

Wisconsin Mercury Research Laboratory

CHEMICAL HYGIENE PLAN

U.S. Geological Survey

8505 Research Way

Middleton, WI 53562

Submitted to the
Northeastern Region
Water Resources Discipline
U.S. Geological Survey

Prepared by the
U.S. Geological Survey
Water Resources Discipline
Wisconsin Water Science Center

January 2005

Revised September 2008

PROCEDURES IN THE EVENT OF AN ACCIDENT

SPILLS - EVACUATE ALL EXCEPT CONTAINMENT PERSONNEL AND NOTIFY:

- CHEMICAL HYGIENE OFFICER Thomas G. Sabin
EXT. 3884 or HOME PHONE. (608) 661-5677
ADDRESS 2422 Hoard Street Madison, WI 53704
- SAFETY OFFICER Gerald Goddard
EXT. 3841 or HOME PHONE (608) 845-6485
ADDRESS 649 Poplar Lane Verona, WI 53593
- IMMEDIATE SUPERVISOR John F. DeWild
EXT. 3846 or HOME PHONE. (608) 835-1578
ADDRESS 5267 Neatherwood Road Oregon, WI

53575

- MANAGEMENT Chuck P. Dunning
EXT. 3827 or HOME PHONE (608) 238-4598
ADDRESS 5010 Tomahawk Trail Madison, WI 53705

IF YOU CANNOT REACH THE PERSONS ABOVE THEN NOTIFY:

- EMERGENCY - DIAL 911
- USEPA 24-HR HOTLINE (through the U.S. Coast Gaurd)
TEL. NO. 1-800-424-8802

FIRE - IF ALONE EVACUATE AND CALL THOSE BELOW. ELSE, EVACUATE OTHERS EXCEPT CONTAINMENT PERSONNEL WHILE SOMEONE CALLS:

- EMERGENCY - DIAL 911

PERSONNEL ACCIDENT - TREAT PERSON IF YOU ARE QUALIFIED. ELSE KEEP THEM COMFORTABLE AND NOTIFY:

- EMERGENCY - DIAL 911
- NOTIFY: IMMEDIATE SUPERVISOR, CHEMICAL HYGIENE OFFICER, SAFETY OFFICER, MANAGEMENT

EQUIPMENT FAILURE OR LOSS OF UTILITY - STOP OPERATIONS

- NOTIFY: IMMEDIATE SUPERVISOR, CHEMICAL HYGIENE OFFICER, SAFETY OFFICER, MANAGEMENT

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A Chemical Hygiene Plan (CHP) is required (29 CFR 1910.1450) by the Occupational Safety and Health Administration (OSHA) for every laboratory.

The CHP is intended to protect employees from overexposure to hazardous chemicals. As long as a laboratory has a valid CHP in place and employees are not exposed to a chemical above its permissible exposure limit (see definition in exhibit 8), the laboratory is in compliance with the OSHA regulation.

CHEMICAL HYGIENE PLAN

Laboratory covered under this Plan:

Wisconsin Mercury Research Laboratory
U.S. Geological Survey
8505 Research Way
Middleton, WI 53562
(608) 828-9901

Responsible Supervisor: John F. DeWild

Chemical Hygiene Officer: Thomas G. Sabin

Duty Safety Officer: Gerald Goddard

Date: January 2005

Revised: September 2008

Approved by:

Safety Officer, Northeastern Region, WRD

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CHEMICAL HYGIENE PLAN

INTRODUCTION

The Standard Operating Procedure for the Wisconsin Mercury Research Laboratory (SOP-L) also known as the Chemical Hygiene Plan was prepared in compliance with Federal Law (29 CFR 1910.1450). The SOP-L was prepared for your safety and as such it is your responsibility to be aware its contents and to keep current of its updates and revisions. Safety is not to be taken lightly and everyone shares in assuring a safe work environment 24 hours a day.

The terms "at present" and "to date" are used in this document to mean the current version of the SOP-L and updates to be included in the next revision. The SOP-L is revised once a year. To the best knowledge of the Wisconsin Water Science Center (WWSC), this SOP-L and the recommendations contained within are believed to represent up-to-date and reliable information.

The mention of any brand name or use of printed material making specific or non-specific reference to any company name or product does not constitute endorsement of any kind by the U.S. Geological Survey.

For additional safety related information the reader is directed to the following documents:

- Safety and Environmental Health Handbook (USGS 445-2-H, 1993)
- Laboratory Safety Handbook (USGS, 1983)
- Occupational Safety and Health Administration (29 CFR 1910.1450)
- National Institute for Occupational Safety and Health Pocket Guide to Chemical Hazards (NIOSH, 1990)
- Occupational Safety and Health Act of 1970 (Public Law 91-596)
- Middleton Sewer District Wastewater Discharge Regulations
- Wisconsin Water Science Center Emergency Procedures Handbook (WWSC Employee Orientation Guide Chapter 10)

A. Standard Operating Procedures (SOP's) for Handling Hazardous Chemicals

1. Protective apparel and equipment.

It is the individual's responsibility to wear the correct clothing, and use the necessary safety related apparel and equipment. The use of loose fitting clothing or having unconfined long hair is not permitted in the laboratory. The use of open toed shoes or sandals is also not permitted.

In the Material and Safety Data Sheet (MSDS) (exhibit 1) the section entitled "Precaution to be taken in handling and storage" will indicate the appropriate safety apparel and equipment needed for each chemical. Please be sure to familiarize yourself with the MSDS for each of the chemicals you will be using. Chapters 8 and 9 of the Geological Survey's Safety and Environmental Health Handbook (445-1-H) provides guidance for selecting safety equipment. There are no specific specialized safety audible or visual alarms in the laboratory.

- Safety glasses or adequate eye protection may be required. Please be aware of the safety considerations for the particular laboratory operation you perform.
- Contact lenses should not be worn when working with specific chemicals in the laboratory. The employee should be aware of the hazards of their work situation with respect to the type of contacts they wear. If contacts are worn, the employee should seek advice from his/her physician. To avoid complications in case of an accident the supervisor and coworkers should be made aware when an individual finds the use of contacts necessary.
- If noise in the work space will be in excess of 85 decibels hearing protection is required (exhibit 2).
- Use the recommended gloves when handling materials which are hazardous, irritants, or biologically active (exhibit 3).

2. Laboratory practices

Your workspace should be cleaned at regular intervals and before leaving the laboratory. The laboratory and especially areas of high use should be cleaned up once daily.

- Spills must be cleaned up immediately (sect. A.4).
- All work spaces and areas of common access must be free of clutter and waste receptacles emptied before leaving the laboratory.
- Emergency equipment must be readily accessible and free from obstructions.
- Heavy items will be stored lower than head level.

3. Signs and labels.

Emergency telephone numbers are posted by the telephone, on the inside cover of the SOP-L, on the outside and inside of the entrance doors, and on the right side of the hood. Waste receptacles are labeled for glass only or for trash. A combined safety shower and eyewash station is located on the left wall as you enter the laboratory.

The containers of reagents, solutions, and preparations must be clearly and properly labeled, which includes the date received, and the date opened. Containers used to store other than the intended material must be cleaned, its label removed or obscured, and relabeled identifying its current use. Containers must never be cross used with incompatible materials (see 445-1-H, Chap. 8).

4. Spills and accidents.

Spills are to be contained with absorbent materials compatible with the chemical as specified in the appropriate MSDS. Spills within the hood and exhaust failures are discussed in Section C.4. Procedures in case of accidents are addressed in exhibit 4. Accidents are to be reported to the employee's supervisor, properly recorded in Form DI-134, and reported to the regional Bureau safety manager within 5 days. In the event of an accident during the week notify the proper civil authority, immediate supervisor, laboratory officer, and management. If permission has been

obtained to work in the laboratory outside normal working hours and an accident occurs notify the proper civil authority, and as soon as possible contact the immediate supervisor, the Chemical Hygiene Officer, the Safety Officer, and management.

5. Laboratory storage.

There is limited space for the storage of chemicals in the laboratory. The storage areas for flammables and other chemicals are located in the flammable cabinet located in the laboratory storage room across from the main lab. Storage instructions and compatibility of chemicals are explained in the MSDS's and in Chapter 8.1 in 445-1-H.

6. Waste disposal.

For the disposal of waste and the use of sanitary sewer systems for disposal please contact John F. DeWild. For direct information on the use of the sanitary sewer systems (exhibit 5), contact the Middleton Sewer District (608-827-1070).

7. Working alone.

Working alone in the laboratory is allowed if the person has approval from the immediate supervisor and management is informed.

8. Unattended operations.

Laboratory activities requiring water and/or power will cease when any utility is disrupted. An evaluation of the utility disruption will be performed by the immediate supervisor over the activity and the Chemical Hygiene Officer to determine specific action. In the event of an emergency, a list of responsible personnel is found on the inside cover of the SOP-L, on the outside and inside of the entrance doors, on the right side of the hood, and by the telephone.

9. General rules or procedures.

No horseplay, eating, drinking, or smoking will be permitted in the laboratory. Suctioning by mouth for the purpose of preparing serial dilutions or transfer of chemicals is not an acceptable laboratory practice.

B. Criteria to be Used for Implementation of Measures to Reduce Exposures

1. Procurement and distribution.

Before an extremely hazardous substance (e.g., high acute or chronic toxicity, class 1A flammable liquid, highly reactive chemical) is ordered, the supervisor will inform those who will be using the material on proper handling, storage, and disposal. Request a Material Safety Data Sheet (MSDS) each time a different chemical is ordered.

Accept no container without an identifying label. If not in their original shipping containers, chemicals will be transported using a container such as a rubber acid bucket or other suitable device.

All requests for chemical orders will be routed through the Chemical Hygiene Officer. The Chemical Hygiene Officer will check the chemical inventory to ensure that the chemical is not already in stock. In addition he will ensure that proper personal protection equipment and

laboratory safety devices are available for any chemical(s) ordered. The quantity of chemicals ordered should be limited to the amount expected to be used in order to avoid waste disposal/storage problems.

2. Environmental monitoring.

Conduct environmental monitoring when there is any mechanical failure of the exhaust hoods or after any uncontrolled release of a hazardous chemical. The 24-hour telephone contact number for environmental monitoring through the U.S. Environmental Protection Agency is 1-800-424-8802. They in turn will contact the local agency responsible for chemical spills.

3. Chemical inventories.

The Chemical Hygiene Officer will conduct an annual inventory of laboratory chemicals. A copy of the inventory will be maintained by the Chemical Hygiene Officer and a copy will be kept in the laboratory. Copies will be distributed to the regional safety manager. The inventory will include the chemical name, quantity, custodian, and location. The monitoring of chemical expiration dates and the proper disposal of expired chemicals is the responsibility of Chemical Hygiene Officer.

C. Fume Hood Performance

1. Use of laboratory hoods.

The laboratory prep room 72-inch polypropylene hood is rated at 100 linear feet per minute (1170 cubic feet per minute) air flow. It has a two-piece baffle which permits air flow adjustments for a variety of applications. The exhaust is 10 inches in diameter and externally vented by way of a 6-foot, 12-inch diameter, 24-gauge galvanized steel pipe. The hood features a vertical-rising tempered safety glass sash, an explosion-proof blower and light, and automatic by-pass system assuring containment and efficient removal of fumes due to face velocity fluctuations as sash is lowered.

The mercury laboratory 60-inch hood is rated at 100 linear feet per minute (933 cubic feet per minute) air flow. The hoods exhaust is drawn through the bottom grill and making of caustic chemicals in this hood should be avoided. The exhaust is 10 inches in diameter and externally vented by way of a 6-foot, 12-inch diameter, 24-gauge galvanized steel pipe. The hood features a vertical rising Plexiglas sash, and a HEPA filter mounted on the ceiling.

On both hoods, proper hood function requires that the air flow is not obstructed by blocking the bottom of the baffle. The hoods should not be used as storage areas. All equipment used within the hoods shall be secured in some form in order to prevent it being drawn into the exhaust system.

2. Recommended hood face velocity.

Determine hood face velocities no less than once per year. Average face velocities should be between 60 and 100 linear feet per minute (LFM); however, velocities up to 150 LFM are acceptable. Averages are determined by measuring the flow at the face, using no less than 3

uniform quadrants. Record on the hood the average LFM, date, and the initials of the person making the determination. The Regional Safety Manager should be contacted for obtaining the services of a qualified contractor for laboratory hood flow measurements

Hoods with average face velocities of less than 60 LFM will not be used for any toxic chemical. If hood average face velocities exceed 150 LFM, then smoke tubes or equivalent smoke generators will be used to determine if air turbulence exists within the hood. Unacceptable hood performance is when the smoke is thrown back into the breathing zone of the user. When unacceptable turbulence is noted, identify the reason for the turbulence and take steps to improve the hood's performance. If the hoods performance cannot be improved it may be necessary to halt activities requiring its use until it is repaired or replaced.

3. Spills within the hood

If there is an exhaust failure during normal working hours stop operations and notify the immediate supervisor and the Chemical Hygiene Officer. If a chemical spill occurs within the hood contain the material with absorbent materials compatible with the chemical as specified in the appropriate MSDS. If the hood exhaust fails during the spill evacuate all those within the laboratory not essential to the containment and have one person contact the appropriate authority, the immediate supervisor, and the Chemical Hygiene Officer. All contact persons are noted on the right side of the hood.

4. Special ventilation areas

There are no special ventilation areas in the laboratory.

D. Employee Information and Training

1. Frequency of training.

Conduct training on a regular basis, integrating the training into the overall safety program.

Employees using hazardous laboratory equipment or extremely hazardous chemicals will receive specialized training. Present laboratory activities will not require special safety training.

2. Chemical Hygiene Plan.

The SOP-L will be kept in the laboratory on a clipboard mounted above the fire extinguisher, just inside the laboratory entrance. All laboratory workers will be given training on this Chemical Hygiene Plan prior to being given permission to work in the laboratory. Laboratory workers will sign and date the back page of the Chemical Hygiene Plan, stating that they have read and understand the plan.

3. Hazard Communication.

All laboratory workers will receive a minimum of 2 hours of training on the District's Hazard Communication Program before being allowed to work with chemicals.

Training shall include the following at a minimum:

- General hazard classifications.
- Health and physical hazards associated with each hazard classification.

- An explanation of label information.
- Location of MSDS's and chemical inventory lists.
- Explanation of MSDS information.
- Signs and symptoms of chemical exposure.
- Emergency procedures, including first-aid treatment.
- Non-routine hazards.

4. Emergency procedures.

- Conduct annual fire drills and other emergency evacuations.
- See WWSC Emergency Procedures Handbook for the safety and evacuation procedures to be followed in the event of a fire, tornado, or earthquake.

5. Personal Protective Equipment (PPE) and laboratory safety devices.

Discuss specific procedures in effect to provide employee protection, including engineering controls, work practices, and personal protective equipment. Employees required to wear PPE will receive instruction on the proper use, inspection, wearing, cleaning, maintenance, and limitations before wearing such equipment. Employees will also know the location and use of eyewashes, deluge showers, and fire extinguishers. Discuss the operation of any specialized safety devices before allowing the employee to work in the laboratory.

E. Requirements for Prior Approval of Laboratory Activities

The following laboratory activities have been approved.

- Acid washing of mercury laboratory containers/glassware
- Analysis of samples for various species of mercury using purge and trap methods and detection by ICPMS and or CVAFS.

Before an activity is approved an evaluation of the safety implications and laboratory capabilities is required. Participating in the evaluation will be the immediate supervisor, the Chemical Hygiene Officer, and management. Some examples of concern when making an evaluation for approval are:

- Especially dangerous materials known or suspected to be carcinogenic (exhibit 6), mutagenic, or teratogenic.
- Flammable chemicals, irritants, or corrosives.

F. Medical Consultation and Surveillance

The laboratory activities permitted to date (Section E) may not require immunization.

Immunization is mandated if laboratory personnel are to be required to handle samples from known polluted sources such as raw water, landfill leachates, and known sources of biological active contamination.

Seek medical consultation when an employee is exposed to a hazardous chemical due to failure of a laboratory hood or personal protective equipment, spill or other release, or environmental

monitoring has determined the presence of an airborne contaminant above the recommended permissible exposure limit.

When medical consultation is required, provide the physician with specific information on the identity of the chemical, conditions under which the exposure occurred, and a description of the signs and symptoms of exposure. Ask the attending physician to provide a written opinion for recommended follow-up examination and test results; any detected medical conditions of the employee that place the employee at increased risk; and a statement that the employee was informed of the results.

A medical surveillance program will be established for an employee when any employee is exposed to any chemical regulated by the Occupational Safety and Health Administration (exhibit 7) and the employee's exposure was deemed to be above the chemical's permissible exposure limit. For voluntary medical surveillance programs available to employees contact Clyde Sholar, Medical Surveillance Officer at (502) 493-1911.

G. Chemical Hygiene Plan (CHP) Responsibilities

1. Laboratory supervisor.

The laboratory supervisor is assigned and has overall responsibility for chemical safety in the laboratory. The supervisor has the following specific responsibilities, as a minimum:

- (a) Ensures that a CHP is prepared for the laboratory, employees know and follow the Plan, appropriate and proper personal protective equipment is available and used, and training has been conducted.
- (b) Ensures that regular inspections are conducted and that substandard or hazardous acts or conditions are corrected.
- (c) Ensures that good housekeeping practices are in effect and that equipment such as showers and eyewashes are in working order.
- (d) Knows the current legal requirements of regulated chemicals and ensures that hazardous wastes are disposed of properly.

2. Chemical Hygiene Officer.

- (a) Ensures that a chemical inventory is completed annually for those areas assigned.
- (b) Reviews the Chemical Hygiene Plan annually to ensure that the Plan is up to date.
- (c) Assists employees in obtaining Material Safety Data Sheets.
- (d) Identifies all unattended, overnight laboratory operations, reviewing and recommending fail-safe devices or procedures designed to prevent an accident in the event of a component failure.
- (e) Reviews all laboratory accidents involving hazardous materials and recommends steps to prevent recurrence of similar accidents.

3. Laboratory employee.

- (a) Plans and conducts all laboratory operations in accordance with the Chemical Hygiene Plan for the laboratory.

(b) Participates in the completion of the annual chemical inventory.

(c) Practices good personal hygiene when working with hazardous chemicals, using required personal protective equipment.

H. Special Precautions for Work with Particularly Hazardous Substances

None of the chemicals used in the permitted activities will be at concentrations where special procedures are needed. However specific procedures will be required when working with concentrations of chemicals that meet the following: (1) the chemical is an allergen or embryotoxin (e.g., organomercurials, lead compounds, formamide); (2) the chemical has a moderate chronic or a high acute toxicity (e.g., hydrofluoric acid, hydrogen cyanide); or (3) the chemical has a high chronic toxicity (e.g., select carcinogens - see exhibit 6). The supervisor must complete a job hazard analysis for those working with select carcinogens to be filed with the Chemical Hygiene Officer. Any of those particularly hazardous chemicals must be used in designated areas that are clearly marked. Complete a written job hazard analysis and standard operating procedures for each operation that uses any of those substances. Describe decontamination procedures in the event of a spill or other release, as well as the safe removal of the contaminated waste.

I. Safety Data Reference Information

Exhibit 1. Material and Safety Data Sheets (MSDS's)

Exhibit 2. Standards for Noise Level versus Permissible Exposure Time

Exhibit 3. Recommended gloves for handling hazardous, irritant, or biologically active materials

Exhibit 4. Procedures in the Event of an Accident

Exhibit 5. Middleton Sewer District Regulations

Exhibit 6. Select Carcinogens

Exhibit 7. OSHA Regulated Substances

Exhibit 8. Selected Definitions

Exhibit 9. Wisconsin District Emergency Procedures Handbook

EXHIBIT 1
MATERIAL SAFETY DATA SHEETS

acetic acid
acetone
ascorbic acid
chlorine tablets
copper sulfate
EDTA
gold chloride
hydrochloric acid
hydroxyl amine hydrochloride
methanol
methylene chloride
nitric acid
phosphoric acid
potassium biphthalate
potassium bromate
potassium bromide
potassium chloride
potassium hydroxide
soda lime
sodium acetate trihydrate
sodium bicarbonate
sodium borohydride
sodium hydroxide
sodium nitrate
sodium persulfate
sodium tetraethyl borate
stannous chloride
sulfuric acid
zinc acetate

EXHIBIT 2
STANDARDS FOR NOISE LEVEL VERSUS
PERMISSIBLE EXPOSURE TIMES

Noise level dB(A)	Permissible Time in hours per day
80	16
85	8
90	2
100	1
105	1/2
110	1/4
115	1/8

EXHIBIT 3

LIST OF AVAILABLE GLOVES

Disposable vinyl gloves - General purpose

Disposable poly gloves - General purpose

Disposable shoulder length poly gloves - General purpose

Shoulder Length PVC Gloves – Acid Bath

EXHIBIT 4

PROCEDURES IN THE EVENT OF AN ACCIDENT

SPILLS - EVACUATE ALL EXCEPT CONTAINMENT PERSONNEL AND NOTIFY:

- CHEMICAL HYGIENE OFFICER Thomas G. Sabin
EXT. 3884 or HOME PHONE. (608) 661-5677
ADDRESS 2422 Hoard Street Madison, WI 53704

- SAFETY OFFICER Gerald Goddard
EXT. 3841 or HOME PHONE (608) 845-6485
ADDRESS 649 Poplar Lane Verona, WI 53593

- IMMEDIATE SUPERVISOR John F. DeWild
EXT. 3846 or HOME PHONE. (608) 835-1578
ADDRESS 5267 Neatherwood Road Oregon, WI

53575

- MANAGEMENT Chuck P. Dunning
EXT. 3827 or HOME PHONE (608) 238-4598
ADDRESS 5010 Tomahawk Trail Madison, WI 5370

IF YOU CANNOT REACH THE PERSONS ABOVE THEN NOTIFY:

- EMERGENCY - DIAL 911
- USEPA 24-HR HOTLINE (through the U.S. Coast Guard)
TEL. NO. 1-800-424-8802
NOTIFY USEPA (404) 347-3931

FIRE - IF ALONE EVACUATE AND CALL THOSE BELOW. ELSE, EVACUATE OTHERS EXCEPT CONTAINMENT PERSONNEL WHILE SOMEONE CALLS:

- EMERGENCY - DIAL 911

PERSONNEL ACCIDENT - TREAT PERSON IF YOU ARE QUALIFIED. ELSE KEEP THEM COMFORTABLE AND NOTIFY:

- EMERGENCY - DIAL 911
- IMMEDIATE SUPERVISOR
CHEMICAL HYGIENE OFFICER
SAFETY OFFICER
MANAGEMENT

EQUIPMENT FAILURE OR LOSS OF UTILITY - STOP OPERATIONS AND NOTIFY:

- IMMEDIATE SUPERVISOR
CHEMICAL HYGIENE OFFICER
SAFETY OFFICER
MANAGEMENT

EXHIBIT 5

Visit <http://www.madsewer.org/>

EXHIBIT 6

SELECT CARCINOGENS

Acetaldehyde
Acetamide
2-Acetylaminofluorene
Acrylamide
Acrylonitrile
o-Aminoazotoluene
4-Aminobiphenyl
o-Anisidine Hydrochloride
1-Amino-2-methylanthraquinone
Arsenic and Certain Arsenic Compounds (See Chemical's MSDS)
Asbestos
Benzene
Benzidine
Benzotrichloride
Beryllium and Certain Beryllium Compounds (See Chemical's MSDS)
Bis(chloromethyl)ether and Technical Grade
1,3-Butadiene
Cadmium and Certain Cadmium Compounds (See Chemical's MSDS)
Carbon-black extracts
Carbon tetrachloride
Chlorendic Acid
Chlorinated Paraffins (C12, 60% Chlorine)
Chloroform
Chloromethyl Methyl Ether
3-Chloro-2-methylpropene
4-Chloro-o-phenylenediamine
Chromium and Hexavalent Chromium Compounds
C.I. Basic Red 9 Monohydrochloride
Citrus Red No.2
para-Cresidine
Cupferron
Dacarbazine

SELECTED CARCINOGENS - continued

DDT

2,4-Diaminoanisole Sulfate

2,4-Diaminotoluene

1,2-Dibromo-3-chloropropane

1,2-Dibromoethane (EDB)

3,3'-Dichloro-4,4'-diaminodiphenyl ether

1,4-Dichlorobenzene

1,2-Dichloroethane

Dichloromethane (Methylene Chloride)

1,3-Dichloropropane (Technical Grade)

Di(2-ethylhexyl)phthalate

Diepoxybutane

1,2-Diethylhydrazine

Diethyl Sulfate

Diglycidyl Resorcinol Ether

3,3'-Dimethoxybenzidine

4-Dimethylaminoazobenzene

3,3'-Dimethylbenzidine

Dimethylcarbamoyl Chloride

1,1-Dimethylhydrazine

Dimethyl Sulfate

1,4-Dioxane

Direct Black 38

Direct Blue 6

Epichlorohydrin

Ethyl Acrylate

Ethylene Dibromide

Ethylene Oxide

Ethylene Thiourea

Formaldehyde (Gas)

Hexachlorobenzene

Hydrazine and Hydrazine Sulfate

Lead Acetate and Lead Phosphate

Lindane and Other Hexachlorocyclohexane Isomers

Mirex

SELECTED CARCINOGENS - continued

2-Naphthylamine

Nickel and Certain Nickel Compounds (See Chemical's MSDS)

Nitilotriacetic Acid

Nitrofen

Nitrogen Mustard Hydrochloride

2-Nitropropane

N-Nitrosodi-n-butylamine

N-Nitrosodiethanolamine

N-Nitrosodiethylamine

N-Nitrosodimethylamine

Polybrominated Biphenyls

Polychlorinated Biphenyls

Polycyclic Aromatic Hydrocarbons

Benz(a)anthracene

Benzo(b)fluoranthene

Benzo(j)fluoranthene

Benzo(k)fluoranthene

Benzo(a)pyrene

Dibenz(a,h)acridine

Dibenz(a,j)acridine

Dibenz(a,h)anthracene

7H-Dibenzo(c,g)carbazole

Dibenzo(a,e)pyrene

Dibenzo(a,h)pyrene

Dibenzo(a,i)pyrene

Dibenzo(a,l)pyrene

Indeno(1,2,3-cd)pyrene

5-Methylchrysene

Potassium bromate

Propylene Oxide

Reserpine

Selenium Sulfide

Silica, crystalline

Sodium ortho-phenylphenate

Soots, Tars, and Mineral Oils

SELECTED CARCINOGENS - continued

2,3,7,8-Tetrachlorodibenzo-p-dioxin (TCDD)

Tetranitromethane

Thioacetamide

4,4'-Thiodianiline

Thiourea

Thorium Dioxide

Toluene Diisocyanate

o-Toluidine and o-Toluidine Hydrochloride

2,4,6-Trichlorophenol

Trypan blue

Uracil mustard

Urethane

Vinyl Chloride

EXHIBIT 7

LIST OF OSHA REGULATED SUBSTANCES

Asbestos, tremolite, anthophyllite, and actinolite. (1910.1001)

Coal tar pitch volatiles; interpretation of term. (1910.1002)

4-Nitrobiphenyl. (1910.1003)

alpha-Naphthylamine. (1910.1004)

Methyl chloromethyl ether. (1910.1006)

3,3'-Dichlorobenzidine (and its salts) (1910.1007)

bis-Chloromethyl ether. (1910.1008)

Beta-Naphthylamine. (1910.1009)

Benzidine. (1910.1010)

4-Aminodiphenyl. (1910.1011)

Ethyleneimine. (1910.1012)

beta-Propiolactone. (1910.1013)

2-Acetylaminofluorene. (1910.1014)

4-Dimethylaminoazobenzene. (1910.1015)

N-Nitrosodimethylamine. (1910.1016)

Vinyl chloride. (1910.1017)

Inorganic arsenic. (1910.1018)

Lead. (1910.1025)

Benzene. (1910.1028)

Coke oven emissions. (1910.1029)

Cotton dust. (1910.1043)

1,2-dibromo-3-chloropropane. (1910.1044)

Acrylonitrile. (1910.1045)

Ethylene oxide. (1910.1047)

Formaldehyde. (1910.1048)

Asbestos. (1910.1101)

EXHIBIT 8
SELECTED DEFINITIONS

a. Flammable Liquid, Class 1A - Any chemical with a flashpoint below 73 degrees Fahrenheit and a boiling point below 100 degrees Fahrenheit.

b. Flashpoint - The minimum temperature at which a liquid gives off a vapor in sufficient concentration to burn in the presence of any ignition source.

c. Hazardous Chemical - Any chemical that, upon exposure, is known or can reasonably be expected to produce acute or chronic physiological harm.

d. Laboratory - Any workplace where relatively small quantities of chemicals are used in a nonproduction basis, multiple chemical procedures or chemicals are used, and protective practices and equipment are available and in common use to minimize exposure to chemicals.

e. Permissible Exposure Limit (PEL) - The concentration of a chemical that one can be exposed for 8 hours per day, 40 hours per week. (See 29 CFR 1910.1000 for existing PEL's.)

f. Select Carcinogen - Any chemical or substance that is known or reasonably expected to cause cancer in humans as recognized by the National Toxicology Program (Department of Health and Human Services) or the International Agency for Research Cancer Monographs.

I have read and understand the Chemical Hygiene Plan of the Wisconsin District as set forth in the previous pages:

Signature

Date

Signature

Date