c. Provide adequate ventilation The best way to prevent exposure to airborne substances is to prevent their escape into the working atmosphere by use of hoods and other ventilation devices.
d. Institute a chemical hygiene program A mandatory chemical hygiene program designed to minimize exposures is needed; it should be a regular, continuing effort, not merely a standby or short term activity. Its recommendations should be followed in academic teaching laboratories as well as by full-time laboratory workers.
e. Observe the PELs, TLVs The Permissible Exposure Limits of OSHA and the Threshold Limit Values of the American Conference of Governmental Industrial Hygienists should not be exceeded.

4. General Program Management
   a. Deans, Directors, Department Chairs, Principal Investigators, Managers and Supervisors are responsible for maintaining safe operations in their labs on a daily basis. Specific responsibilities include:
      i. Ensure that the requirements of the Chemical Hygiene Plan are followed in their areas.
      ii. Attend a laboratory safety meeting in their responsible area at least once each year.
      iii. Assure that adequate safety resources are available to laboratory personnel.
   b. Environmental health and Safety (EHS) is responsible for providing overall coordination for the Chemical Hygiene Plan (CHP). Specific responsibilities of EHS include:
      i. Provide initial training for managers, supervisors, and safety coordinators concerning requirements of the program and their responsibilities.
      ii. Provide guidance for the preparation of procedures, chemical inventories, and

ii. Provide written standard operating procedures for specific laboratory procedures.
iii. Ensure employee training at the time of initial assignment to the area, whenever a new hazard is introduced to the area or when the employee is reassigned to an area using new or different materials and/or processes.
iv. Provide appropriate personal protective equipment and require its proper use and maintenance.
v. Ensure an inventory is completed for all chemicals used in their work areas.
vi. Review and understand Safety Data Sheets (SDSs) on materials used by employees under their direct supervision and inform employees as new SDSs become available.
vii. Ensure SDS files are available in the work area and are readily accessible to employees.
viii. Ensure that employees requests for SDSs and other materials are promptly handled, requesting any necessary information or help from EHS.
ix. Ensure that all containers of hazardous materials are labeled with chemical name or trade name.
x. Prepare a hazard analysis to identify each hazard, and to assure that protective equipment, procedures and emergency response plans are adequate for each hazard, and for the maximum credible emergency event.

d. A Laboratory Safety Coordinator (LSC) will be designated for each school, department, or other subdivision by the dean, chairman, or director ro serve as liaison to EHS and the CHO. Responsibilities of the LSC include:
i. Ensure that training is documented using the an attendance record. Send a copy of the record to EHS.
ii. Provide information about chemical hazards to contract employees or LSU maintenance employees working in the areas.
iii. Serve as a conduit for information between laboratories in their area and EHS and the CHO.
iv. Assist the CHO in inspections and other duties as available and as assigned.

e. Laboratory Workers responsibilities include the following:
i. tandards and rules.
ii. Develop good personal hygiene habits.
iii. Report all hazardous conditions to the supervisor.
iv. Wear or use prescribed protective equipment.
v. Refrain from operating equipment without proper training or equipment that has safety defects.
vi. Attended training sessions on the Chemical Hygiene Program.
vii. Keep informed about chemicals used in the lab.

5. <u>Basic Rules and Procedures for Working with Chemicals</u>
a. General Rules are fundamental safety precautions which should be familiar to all lab users. These practice should be followed at all times.

i. Accidents and spills.
   1)

      web page.
   2) Eye contact: promptly flush eyes with water for a prolonged period (15 minutes) and seek medical attention.
   3) Ingestion: Consult SDS.
   4) Skin contact: Consult SDS.
   5) Clean-up: Promptly clean up spills using appropriate protective apparel and equipment and proper disposal. See LSU Safety Manual section on spills and cleanup for guidance and requirements on notifying EHS.
   6) All significant accidents should be carefully analyzed with the assistance of EHS and the results distributed to those who might benefit.

ii. Avoidance of routine exposure. Each laboratory employee with the training, education and resources provided by supervision, shall develop and implement work habits consistent with this CHP to minimize personal and co-worker exposure to the chemicals in the laboratory. Based on the realization that all chemicals inherently present hazards in certain conditions, exposure to all chemicals shall be minimized. General precautions which shall be followed for the handling and use of all chemicals include:
   1) Skin contact with all chemicals shall be avoided.
   2) All employees shall wash all areas of exposed skin prior to leaving the laboratory.
   3) Mouth suction for pipetting or starting a siphon is prohibited.
   4) Eating, drinking, smoking, gum chewing, or application of cosmetics in areas where laboratory chemicals are present shall be prohibited.
   5) Storage, handling and consumption of food or beverages shall not occur in chemical storage areas or refrigerators. Glassware and utensils used for laboratory operations shall not be used for food or drink consumption or preparation.

iii. Laboratory Equipment and Glot42 Tf9(posure)6(. Ea)5(c)4(h l)-11(a)4rg6k2 248.21 Tm0 g0 G[ )]T

4) All laboratory equipment shall be inspected by the user on a periodic basis for safety defects, and replaced or repaired as necessary.

iv. Personal Protection Apparel

1) Safety glasses meeting ANSI Z87.1 are required for employees and visitors in laboratories so designated, and will be worn at all time when in the laboratory. Glasses do not provide protection from chemical splashes.
2) Chemical goggles and a full face shield (if necessary) shall be worn during chemical transfer and handling operations as procedures dictate.
3) Sandals, open toed shoes, and bare feet should be prohibited.
4) Lab coats provide adequate body protection for most operations in the

4) Safety showers are to be available in all laboratories where chemicals are handled. Every laboratory worker should know where the showers are and be trained in its use.
5) Eyewash fountains must be available in the laboratories to provide a continuous soft stream of water for 15 minutes. The fountains should be located close to the safety showers so that the eyes can be washed while the body is showered if necessary.

vi. Personal Work Practices
1) All employees shall be alert for unsafe practice and conditions in the laboratory and shall immediately report such practices and/or conditions to the laboratory supervisor. The supervisor must correct unsafe practices and/or conditions promptly.
2) Long hair and loose-fitting clothing shall be confined close to the body to avoid being caught in moving machine/equipment parts.
3) Use only those chemicals appropriate for the ventilation system.
4) Avoid unnecessary exposure to all chemicals by any route.
5) Do not smell or taste any chemicals
6) Avoid working alone in the laboratory. When working alone in the laboratory arrange for periodic checks by personnel in adjacent laboratories.
7) Avoid practical jokes or other behavior which might confuse, startle or distract another worker.
8) Wash areas of exposed skin well before leaving the laboratory.
9) Keep work area clean and uncluttered, with chemicals and equipment being properly stored. Clean up the work area on completion of an operation or at the end of each day.
10) Planning: Seek information and advice about hazards, plan appropriate protective procedures, and plan positioning of equipment before beginning any new operation.
11) Use of hood: Use the hood for operations which might result in the release of toxic chemical vapors or dust. See section on engineering controls.

b. Working with Allergens and Embryotoxins.
i. Wear suitable gloves to prevent hand contact with allergens or substances of unknown allergenic activity. Latex gloves are to be avoided due to allergenic properties and are generally not recommended for any chemical exposure unless

particular chemical.
ii. If you are a woman of childbearing age, be particularly cautious when handling substances known to be embryotoxins (examples: organomercurials, lead compounds, formamide). Contact the research supervisor or EHS to verify adequacy of controls.

c. Special Procedures for Highly Hazardous Substances. Special precautions shall be taken when performing laboratory work with any of the following chemical categories:

carcinogens, reproductive toxins, substances that have a high degree of acute toxicity, or chemicals who toxic properties are unknown.

i. Chemical Categories

Carcinogens Both known and suspect cancer causing chemicals reported in the

Reproductive Toxins Chemicals including mutagens and teratogens identified as such by the manufacturer Safety Data Sheet (SDS).

Acute Toxicity Chemicals Any substance for which the LSD50 data described in the applicable SDS (or other literature source) cause the substance to be classified as a level 3 or 4 health hazard according to the HMIS system.

Chemicals Whose Toxic Properties are Unknown Chemicals for which there is no known statistically significant study conducted in accordance with established scientific principles that establishes its toxicity.

ii. Precautions for Use

1) Allow only those persons specifically trained to work with highly hazardous chemicals to work with those chemicals.
2) Designated Area A hood, glove box, portion of a laboratory, or an entire laboratory must be designated for high hazard use.
3) Designated areas shall be posted and their boundaries clearly marked. Posting shall include the identification of the highly hazardous chemicals used in the area.
4) Access to the laboratory should be restricted during high hazard chemical use by the laboratory supervisor.
5) Suitable gloves and long sleeves shall be worn during use of high hazardous chemicals.
6) Use the smallest amount of chemical that is consistent with the requirements of the work to be done.
7) Use high-efficiency particulate air (HEPA) filters or high-efficiency scrubber systems to protect vacuum lines and pumps.
8) Decontaminate a designated area when work is completed.

d. Animal Work with Chemicals of High Chronic Toxicity

i. Access: For large scale studies, special facilities with restricted access are preferable.
ii. Administration of the toxic substance: When possible, administer the substance by injection or gavage instead of in the diet. If administration is in the diet, use a caging system under negative pressure or under laminar air flow directed toward HEPA filters.

iii. Aerosol suppression: Devise procedures which minimize formation and dispersal of contaminated aerosols, including those from food, urine, and feces (e.g. use

6) Tubing for running water must be in good condition and secured at connections by clamps or wire.

6. Chemical Procurement, Distribution, And Storage
   a. Procurement.

8. Housekeeping, Maintenance, And Inspections.

   Each laboratorEach laboratorEach laboratora31 0 0 1 22re

All chemicals shall be disposed of in accordance with the LSU Hazardous Waste Disposal Program, the details of which can be found on the EHS web site.

13. Engineering Controls
    a. Intent. The engineering controls installed in the laboratory are intended to minimize employee exposure to chemical and physical hazards in the workplace. These controls must be maintained in proper working order for this goal to be realized.
    b.

are generally made of double-