is the International Agency for Research on Cancer, a scientific group that classifies chemicals according to their cancer-causing potential.

A miscible substance is a liquid or gas that will evenly dissolve in another.

mg/m3 means milligrams of a chemical in a cubic meter of air. It is a measure of concentration (weight/volume).

MSHA is the Mine Safety and Health Administration, the federal agency that regulates mining. It also evaluates and approves respirators.

A mutagen is a substance that causes mutations. A mutation is a change in the genetic material in a body cell. Mutations can lead to birth defects, miscarriages, or cancer.

NCI is the National Cancer Institute, a federal agency that determines the cancer-causing potential of chemicals.

NFPA is the National Fire Protection Association. It classifies substances according to their fire and explosion hazard.

NIOSH is the National Institute for Occupational Safety and Health. It tests equipment, evaluates and approves respirators, conducts studies of workplace hazards, and proposes standards to OSHA.

NTP is the National Toxicology Program which tests chemicals and reviews evidence for cancer.

OSHA is the Occupational Safety and Health Administration, which adopts and enforces health and safety standards.

ppm means parts of a substance per million parts of air. It is a measure of concentration by volume in air.

A reactive substance is a solid, liquid or gas that can cause an explosion under certain conditions or on contact with other specific substances.

A teratogen is a substance that causes birth defects by damaging the fetus.

TLV is the Threshold Limit Value, the workplace exposure limit recommended by ACGIH.

The vapor pressure is a measure of how readily a liquid or a solid mixes with air at its surface. A higher vapor pressure indicates a higher concentration of the substance in air and

NEW JERSEY HAZARDOUS SUBSTANCE FACT SHEETS

Topic: CHROMIUM

1 0 IDENTIFIERS

CAS Number: 7440-47-3
DOT Number: None

RTK Substance number: 0432
Date: 7/31/86 Revision:

2 0 HAZARD SUMMARY

* Chromium can affect you when breathed in.
* Chromium is a CARCINOGEN--HANDLE WITH EXTREME CAUTION.
* Chromium metal ore has been reported to cause lung allergy.
* Chromium fumes can cause "metal fume fever," a flu-like illness lasting about 24 hours with chills, aches, cough and fever.
* Chromium particles can irritate the eyes.

IDENTIFICATION

Chromium is a steel-gray, lustrous metal often found as a powder. It is used for greatly increasing resistance and durability of metals and for chrome plating of other metals.

REASON FOR CITATION

* It is on the Hazardous Substance List because it is regulated by OSHA and cited by ACGIH, NTP, and IARC.
* This chemical is also on the Special Health Hazard Substance List because it is a CANCER-CAUSING AGENT and a MUTAGEN.

HOW TO DETERMINE IF YOU ARE BEING EXPOSED

* Exposure to hazardous substances should be routinely evaluated. This may include collecting personal and area air samples. You can obtain copies of sampling results from your employer. You have a legal right to this information under OSHA 1910.20.
* If you think you are experiencing any work-related health problems, see a doctor trained to recognize occupational diseases. Take this Fact Sheet with you.

WORKPLACE EXPOSURE LIMITS

OSHA: The legal airborne permissible exposure limit (PEL) is 1 mg/m3 averaged over an 8-hour workshift.
ACGIH: The recommended airborne exposure limit is 0.5 mg/m3 averaged over an 8-hour workshift.

* Chromium is a CANCER-CAUSING AGENT in humans. There may be no safe level of exposure to a carcinogen, so all contact should be reduced to the lowest possible level.
* Chromium may form metal fumes which present different hazards than the substance itself. For further information see page 2.

WAYS OF REDUCING EXPOSURE

* Where possible, enclose operations and use local exhaust ventilation at the site of chemical release. If local

exhaust ventilation or enclosure is not used, respirators should be worn.
* A regulated, marked area should be established where Chromium is handled, used, or stored.
* Wash thoroughly at the end of the workshift.
* Wear protective work clothing.
* Post hazard and warning information in the work area. In addition, as part of an ongoing education and training effort, communicate all information on the health and safety hazards of Chromium to potentially exposed workers.

This Fact Sheet is a summary source of information of all potential and most severe health hazards that may result from exposure. Duration of exposure, concentration of the substance and other factors will affect your susceptibility to any of the potential effects described below.
Metal, metal compounds and alloys are often used in "hot" operations in the workplace. These may include, but are not limited to, welding, brazing, soldering, plating, cutting, and metallizing. At the high temperatures reached in these operations, metals often form metal fumes which have different health effects and exposure standards than the original metal or metal compound and require specialized controls. Your workplace can be evaluated for the presence of particular fumes which may be generated. Consult the appropriate NJ DOH Hazardous Substance Fact Sheet.

3.0 HEALTH HAZARD INFORMATION

Acute Health Effects

The following acute (short-term) health effects may occur immediately or shortly after exposure to Chromium:
* Chromium fumes can cause "metal fume fever," a flu-like illness with metallic taste, fever, chills, and muscle aches lasting about 24 hours.
* Chromium particles can irritate the eyes.

Chronic Health Effects

The following chronic (long-term) health effects can occur at some time after exposure to Chromium and can last for months or years:

Cancer Hazard

* Chromium is a CANCER-CAUSING AGENT in humans. It has been shown to cause lung and throat cancer.
* Many scientists believe there is no safe level of exposure to a cancer-causing agent. Such substances may also have the potential for causing reproductive damage in humans.

Reproductive Hazard

* There is no evidence that Chromium adversely affects reproduction. This is based on test results presently available to the New Jersey Department of Health from published studies.

Other Long-Term Effects
* Chromium ore has been reported to cause lung allergy. Once allergy develops, even small future exposures may cause cough, wheezing, or shortness of breath.

MEDICAL

Medical Testing
For those with frequent or potentially high exposure (half the TLV or greater), the following are recommended before beginning work and at regular times after that:
* Lung function tests. These may be normal if person is not having an attack at the time of the test.
If symptoms develop or overexposure is suspected, the following may be useful:
* Consider urine Chromium levels. Persons without workplace exposure usually have levels below 15 micrograms per liter of urine.
* Lung function tests. These may be normal if the person is not having an attack at the time of the test.
Any evaluation should include a careful history of past and present symptoms with an exam. Medical tests that look for damage already done are not a substitute for controlling exposure.
Request copies of your medical testing. You have a legal right to this information under OSHA 1910.20.

WORKPLACE CONTROLS AND PRACTICES
Unless a less toxic chemical can be substituted for a hazardous substance, ENGINEERING CONTROLS are the most effective way of reducing exposure. The best protection is to enclose operations and/or provide local exhaust ventilation at the site of chemical release. Isolating operations can also reduce exposure. Using respirators or protective equipment is less effective than the controls mentioned above, but is sometimes necessary.
In evaluating the controls present in your workplace, consider: (1) how hazardous the substance is, (2) how much of the substance is released into the workplace and (3) whether harmful skin or eye contact could occur. Special controls should be in place for highly toxic chemicals or when significant skin, eye, or breathing exposures are possible. In addition, the following control is recommended:
* Specific engineering controls are recommended for this chemical by NIOSH. Refer to the NIOSH criteria document: Occupational Exposure to Chromium VI #76-129.
Good WORK PRACTICES can help to reduce hazardous exposures. The following work practices are recommended:
* Do not take contaminated work clothes home. Family members could be exposed.
* Contaminated work clothes should be laundered by individuals who have been informed of the hazards of exposure to Chromium.
* Wash any areas of the body that may have contacted Chromium at the end of each workday, whether or not known skin

contact has occurred.
* Do not eat, smoke, or drink where Chromium is handled, processed, or stored, since the chemical can be swallowed. Wash hands carefully before eating or smoking.
* Use a vacuum or a wet method to reduce dust during clean-up. Do not dry sweep.
* When vacuuming, a high efficiency particulate absolute (HEPA) filter should be used, not a standard shop vacuum.

10 PERSONAL PROTECTIVE EQUIPMENT

WORKPLACE CONTROLS ARE BETTER THAN PERSONAL PROTECTIVE EQUIPMENT. However, for some jobs (such as outside work, confined space entry, jobs done only once in a while, or jobs done while workplace controls are being installed), personal protective equipment may be appropriate.
The following recommendations are only guidelines and may not apply to every situation.

Clothing

* Avoid skin contact with Chromium. Wear protective gloves and clothing. Safety equipment suppliers/manufacturers can provide recommendations on the most protective glove/clothing material for your operation.
* All protective clothing (suits, gloves, footwear, headgear) should be clean, available each day, and put on before work.

Eye Protection

* Eye protection is included with the recommended respiratory protection.

Respiratory Protection

IMPROPER USE OF RESPIRATORS IS DANGEROUS. Such equipment should only be used if the employer has a written program that takes into account workplace conditions, requirements for worker training, respirator fit testing and medical exams, as described in OSHA 1910.134.
* At any exposure level, use a MSHA/NIOSH approved supplied-air respirator with a full facepiece operated in the positive pressure mode or with a full facepiece, hood, or helmet in the continuous flow mode, or use a MSHA/NIOSH approved self-contained breathing apparatus with a full facepiece operated in pressure-demand or other positive pressure mode.

11.0 QUESTIONS AND ANSWERS

Q: If I have acute health effects, will I later get chronic health effects?
A: Not always. Most chronic (long-term) effects result from repeated exposures to a chemical.

Q: Can I get long-term effects without ever having short-term effects?
A: Yes, because long-term effects can occur from repeated exposures to a chemical at levels not high enough to make

you immediately sick.

Q: What are my chances of getting sick when I have been exposed to chemicals?
A: The likelihood of becoming sick from chemicals is increased as the amount of exposure increases. This is determined by the length of time and the amount of material to which someone is exposed.

Q: When are higher exposures more likely?
A: Conditions which increase risk of exposure include dust releasing operations (grinding, mixing, blasting, dumping, etc.), other physical and mechanical processes (heating, pouring, spraying, spills and evaporation from large surface areas such as open containers), and "confined space" exposures (working inside vats, reactors, boilers, small rooms, etc.).

Q: Is the risk of getting sick higher for workers than for community residents?
A: Yes. Exposures in the community, except possibly in cases of fires or spills, are usually much lower than those found in the workplace. However, people in the community may be exposed to contaminated water as well as to chemicals in the air over long periods. Because of this, and because of exposure of children or people who are already ill, community exposures may cause health problems.

Q: Don't all chemicals cause cancer?
A: No. Most chemicals tested by scientists are not cancer-causing.

The following information is available from:

New Jersey Department of Health
Occupational Health Service Trenton, NJ 08625-0360 (609) 984-1863

Industrial Hygiene Information
Industrial hygienists are available to answer your questions regarding the control of chemical exposures using exhaust ventilation, special work practices, good housekeeping, good hygiene practices, and personal protective equipment including respirators. In addition, they can help to interpret the results of industrial hygiene survey data.

Medical Evaluation
If you think you are becoming sick because of exposure to chemicals at your workplace, you may call a Department of Health physician who can help you find the services you need.

Public Presentations
Presentations and educational programs on occupational health

or the Right to Know Act can be organized for labor unions, trade associations and other groups.

Right to Know Information Resources
The Right to Know Infoline (609) 984-2202 can answer questions about the identity and potential health effects of chemicals, list of educational materials in occupational health, references used to prepare the Fact Sheets, preparation of the Right to Know survey, education and training programs, labeling requirements, and general information regarding the Right to Know Act. Violations of the law should be reported to (609) 984-5627.

DEFINITIONS

ACGIH is the American Conference of Governmental Industrial Hygienists. It recommends upper limits (called TLVs) for exposure to workplace chemicals.

CAG is the Carcinogens Assessment Group of the federal EPA.

A carcinogen is a substance that causes cancer.

The CAS number is assigned by the Chemical Abstracts Service to identify a specific chemical.

A combustible substance is a solid, liquid or gas that will burn.

A corrosive substance is a gas, liquid or solid that causes irreversible damage to human tissue or containers.

DEP is the New Jersey Department of Environmental Protection.

DOT is the Department of Transportation, the federal agency that regulates the transportation of chemicals.

EPA is the Environmental Protection Agency, the federal agency responsible for regulating environmental hazards.

A fetus is an unborn human or animal.

A flammable substance is a solid, liquid, vapor or gas that will ignite easily and burn rapidly.

The flash point is the temperature at which a liquid or solid gives off vapor that can form a flammable mixture with air.

IARC is the International Agency for Research on Cancer, a scientific group that classifies chemicals according to their cancer-causing potential.

A miscible substance is a liquid or gas that will evenly dissolve in another.

mg/m3 means milligrams of a chemical in a cubic meter of air. It is a measure of concentration (weight/volume).

MSHA is the Mine Safety and Health Administration, the federal agency that regulates mining. It also evaluates and approves respirators.

A mutagen is a substance that causes mutations. A mutation is a change in the genetic material in a body cell. Mutations can lead to birth defects, miscarriages, or cancer.

NCI is the National Cancer Institute, a federal agency that determines the cancer-causing potential of chemicals.

NFPA is the National Fire Protection Association. It classifies substances according to their fire and explosion hazard.

NIOSH is the National Institute for Occupational Safety and Health. It tests equipment, evaluates and approves respirators, conducts studies of workplace hazards, and proposes standards to OSHA.

NTP is the National Toxicology Program which tests chemicals and reviews evidence for cancer.

OSHA is the Occupational Safety and Health Administration, which adopts and enforces health and safety standards.

ppm means parts of a substance per million parts of air. It is a measure of concentration by volume in air.

A reactive substance is a solid, liquid or gas that can cause an explosion under certain conditions or on contact with other specific substances.

A teratogen is a substance that causes birth defects by damaging the fetus.

TLV is the Threshold Limit Value, the workplace exposure limit recommended by ACGIH.

The vapor pressure is a measure of how readily a liquid or a solid mixes with air at its surface. A higher vapor pressure indicates a higher concentration of the substance in air and therefore increases the likelihood of breathing it in.

6.0 EMERGENCY INFORMATION

Common Name: CHROMIUM
DOT Number: None
DOT Emergency Guide code: No Citation
CAS Number: 7440-47-3

NEW JERSEY HAZARDOUS SUBSTANCE FACT SHEETS

Topic: CHROMIUM

NJ DOH Hazard rating	
FLAMMABILITY	Not Found
REACTIVITY	Not Found
COMBUSTIBLE DUST CANCER-CAUSING AGENT POWDER MAY EXPLODE IN AIR	

Hazard Rating Key: 0=minimal; 1=slight; 2=moderate; 3=serious; 4=severe

FIRE HAZARDS

* Combustible Dust/Powder.
* POISONOUS GAS IS PRODUCED IN FIRE.
* Powder may explode in air.
* If employees are expected to fight fires, they must be trained and equipped as stated in OSHA 1910.156.

SPILLS AND EMERGENCIES

If Chromium is spilled, take the following steps:

* Restrict persons not wearing protective equipment from area of spill until clean-up is complete.
* Collect powdered material in the most convenient and safe manner and deposit in sealed containers.
* It may be necessary to contain and dispose of Chromium as a HAZARDOUS WASTE. Contact your Department of Environmental Protection (DEP) or your regional office of the federal Environmental Protection Agency (EPA) for specific recommendations.

FOR LARGE SPILLS AND FIRES immediately call your fire department. You can request emergency information from the following:

CHEMTREC: (800) 424-9300
NJDEP HOTLINE: (609) 292-7172 Other:

HANDLING AND STORAGE

* Prior to working with Chromium you should be trained on its proper handling and storage.
* A regulated, marked area should be established where Chromium is handled, used, or stored.
* Chromium must be stored to avoid contact with STRONG OXIDIZERS (such as CHLORINE, BROMINE, and FLUORINE) since violent reactions occur.
* Sources of ignition such as smoking and open flames are prohibited where Chromium is used, handled, or stored in a manner that could create a potential fire or explosion hazard.

FIRST AID

In NJ, POISON INFORMATION 1-800-962-1253 Other:

Eye Contact
* Immediately flush with large amounts of water for at least 15 minutes, occasionally lifting upper and lower lids. Seek medical attention.

Skin Contact
* Remove contaminated clothing. Wash contaminated skin with soap and water.

PHYSICAL DATA

Water Solubility: Insoluble

OTHER NAMES AND FORMULATIONS:

Chrome

NEW JERSEY DEPARTMENT OF HEALTH
Right to Know Program CN 368, Trenton, NJ 08625-0368 (609) 984-2202
