CHEMICAL HYGIENE PLAN AND HAZARDOUS MATERIALS SAFETY MANUAL FOR LABORATORIES

This is the Chemical Hygiene Plan specific to the following areas:

Laboratory Name:	
Building/ Room Number(s):	
Supervisor/ Phone Number:	
College/ Department:	_

Emergency Contact Telephone Num	ibers
Fire/ Police/ Ambulance	911(Emergency)
Poison Control	1-800-222-1222
UNE Safety & Security	207-283-0176 (# 366)
UNE Environmental Health & Safety	207-391-3491 (#2488)
UNE	

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UNIVERSITY OF NEW ENGLAND CHEMICAL HYGIENE PLAN AWARENESS CERTIFICATION

UNIVERSITY OF NEW ENGLAND POLICY STATEMENT

It is the policy of University of New England to take every reasonable precaution to provide a work environment that

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PART I

THE OSHA LABORATORY STANDARD

AND

UNIVERSITY OF NEW ENGLAND

CHEMICAL HYGIENE PLAN

THE OSHA LABORATORY STANDARD

The basis for this standard (29 CFR 1910.1450) is a determination by the Occupational Safety and Health Administration (OSHA), after careful review of the complete rule-making record, that laboratories typically differ from industrial operations in their use and handling of hazardous chemicals and that a different approach than that found in OSHA's substance specific health standards is warranted to protect workers. The final standard applies to all laboratories that use hazardous chemicals in accordance with the definitions of laboratory use and laboratory scale provided in the standard.

HAZARDOUS CHEMICALS

The Laboratory Standard defines a hazardous chemical as any element, chemical compound, or mixture of elements and/ or compounds which is a physical or health hazard.

A chemical is a physical hazard if there is scientifically valid evidence that it is a flammable, a

For more efficient implementation of the CHP, department heads should select one or more individuals to serve as coordinators. Department safety and health committees can also assume these responsibilities.

Laboratory supervisors and principal investigators are responsible for chemical hygiene in the laboratory. They must ensure that

- workers know and follow the chemical hygiene rules,
- any necessary Hazard Assessments have been conducted and a written Hazard Assessment

used, a code key or legend must be available in the workplace where it may be found quickly and easily by emergency responders or other interested parties.) Labels should bear a date of receipt and should identify the owner of the material; and

3. Departments must maintain any SDSs that are received with incoming shipments of

- 2. Use of containment devices such as fume hoods or glove boxes;
- 3. Procedures for safe removal of contaminated waste; and
- 4. Decontamination procedures.

CONTROL MEASURES

Whenever employee exposures exceed the action level (or in the absence of an action level, the lower of the PEL or TLV), the department must implement control measures to reduce employee exposure to hazardous chemicals including engineering controls, the use of personal protective equipment and hygiene practices. Exposures to extremely toxic materials, select

SAMPLE: ACETONE SDS, Chemical Hygiene Plan Manual

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PART II

HAZARDOUSMATERIALS

SAFEHANDLING

INFORMATION

SAFE HANDLING OF CHEMICALS

Know the physical and health hazards associated with the chemical(s) you are using. Consider the physical state (gas, liquid, or solid) of the material(s). Consider the process in which you are using the chemical(s), the facilities you have for storage of the materials, and the facilities and equipment you may need to handle an emergency. Know the procedures necessary for safe disposal of the chemicals.

Questions you should consider:

- 1. Is the material flammable, explosive, corrosive, or reactive?
- 2. Is the material toxic, and if so, how can I be exposed to the material (inhalation, skin or eye contact, accidental ingestion, accidental puncture)?
- 3. What kind of ventilation do I need to protect myself? What kind of personal protective equipment (i.e. gloves, respirator, and goggles) do I need to protect myself?
- 4. Will the process generate other toxic compounds, or could it result in a fire, explosion, etc.?
- 5. Are my storage facilities appropriate for the type of materials I will be using? Can I properly segregate incompatible materials?
- 6. What possible accidents can occur and what steps can I take to minimize the likelihood and impact of an accident?
- 7. What are the proper procedures for disposal of the chemical(s)?

Once you evaluate the potential physical and health hazards associated with the chemical(s) and the process, you can design your process and work procedures to minimize or eliminate the hazards.

The following sections provide work procedures and engineering controls which can be used to minimize or eliminate hazards in the laboratory. Additional information on chemical hazards and health hazard control measures can be found in the reference list in Appendix O. If you have any questions about any information in these sections, please contact EH&Sat 207-602-2488.

GENERAL SAFETY GUIDELINES

Know the hazards associated with the materials you are using. Carefully read the label before using a chemical. Review the SDS for any special handling information. In some cases it may be necessary to do additional research. Information provided in this booklet and references listed in Appendix J can help. Contact EH&S (207-602-2488) for assistance with the evaluation of hazards associated with a specific material.

Be prepared for hazardous material emergencies and know what action to take in the event of an emergency. Be certain that necessary supplies and equipment are available for handling small spills of hazardous materials.

Know the location of safety equipment: emergency shower, eye wash, fire extinguisher, fire alarm pull station.

Do not work alone in the laboratory if you are working with hazardous materials.

Limit access to areas where chemicals are used or stored by posting signs and/ or locking doors when areas are unattended. Do not permit children in the laboratory.

Purchase the minimum amount of hazardous materials necesari87 (o) BT 9o 37 (0 4C (m) -5 (um) 4 (t) 52

Promptly clean up spills, using appropriate protective apparel, equipment and procedures. See the "Emergency Response" section of the booklet.

Ensure that adequate storage facilities and containers are provided for hazardous materials. See the "Chemical Storage" section of this booklet.

Ensure that hazardous materials are properly segregated into compatible categories. See the "Chemical Storage" section of this booklet.

For unattended operations, leave lights on, place an appropriate sign on the door, and provide for containment of toxic substances in the event of a utility service failure (e.g., loss of cooling water). Plans to conduct unattended operations should be reviewed with the supervisor, or principal investigator.

generate toxic aerosols, gases or vapors. If it is not possible to do work with the sash height set at the point marked, or if there is no marking on the hood, contact EH&S. In general, the sash height should be set at a level where the operator is shielded to some degree from any explosions or violent reactions which could occur and where optimum air flow dynamics are achieved. Most fume hoods are not intended to be used with the sash fully open.

2. Fume hoods should be equipped with a manometer or other continuous reading monitoring device to indicate adequacy of flow. Learn how to read and interpret this gauge, and check it daily. If the gauge indicates a reduced flow in the hood

• CAUTION - LASER

Such areas and are not to be entered except by authorized users of the facility and those having permission from authorized users. Children are never permitted in restricted access

Splash-proof goggles provide superior protection against dust, flying objects, and splash, spray and mist hazards. They should be the first choice for primary eye protection.

Cover all unprotected skin surfaces. Do not wear open-toe shoes, sandals, shorts, etc. in a chemical laboratory.

Even when there is minimal danger of skin contact with a hazardous substance, lab coats, coveralls, aprons, or protective suits should be used. General categories of contaminants include:

- toxic dusts (e.g. asbestos)
- bacteriological agents
 radioactive materials
- lab chemicals
- radioactive materials

Garments contaminated with hazardous materials should not be taken home by staff for laundering. They should be laundered on-site or by a commercial laundry which has been appraised of potential hazards.

For heavily contaminated work, special attention must be given to sealing all openings in the clothing. Tape can be utilized for this purpose. Caps should be worn to protect hair from contamination.

Exposures to strong acids and acid gases, organic chemicals and strong oxidizing agents, carcinogens, and mutagens require the use of protective equipment that prevents skin

- ° Oxidizers
- ° Perchloric acid
- ° Water-reactive
- ° Air-reactive
- [°] Heat-reactive (require refrigeration)
- [°] Unstable (shock-sensitive, explosive)
- ° Others
- ° Gases:

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MODEL WRITTEN STANDARD OPERATING PROCEDURES SPECIAL PRECAUTIONS FOR WORKING WITH HAZARDOUS CHEMICALS

The Laboratory Standard defines a hazardous chemical as any element, chemical compound, or mixture of elements and/ or compounds which is a physical hazard or a health hazard. The standard also requires the employer to develop the circumstances under which a particular laboratory operation, procedures or activity shall require prior approval

MODEL WRITTEN SOP -- The OSHA Laboratory Standard

MODEL WRITTEN SOP -- The OSHA Laboratory Standard explicitly requires "standard operating procedures relevant to safety and health considerations to be followed when laboratory work involves the use of hazardous chemicals." If the model SOPs in this "Special Precautions" section do not fulfill this requirement, you must amend and append in some manner so as to comply.

Special Precautions for Working with Corrosives: Corrosives are materials which can react with the skin causing burns similar to thermal burns, and/ or which can react with metal causing deterioration of the metal surface. Acids and bases are corrosives. Observe the following special precautions.

- 1. Containers and equipment used for storage and processing of corrosive materials should be corrosion resistant.
- 2. Eye protection and rubber gloves

MODEL WRITTEN SOP -- The OSHA Laboratory Standard explicitly requires "standard operating procedures relevant to safety and health considerations to be followed when laboratory work involves the use of hazardous chemicals." If the model SOPs in this "Special Precautions" section do not fulfill this requirement, you must amend and append in some manner so as to comply.

Special Precautions for Working with Pyrophoric Materials: Pyrophoric materials ignite spontaneously upon contact with air. The flame may or may not be visible. Examples include butyl lithium, silane, and yellow phosphorous. Store and use all pyrophorics in an inert atmosphere.

MODEL WRITTEN SOP --

MODEL WRITTEN SOP -- The OSHA Laboratory Standard explicitly requires "standard operating procedures

Special Precautions for Working with Compressed Gases: Special systems are needed for

Special Precautions for Working with Cryogens:

HEALTH HAZARDS

"Health hazard" refers to chemicals for which there is statistically significant evidence based on at least one study conducted in accordance with established scientific principles that acute or chronic health effects may occur in exposed employees. This term includs MODEL WRITTEN SOP -- The OSHA Laboratory Standard explicitly requires "standard operating procedures relevant to safety and health considerations to be followed when laboratory work involves the use of hazardous chemicals." If the model SOPs in this "Special Precautions"

Special Precautions for Working with Embryotoxins and Reproductive Toxins: Substances that act during pregnancy to cause adverse effects on the fetus are referred to as Embryotoxins. These effects include embryo lethality (death of the fertilized egg, the embryo, or the fetus), malformation (teratologic effects), retard growth, and postnatal functional deficits. Examples include organo-mercurials, lead compounds, and formamide.

Because the period of greatest susceptibility to Embryotoxins is the first 8-12 weeks of pregnancy, which includes a period when a woman may not know she is pregnant, women of child-bearing potential should take care to avoid skin contact with all chemicals. The term "reproductive toxins" is used to describe substances which cause harmful effects on the male or female reproductive system or the developing embryo and fetus. These effects include but are not limited to menstrual irregularity, lowered fertility, testicular atrophy, and birth defects.

- 1. Review each use of Embryotoxinss with the research supervisor and EH&S. Review continuing uses annually or whenever a procedural change is made.
- 2. Label Embryotoxins as follows: EMBRYOTOXIN: READ SPECIFIC PROCEDURES FOR USE.
- 3. Store Embryotoxins and reproductive toxins in unbreakable containers or unbreakable secondary containers in a well ventilated area.
- 4. Guard against spills and splashes. Appropriate safety apparel, especially gloves, should be worn. All hoods, glove boxes, or other essential engineering controls should be known to be operating properly before work is started.
- 5. Notify your supervisor and EH&S of all incidents of exposure or spills. EH&S will arrange for a medical consultation.

Special Precautions for Working with Chemicals of Moderate Chronic or High Acute Toxicity: See Appendix E of this manual for definition and discussion of the meanings of chronic and acute toxicity. Examples of chemicals of moderate chronic toxicity or high acute toxicity include diisopropylfluorophosphate, hydrofluoric acid, and hydrogen cyanide.

1. Consult one of the standard compilations that list toxic properties of known substances

Special Precautions for Working with Chemicals of High Chronic Toxicity: See Appendix E of this manual for definition and discussion of the meanings of chronic and acute toxicity. Examples of chemicals exhibiting high chronic toxicity include dimethylmercury, nickel carbonyl, benzo-a-pyrene, N-nitrosodiethylamine, and other human carcinogens or substances with high carcinogenic potency in animals.

- Conduct all transfers and work in designated (restricted access) areas: a restricted access hood, glove box, or portion of a lab, designated for use of highly toxic substances, for which all persons with access are aware of the substances being used and necessary precautions.
- 2. Protect vacuum pumps against contamination with scrubbers or HEPA filters and vent effluent into the hood.
- 3. Decontaminate vacuum pumps or other contaminated equipment, including glassware, before removing them from the designated area. Decontaminate the designated area before normal work is resumed there.
- 4. On leaving the area, remove protective apparel (placing it in an appropriate, labeled container) and thoroughly wash hands, forearms, face, and neck.
- 5. Use a wet mop or a vacuum cleaner equipped with a HEPA filter to decontaminate surfaces. DO NOT DRY SWEEP SPILLED POWDERS.
- 6. If using toxicologically significant quantities of a substance on a regular basis (in quantities above a few milligrams to a few grams, depending on the substance, 3 or more times per week), contact EH&S. EH&S

Special Precautions for Animal Work with Chemicals of High Chronic Toxicity: See

BIOLOGICAL HAZARDS

Policies and procedures pertaining to biological safety are contained in the "University of New England Biological Safety Manual." Contact the EH&S Environmental Health Section for a copy of this manual.

RADIOACTIVE MATERIAL HAZARDS

Use of radioactive materials at University of New England is strictly controlled. The policies and procedures for handling radioactive materials are contained in the "University of New England Radiation Safety Manual." Contact the EH&S Radiation Safety Section if you are planning on using radioactive materials.

IONIZING AND NON-IONIZING RADIATION HAZARDS

Laser safety, x-ray safety, and all concerns pertaining to the hazards of ionizing and nonionizing radiation are the purview of the EH&S Radiation Safety Officer. Contact them at

TRANSPORTATION OF HAZARDOUS MATERIALS

TRANSPORTATION OVER THE ROAD

Any container of hazardous material transported on a road accessible to or used by the public is subject to the regulation by the U.S. Department of Transportation (DOT). DOT regulations require, in part, that no person may offer or accept a hazardous material for transportation unless the material is properly classified, described, packaged, marked, labeled, manifested, and in condition for shipment. This includes hazardous materials transported between the various University buildings and campuses. DOT regulations require the driver of a vehicle transporting hazardous materials in quantities requiring a placard to possess a Commercial Driver's License. For materials classified as "dangerous by inhalation", there is no exempt quantity. DOT regulations also specify training requirements for any individual who engages in the following activities:

- a. Load, unloads, or handles hazardous materials in transportation;
- b. Reconditions or tests containers, drums, or packages represented for use in the transportation of hazardous materials;

C.

For larger spills, or any spill for which you believe unrecovered mercury might remain, contact the EH&SHazardous Materials Management section for spill clean-up, instructions, or assistance (ext. 2488/ 2791).

INJURY AND ILLNESS

GENERAL

Employees must notify their immediate supervisor of all illnesses and injuries related to exposure to hazardous chemicals. Employees should report all injuries to University Safety & Security if medical attention is required. All injuries and must be reported to the Supervisor. The supervisor and employee must complete an Accident Report within 24 hours of the incident and submitted to Human Resources.

If transportation is necessary, the University Safety and Security (see cover page) should be called to get transportation for the victim.

Do not move a seriously injured person unless he/ she is in further danger.

Do not transport injured person(s) in personal or department vehicles. Call 911 for ambulance transportation.

In cases of serious injury or illness, it is imperative that appropriate actions be followed immediately. When in doubt as to what should be done, telephone the University

APPENDICES

APPENDIX A

University-wide Safety Committee Charter

A primary responsibility of the University-wide Safety Committee is to promote safe and proper chemical management at the Biddeford, Portland, and Tangier Campuses, and related facilities and operations engaged in the laboratory use of hazardous chemicals. Chemical management includes, but is not limited to, the procurement and the safe handling, use, storage, and disposal of chemicals.

The University-wide Safety Committee shall consist of members appointed from the faculty and staff of the major research, teaching, and service areas where chemicals are handled or used. Committee members shall be appointed annually by the President upon recommendation of the Vice President for Research and the Vice President for Campus Services in consultation with the various deans. A list of University-wide Safety Committee members can be found on the UNE EH&S web site. The Chairperson, a member of the faculty, shall also be appointed by the president. Other specific duties and responsibilities of the University-wide Safety Committee also include, but are not limited to, the following:

- 1. Serve as advisor to the University Community on matters related to Environmental Health & Safety management.
- 2. Be cognizant of all applicable government and University policies, procedures, guidelines, laws and regulations related to Environmental Health & Safety management and transmit this information in appropriate form to the University Community.
- 3. Develop, review, and/or approve procedures and guidelines, and prescribe special conditions, requirements, and/or restrictions related to Environmental Health & Safety management.
- 4. Recommend to the Colleges and Departments appropriate policies related to Environmental Health & Safety management.
- 5. Develop, review, approve, and recommend programs of training in Environmental Health & Safety management for the University Community.
- 6. Review conditions not in compliance with government and/or University policies, procedures, guidelines and regulations, and recommend appropriate corrective actions. In extreme circumstances, this may include suspension of the activity in guestion.
- 7. Keep a written record of activities, actions, decisions and recommendations of the Committee.
- 8. Submit to the University Board of Trustees, through appropriate channels, an annual report detailing the activities of the Committee.

The Committee is convened monthly (except for June, July, and August) and administered through the Department of Environmental Health & Safety. The Director of Environmental Health & Safety serves as the Safety Committee Chair and shall conduct the interim business of the Committee subject to review by the Committee at subsequent meetings.

The UNE Department of Environmental Health & Safety has the responsibility for ensuring compliance with all government and University policies, procedures, guidelines, laws and regulations related to Environmental Health & Safety management and will advise and assist the Committee in areas related to Environmental Health & Safety management.

with, all government and University policies, procedures, guidelines, laws and regulations related to chemical management. Individual faculty members and supervisors shall ensure that Environmental Health & Safety management requirements are understood and followed by their subordinates, including technicians, undergraduates, graduate students, and post doctorates fellows.

APPENDIX B

Incompatible Chemicals

Certain chemicals should not be stored (and cannot be easily/safely mixed) with certain other chemicals due to severe exothermicity of reaction or uncontrolled production of a toxic product. In the event of earth tremor or other unexpected breakage, especially during fire, the consequences of proximal storage of incompatible materials can be fatal to staff, fire fighters, and other emergency responders. The following list contains examples of incompatibilities. The list should not be considered complete. For complete information about a specific chemical, always consult at least one current Safety Data Sheet.

ļ

A cetic acid

aldehyde, bases, carbonates, hydroxides, metals, oxidizers, peroxides, phosphates, xylene, chromic acid, nitric acid, hydroxyl compounds, ethylene glycol,

peroxide	
Cyanides	acids, alkaloids, aluminum, iodine, oxidizers, strong bases
Flammableliquids	ammonium nitrate, chromic acid, hydrogen peroxide, nitric acid, sodium
	peroxide, halogens, oxygen, oxidizers in general
Fluorine	All other chemicals
Hydrocarbons (liq	see flammable liquids
and gas)	
Hydrocyanic acid	nitric acid, alkali
Hydrofluoric acid	metals, organic materials, plastics, silica (glass, including fiberglass),
	sodium, ammonia
Hydrogen peroxide	all organics, nitric acid, phosphorous, sulfuric acid, sodium, most metals or
	their salts

APPENDIX D Shock-Sensitive Materials The following are examples of materials which can be shock-sensitive:

acetylides		
aluminum ophorite explosive		
amatol		
ammonal		
ammonium nitrate		
ammonium perchlorate		
ammonium picrate		

APPENDIX E -

Cumulative poisons are characterized by materials that tend to build up in the body as a result of numerous chronic exposures. The effects are not seen until a critical body burden is reached. Examples are heavy metals.

Substances in combination, meaning two or more hazardous materials present at the same time whose resulting effect is greater than the effect predicted based on the individual substances. This combined effect is called a synergistic or potentiating effect. An example is exposure to alcohol and chlorinated solvents.

Other Factors Affecting Toxicity

- Rate of entry and route of exposure; that is, how fast the toxic dose is delivered and by what means.
- Age can affect the capacity to repair tissue damaged.
- Previous exposure can lead to tolerance, increased sensitivity, or make no difference.
- State of health, medications, physical condition, and life style can affect the toxic response. Pre-existing disease can result in increased sensitivity.
- Environmental factors, such as temperature and pressure.
- Host factors, including genetic predisposition and the sex of the exposed individual.

Physical Classifications of Toxic Materials

Gas applies to a substance which is in the gaseous state at room temperature and pressure.

A vapor is the gaseous phase of a material which is ordinarily a solid or a liquid at room temperature and pressure.

When considering the toxicity of gases and vapors, the solubility of the substance is a key factor. Highly soluble materials like ammonia irritate the upper respiratory tract. On the other hand, relatively insoluble materials like nitrogen dioxide penetrate deep into the lung. Fat soluble materials, like pesticides, tend to have longer residence times in th (e) -11 (a.) 2 (e) (e ((e (e () 32)))

Long term exposure to irritants can result in increased mucous secretions and chronic bronchitis.

A primary irritant exerts no systemic toxic action either because the products formed on the tissue of the respiratory tract are non-toxic or because the irritant action is far in excess of any systemic toxic action. Example: hydrogen chloride.

A secondary irritant's effect on mucous membranes is over-

- alpha-napthylamine 3,3'-dichlorobenzidine
- N-nitrosodimethylamine
- inorganic arsenic
- 4-nitrobiphenyl
- methyl chloromethyl ether

•

Example chemicals:	ketone, chlorinated compounds, alcohols, nickel, phenol,	
	trichloroethylene.	

• Eye hazards affect the eye or vision

Signs and symptoms:conjunctivitis, corneal damage.Example chemicals:organic solvents, acids, cresol, quinone, hydroquinone,
benzyl chloride, butyl alcohol, bases.

APPENDIX F

#M76@B5L<(O7YR@@.K(17<@K:5?7>(-J75<8((!7L7B?(#5JB@;K7:<D(O7=J;>RB?@K7(\$;Q@.<D(5:>((!R]<?5:B7<(I_M@BM(+5X7(5(+@KM(17KJ77(;A(-BR?7(\$;Q@B@9(T Anabolic steroids (androgenic steroids) Analgesic mixtures containing phenacetin Angiotensin converting enzyme (ACE) inhibitors

Gyromitrin (Acetaldehyde methylformylhydrazone)	[16568-02-8]
Halazepam	[23092-17-3]
Halothane	[151-67-7]
HC Blue No. 1	[2784-94-3]
Heptachlor	[76-44-8]
Heptachlor epoxide	[1024-57-3]
Hexachlorobenzene (benzene hexachloride, C6Cl6)	[118

Nitrilotriacetic acid salts	
Nitrilotriacetic acid, trisodium salt monohydrate	[18662-53-8]
Nitrobenzene	[98-95-3]
Nitrofurantoin	[67-20-9]
Nitrofurazone	[59-87-0]
Nitrogen Dioxide	[10102-44-0]
Nitrogen mustard (N,N-bis(2-chloroethyl)methylamine,	[51-75-2]
nitrogen mustard hydrochloride (Mechloroethamine	[55-86-7]
Nitrogen mustard N-oxide	[126-85-2]
Nitrogen mustard N-oxide hydrochloride (2-chloro-N-(2-	

APPENDIX G Chemical Resistance Examples

	1	2	3	4
*Acetaldehyde	VG	G	VG	G
Acetic acid	VG	VG	VG	VG
*Acetone	G	VG	VG	Р
Ammonium hydroxide	VG	VG	VG	VG
*Amyl acetate	F	Р	F	Р
Aniline	G	F	F	Р
*Benzaldehyde	F	F	G	G
*Benzene	Р	Р	Р	F
Butyl acetate	G	F	F	Р
Butyl alcohol	VG	VG	VG	VG
Carbon disulfide	F	F	F	F
*Carbon tetrachloride	F	Р	Р	G
*Chlorobenzene	F	Р	F	Р
*Chloroform	G	Р	Р	E

APPENDIX H Glossary

ACGIH - The American Conference of Governmental Industrial Hygienists is a voluntary membership organization of professional industrial hygiene personnel in governmental or educational institutions. The ACGIH develops and publishes recommended occupational exposure limits each year called Threshold Limit Values (TLVs) for hundreds of chemicals, physical agents, and biological exposure indices.

ACUTE - Severe, often dangerous, conditions in which relatively rapid changes occur.

ACUTE EXPOS240 9240 9240 921 ((r) 2 (a)2 ()Gr) 123 60.36m BT 400 400 Tm /TT51 Tf () Tj ET Q q 0.24

CHEMICAL FAMILY - A group of single elements or compounds with a common general name. Example: acetone, methyl ethyl ketone (MEK), and methyl isobutyl ketone (MIBK) are of the "ketone" family; acrolein, furfural and acetaldehyde are of the "aldehyde" family.

CHEMICAL HYGIENE OFFICER - An employee who is designated by the employer and who is qualified by training or experience to provide technical guidance in the development and implementation of the provisions of the Chemical Hygiene Plan.

CHEMICAL HYGIENE PLAN - A written program developed and implemented by the employer which sets forth procedures, equipment, personal protective equipment, and work practices that (1) are capable of protecting employees from the health hazards presented by hazardous chemicals used in that particular workplace and (2) meets the requirements of OSHA regulation 29 CFR 1910.1450.

CHEMICAL MANUFACTURER - An employer in SIC Codes 20 through 39 with a workplace where chemicals are produced for user or distribution.

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

CHEMICAL REACTION - A change in the arrangement of atoms or molecules to yield substances of different composition and properties. (See Reactivity)

CHRONIC - Persistent, prolonged or repeated conditions.

CHRONIC EXPOSURE - A prolonged exposure occurring over a period of days, weeks, or years.

COMBUSTIBLE LIQUID - Any liquid having a flashpoint at or above 100°F (37.8°C) but below 200°F (93.3°C) except any mixture having components with flashpoints of 200°F or higher, the total volume of which make up 99% or more of the total volume of the mixture. COMMON NAME -

DESIGNATED AREA - An area which has been established and posted with signage for work involving hazards, e.g. "select carcinogens," reproductive toxins, or substances which have a high degree of acute toxicity. A designated area may be the entire laboratory, an area of a laboratory, or a device such as a laboratory hood.

DILUTION VENTILATION - See General Ventilation.

DOT - The United States Department of Transportation is the federal agency that regulates the labeling and transportation of hazardous materials.

DUSTS - Dusts are solid particles generated by handling, crushing, grinding or rapid impact of organic and inorganic materials such as rock, metal, coal, wood, and grain. Dust is a term to describe airborne solid particles that range in size from 0.1 to 25 micrometers.

DYSPNEA - Shortness of breath; difficult or labored breathing.

EMPLOYEE - An individual employed in a laboratory workplace who may be exposed to hazardous chemicals in the course of his or her assignments. The term "employee" includes students, visiting professors and scholars, trainees, and other individuals who are subject to the same exposures or working conditions as employees.

EMPLOYER - The employer, for purposes of this document, means University of New England.

EPA - U.S. Environmental Protection Agency; federal agency with environmental protection regulatory and enforcement authority. Administers Clean Air Act, Clean Water Act, FIFRA, RCRA, TSCA, and other Federal Environmental Laws.

EPA NUMBER - The number assigned to chemicals regulated by the Environmental Protection Agency (EPA).

EPIDEMIOLOGY - The study of disease in human populations.

ERYTHEMA - A reddening of the skin.

EVAPORATION RATE - The rate at which a material is converted to vapor (evaporates) at a given temperature and pressure when compared to the evaporation rate of a given substance. Health and fire hazard evaluations of materials involve consideration of evaporation rates as one aspect of the evaluation.

EXPLOSIVE - A chemical that causes a sudden, almost instantaneous release of pressure, gas,

APPENDIX H -

HAZARD WARNING - Any words, pictures, symbols or combination thereof appearing on a label or other appropriate form of warning which convey the hazards of the chemical(s) in the container(s).

HAZARDOUS MATERIAL - Any material which is a potential/actual physical or health hazard to humans.

HAZARDOUS MATERIAL (DOT)

APPENDIX

MELTING POINT - The temperature at which a solid changes to a liquid. A melting range may be given for mixtures.

mg-See Milligram.

mg/kg - See Milligrams Per Kilogram.

mg/m³ - See Milligrams Per Cubic Meter.

MILLIGRAM (mg) - A unit of weight in the metric system. One thousand milligrams equal one gram.

MILLIGRAMS PER CUBIC METER (mg/m³) - Units used to measure air concentrations of dusts, gases, mists, and fumes.

MILLIGRAMS PER KILOGRAM (mg/kg) - This indicates the dose of a substance given to test animals in toxicity studies. For example, a dose may be 2 milligrams (of substance) per kilogram of body weight (of the experimental animal).

MILLILITER (ml) - A metric unit used to measure volume. One milliliter equals one cubic centimeter. One thousand milliliters equal one liter.

MIST - Small suspended droplets of liquid generated by condensation of liquids from the vapor back to the liquid state or by breaking up a liquid into a dispersed state, such as by splashing. Some examples are paint spray mist in painting operations and the condensation of water to form a fog or rain.

MIXTURE - Any combination of two or more chemicals if the combination is not, in whole or in part, the result of a chemical reaction.

ml - See Milliliter.

MSHA - The Mine Safety Health Administration; a federal agency that regulates the mining industry in the safety and health area.

MUTAGEN - Anything that can cause a change (or mutation) in the genetic material of a living cell.

NARCOSIS - Stupor or unconsciousness caused by exposure to a chemical.

NATIONAL TOXICOLOGY PROGRAM (NTP) - A collaborative program including the National Institute of Environmental Health Sciences (NIH/NIEHS), the Centers for Disease Control and Prevention's National Institute for Occupational Safety and Health (CDC/ NIOSH), and the Food and Drug Administration's National Center for Toxicological Research (FDA/NCTR). Classifications published by the <u>Report On Carcinogens</u> are used by OSHA regulations as part of the definition of "select carcinogen."

NFPA - The National Fire Protection Association; a voluntary membership organization whose aims are to promote and improve fire protection and prevention. NFPA has published 16 volumes of codes known as the National Fire Codes. Within these codes is Standard No. 705, "Identification of the Fire Hazards of Materials". This is a system that rates the hazard of a material during a fire. These hazards are divided into health, flammability, and reactivity hazards and appear in a well-known diamond system using from zero through four to indicate severity of the hazard. Zero indicates no special hazard and four indicates severe hazard.

NIOSH - The National Institute for Occupational Safety and Health; auederald agecy tatd

ORAL - Having to do with the mouth ORGANIC PEROXIDE - An organic com

studies when they exist. There are three different types of TLVs: Time-Weighted Average (TLV-TWA), Short-Term Exposure Limit (TLV-STEL), and Ceiling (TLV-C). (See also PEL). TIME-

APPENDIX I

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A standardized Laboratory door information label/ signage for use University-wide is under development at this current time.

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