ANOKA-RAMSEY COMMUNITY COLLEGE

Chemical Hygiene Plan

Program Administrator(s):

Deans, Educational Services — **Melissa Mills**
(Cambridge/Coon Rapids Campus - Science)
763.433.1332

Health & Safety Officer — **Edward Wilberg**
763.433.1685

Chemical Hygiene Officer — **Daniel Harmon**
763.433.1813

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ANOKA-RAMSEY COMMUNITY COLLEGE
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SECTION **PAGE**

1.0 PURPOSE

This Chemical Hygiene Plan (CHP) sets forth policies, procedures, equipment, personal protective equipment and work practices that are capable of protecting employees and students from the health hazards presented by hazardous chemicals used in laboratories. This plan is intended to meet the requirements of 29 CFR 910.1450, Occupational Exposure to Hazardous Chemicals in Laboratories.

2.0 SCOPE

This CHP applies to our Science Laboratories where employees work with substances in which the containers are used for reactions; one person easily and safely manipulates transfers and other handling of substances. The objective of this program is to provide guidance to all laboratory personnel who use chemicals, so that they can perform their work safely.

Laboratory Employees – Each individual working in a laboratory should be informed about hazards associated with that laboratory and the specific work going on there. This includes all staff, students and assistants.

Support Personnel – Storeroom, janitorial, maintenance and delivery personnel may be exposed to potential physical and chemical hazards from work carried out in the laboratory. They must be informed about the risks involved and trained how to avoid potential hazards.

3.0 RESPONSIBILITIES

A. Physical Plant Director

Roger Freeman has the ultimate responsibility for chemical hygiene in physical plant applications throughout the college and, with assistance of other program administrators, will provide continued staff and fiscal support for chemical hygiene.

B. Chemical Hygiene Officer

Daniel Harmon has been selected as the Chemical Hygiene Officer (CHO) for the Chemical Hygiene Plan at Anoka-Ramsey Community College, and will provide continued direction, in consultation with other college laboratory assistants for the Chemical Hygiene Program. The Chemical Hygiene Officer shall:

- work with administrators and other faculty to develop and implement acceptable, appropriate chemical hygiene policies and practices,

- monitor procurement and use of chemicals in the lab; determining that laboratory facilities and training levels are adequate for chemicals in use,

- perform regular, formal chemical hygiene and housekeeping inspections that include inspections of emergency and safety equipment,

- maintain a current chemical inventory of science chemicals present within the ARCC property,

- manage all college hazardous and universal waste inventories and documentation

- review and improve the Chemical Hygiene Plan on an annual basis,

- perform disposal and documentation of all college hazardous waste and key universal waste streams

- perform weekly inspections to all chemical and universal waste storage and accumulation areas

- maintain overall responsibility for the safe operation of the Chemistry, Biology and Physics Laboratories,

- ensure that workers / students know and follow the chemical hygiene rules,

- determine the proper level of personal protective equipment; ensure that such protective equipment is available and in working order,

- ensure that appropriate training has been provided to employees,

- will attend extra training as needed or desired to continue professional development

- monitor the waste disposal program, including manifests by college laboratory assistants, with copies to the Health and Safety Officer,

- develop a system of documentation for all regular inspections and monitoring required under this Chemical Hygiene Plan,

- make an annual report to the Safety Committee concerning implementation of the Chemical Hygiene Plan, including any recommendations for changes in the Chemical Hygiene Plan.

- Provide support, mentoring, and direction to the CHO at Anoka Technical College.

C. <u>Faculty</u>

Have the ultimate responsibility for chemical hygiene in all classrooms and laboratories throughout the college. Faculty is required to ensure that provisions of the CHP are being followed.

D. College Laboratory Assistants (C.L.A.):
See attachment "A" for responsibilities

Chemistry: Nicol Gorostiaga Salgado (Coon Rapids Campus)

Biology: Jayne Fox, Anissa Bekka (Coon Rapids Campus)
Dan Harmon (Cambridge Campus)

Fine Arts: Erick Wiger, Jessica Shimek (Coon Rapids Campus)

Nursing: Pat Giese, Connie Strait (Cambridge and Coon Rapids Campus)

Pharm-Tech: Shelly Lustig (Cambridge Campus)

E. Students

Students are responsible for conducting each operation in accordance with prescribed chemical hygiene procedures and course materials. Students will be given Right-to-Know (RTK) training at the beginning of each semester.

4.0 STANDARD OPERATING PROCEDURES FOR LABORATORY CHEMICALS

A. Chemical Procurement

The decision to procure a chemical shall be completed by the CLA at the request of a faculty member. A commitment of safe handling and use of the chemical from initial receipt to ultimate disposal will always be adhered to.

ARCC practice is to aggressively and continually evaluate current inventory and properly dispose of unnecessary materials.

Requests for procurement of a never before used chemicals shall be submitted to the CHO. An MSDS shall be included with the request to insure that the chemical can be stored, handled, and disposed of in compliance with the CHP

Information on proper handling, storage and disposal shall be identified prior to procurement of a chemical. If, upon investigation, the chemical is either extremely hazardous (e.g., dangerous to life or health resulting from electrical shock, explosion, implosion, etc.), or difficult to dispose of, the CHO shall inform the faculty member and contribute to efforts to determine acceptable alternative pedagogy.

In addition, chemicals used in the laboratory shall be those which are appropriate for the hoods installed in that laboratory, according to published EPA standards.

All chemicals must be received in a central location at each campus. Administrative personnel who receive chemical shipments shall be required to attend training on proper procedures for receipt.

When chemicals are received in the college, the CLA will be notified for pick-up.

Instructors or the CLA will transport the materials to the Chemical Storage area.

Chemical containers shall not be accepted without accompanying labels, material safety data sheets and packaging in accordance with the college's practice. All chemical shipments should be dated when received and opened. All potential donated chemicals must be approved by the CHO before arrival to the college.

B. Chemical Storage

Received chemicals shall be immediately moved to the area designated by the CHO, one of the Instructors, or CLA's. Large glass containers shall either remain in their original shipping container or be placed in carrying containers (e.g., rubber "boots") during transportation.

The storage area shall be well illuminated, with storage maintained at or below eye level [defined by the Association of Industrial Hygienists as at shelf height of no more than five feet]. Large bottles (e.g., gallon) shall be stored in the designated flammable storage cabinet in chemical storage area.

Chemicals should be segregated by hazard classification and compatibility in a well identified area, with good general exhaust ventilation.

Mineral acids should be segregated from flammable and combustible materials. Separation is defined by NFPA 49 as storage within the same fire area but separated by as much space as practicable or by intervening storage from incompatible materials.

Nitric acid will be stored in a separate acid cabinet.

Known poisons such as sodium fluoride or pure caffeine will be stored in separate cabinets.

Acid resistant trays shall be stored in a separate acid cabinet.

Acid sensitive materials, such as cyanides and sulfides, shall be separated from acids or protected from contact with acids and water.

Highly toxic chemicals [e.g., gases and cyanide which are dangerous to life and health] or other chemicals whose containers have been compromised shall be stored in unbreakable secondary containers and labeled.

Storage of chemicals at the lab bench or other work areas shall be limited to those amounts necessary for one operation or shift. The amount of chemicals at the lab bench shall be as small as practical.

The Chemical Hygiene Officer shall examine stored chemicals for container integrity and/or deterioration at least annually. The inspection should determine whether any corrosion, deterioration or damage has occurred to the storage facility as a result of leaking chemicals.

The Chemical Hygiene Officer shall conduct periodic inventories of chemicals outside the storage area. The CHO shall communicate with faculty to determine what items are needed outside the storage area. Unneeded items shall be properly discarded or returned to the storage area.

C. Chemical Handling

Each laboratory employee / student (with the training, education and resources provided by supervision) shall develop work habits consistent with requirements of OSHA standards to minimize potential personal and co-worker exposure to chemicals. 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, are:

1. Skin contact with chemicals shall be avoided at all times.

2. Employees/students shall wash all areas of exposed skin prior to leaving the laboratory. Hand soap is provided at each sink.

3. Mouth suction for pipetting or starting a siphon is prohibited.

4. Eating, drinking, smoking, chewing gum or application of cosmetics in the laboratories at any prep area is prohibited.

5. Storage of food or beverages used for personal consumption is not allowed in the storage areas or refrigerators used for laboratory operations.

6. Determination of risks shall be conservative in nature.

7. Any chemical mixture shall be assumed to be as toxic as its most toxic component.

8. Substances of unknown toxicity shall be assumed to be toxic.

9. Laboratory employees/student workers shall receive Right-to-Know (RTK) training annually to ensure safe work practice in the lab area. Training on the symptoms of exposure for specific chemicals which they work with will also be provided, as well as the precautions necessary to prevent exposure.

10. In all cases of chemical exposure, neither the Permissible Exposure Limits (PEL's) of OSHA or the Threshold Limit Values (TLV's) of the American Conference of Governmental Industrial Hygienists (ACGIH) shall be exceeded.

11. Engineering controls and safety equipment in the laboratory shall be utilized and inspected in accordance with guidelines established in the CHP.

12. Each laboratory area will maintain an inspection log, which documents eyewash/shower function.

13. Specific precautions based on the toxicological characteristics of individual chemicals shall be implemented as deemed necessary by the Faculty and Chemical Hygiene Officer.

14. Isopropanol and bleach wipes are approved for anti-viral use.

15. Prep room should only be used for its designated purpose.

16. If hazardous materials or chemicals are transported between the campuses or offsite of the college, it must be done by the CHO or key faculty member. Less hazardous materials (such as liquid nitrogen or DNA samples), can be transferred by students or college staff. The CHO should be informed before any samples of any type are transferred offsite so they can be recorded in the college records.

D. Laboratory Equipment and Glassware

All employees / student workers/ students shall keep the work area clean and uncluttered.

At the completion of each workday or operation, the work area shall be thoroughly cleaned and all equipment properly cleaned and stowed.

In addition, the following procedures shall apply to the use of laboratory equipment:

1. All laboratory equipment shall be used only for its intended purpose.

2. All glassware will be handled and stored with care to minimize breakage; all broken glassware will be immediately disposed of in the broken glass container. All glassware will be cleaned after use in a timely manner.

3. All evacuated glass apparatus shall be shielded to contain chemicals and glass fragments should implosion occur.

4. Labels shall be attached to all chemical containers, identifying the contents and related hazards.

5. Waste receptacles shall be labeled as such.

6. All laboratory equipment shall be inspected on a periodic basis and replaced or repaired as necessary.

E. Personal Protective Equipment

Safety glasses, meeting ANSI Z87.1, are required for employees/students and visitors to the laboratory. They will be worn at all times when chemicals are being used or manipulated in the laboratory.

The wearing of contact lenses in the laboratory is strongly discouraged. The Employer will include information regarding the use of contact lenses in its laboratories in training materials.

Chemical goggles and/or a full-face shield meeting ANSI Z87.1 shall be worn during chemical transfer and handling operations as procedures dictate. Any other safety glasses including prescription safety glasses may be purchased by the college for faculty or staff only after the faculty or staff employee submits a written request and the purchase has prior approval of the Director of Public Safety and the employees Director/Dean.

Chemical resistant aprons should be worn in the laboratory where corrosives, flammable and toxic materials are utilized. Aprons shall be removed immediately upon discovery of significant contamination.

Appropriate chemical-resistant gloves (based on information from the included glove selection table) shall be worn at all times when there exists the potential for skin contact with chemicals.

Used gloves shall be inspected and decontaminated prior to use. Damaged or deteriorated gloves will be immediately replaced. Gloves should be rinsed/washed prior to removal from hands.

Thermal resistant gloves shall be worn for operations involving the handling of heated materials and exothermic reaction vessels. Thermal resistant gloves shall be non-asbestos and shall be replaced when damaged or deteriorated.

ARCC does not provide respirators. If a student decides to use a respirator, they are responsible that the usage complies with the OSHA Respiratory Protection Standard, 29 CFR 1910.134, and the Respiratory Protection Program.

F. Personal Work Practices

Faculty and CLAs shall make reasonable efforts to ensure that each student knows and follows laboratory-specific rules and procedures established by this plan. For example, safety rules and requirements in Biology may differ from those in Chemistry.

All employees/students shall remain vigilant to unsafe practices and conditions in the laboratory and shall immediately report such practices and/or conditions to the laboratory supervisor. The supervisor must PROMPTLY correct unsafe practices or conditions.

Student supervision is required at all times when hazardous chemicals, infectious substances, or regulated materials are in use. Faculty or staff needs to remain in the work areas during times these materials are being used.

Long hair or loose-fitting clothing shall be confined close to the body to avoid contact with chemicals or being caught in moving machine/equipment parts.

Closed toed shoes and knee length pants are required while handling any hazardous chemical.

Use only those chemicals appropriate for the ventilation system.

Avoid unnecessary exposure to all chemicals by any route.

Do not smell or taste any chemicals.

Encourage safe work practices in co-workers by setting the proper example. Horseplay is strictly forbidden.

Seek information and advice from knowledgeable persons regarding standards and codes about the hazards present in the laboratory. Plan operations, equipment and protective measures accordingly.

Use engineering controls in accordance with CHP procedures.

Inspect personal protective equipment prior to use and wear appropriate protective equipment as procedures dictate and when necessary to avoid exposure.

G. Labeling

All containers in the laboratory shall be labeled. This includes chemical containers and waste containers. The labels shall be informative and durable, and at a minimum, will identify contents, source, and date of acquisition and indication of hazard. Under no circumstances shall an unlabeled container of any substance be left in the laboratory. If chemicals are transferred to a secondary

container the container should have the proper NFPA labeling. Containers purchased after this date will have NFPA labeling.

Exemptions for labeling requirements shall be made for chemical transfers from a labeled container into a container, which is intended only for the immediate use of the employee who performed the transfer.

The labeling program shall be periodically inspected by the Chemical Hygiene Committee to ensure that labels have not been defaced or removed.

H. Hazardous Waste Disposal

Before creating a hazardous waste stream, faculty or staff must contact the CHO to review proper containment labeling, collection, and disposal considerations. Any hazardous waste designated site will be inspected weekly by the CHO. The CHO will also review any hazardous waste material before it is sent to disposal, and oversee the disposal process. All hazardous waste must be reported so proper documentation for the college waste log can be made and that proper tracking of the waste stream can be accomplished.

I. Infectious Waste Disposal

Guidelines for setting up an infectious waste stream are the same as for a hazardous waste stream, however any faculty or staff using this stream must view the requirements listed in the Infectious Waste Management Plan. Faculty or staff must contact the CHO with any questions regarding this. Users of infectious waste streams and must be prepared to answer questions as to weekly usage and storage of this waste stream, so it can be properly documented and disposed of. All infectious waste must be reported so proper documentation for the college waste log can be made.

J. Universal Waste Disposal

Universal waste can be disposed of by contacting the college CHO for pickup and disposal. The CHO can be contacted anytime to dispose or collect waste of this type. Universal Wastes include empty spray paint or fixer cans, empty gas cylinders (small or large), non-infectious sharps containers, latex or other water based paint, used oil and oil filters, rechargeable batteries, electronic components or devices, computers and computer parts, appliances, specialty light bulbs, silver containing solids, photography fixer and developer, empty chemical drums, biological specimens and specimen storage fluid, biological media, and sterile blood.

All rechargeable batteries must be recycled. The CHO is responsible for proper disposal. Single use batteries do not require special disposal.

All Universal Waste streams must be counted and recorded as necessary as they are removed for the college. All this information must be reported and

communicated to the college CHO for proper record keeping and documentation. The CHO will work with area supervisors to set up acceptable collection and removal methods of specific universal waste streams that are generated by each college department. All universal waste must be reported so proper documentation for the college waste log can be made.

5.0 CRITERIA FOR IMPLEMENTATION OF CONTROL MEASURES

A. When to use fume hoods:

Hoods should be used WHENEVER POSSIBLE to contain and exhaust toxic, offensive or flammable materials. Processes that have potential for generating hazardous airborne chemical concentrations should be carried out within the fume hood.

B. When to use safety shields or other containment devices:

Safety shields must be used where the possibility exists for laboratory scale detonation. Protective devices, such as long and short handled tongs for holding or manipulating hazardous items should be used WHENEVER POSSIBLE.

C. When to use personal protective equipment:

Eye Protection –All personnel in the laboratory must wear safety goggles or laboratory splash glasses whenever hazardous chemicals are in use, or whenever any chemicals are being used in the chemistry or biology science lab areas. NO EXCEPTIONS.

Gloves – Gloves should be worn to protect the skin from chemical and physical (e.g. heat, cold) exposures. Soiled or damaged gloves should be decontaminated and disposed of properly.

Respirators – ARCC courses do not conduct experiments requiring the use of respirators.

Closed Toe Shoes - when handling any hazardous chemical.

Knee Length Pants – when handling any hazardous chemical.

D. When to institute special work practices:

The laboratory supervisor and the Chemical Hygiene Officer must approve special work practices. If particularly hazardous chemicals are to be used (e.g. carcinogens, reproductive toxins, teratogens, or acutely toxic chemicals), specific work practices and work locations must be designated.

6.0 FUME HOOD MANAGEMENT

A. Frequency and type of monitoring:

All local exhaust hoods used for primary containment control will be monitored for adequate airflow on an annual schedule. The survey will be completed with a calibrated velocimeter.

B. Acceptable operating range:

Minimum face velocities of at least 100 linear fpm must be maintained for each hood. If the face velocity does not meet a MEI recommended minimum of 100 linear fpm, the Safety Officer must be contacted to arrange for repair or upgrade the hood. If necessary, repairs or upgrades shall be made within a reasonable time.

7.0 EMPLOYEE INFORMATION AND TRAINING

A. Information

A copy of 29 CFR 1910.1450 (Laboratory Safety / Chemical Hygiene Standard) can be found on the OSHA web-site: www.osha.gov.

The Threshold Limit Values published by the American Conference of Governmental Industrial Hygienists can be found in the Documentation Section of the manual. Recommended exposure limits for other hazardous chemicals, information on signs and symptoms associated with exposures to hazardous chemicals, material safety data sheets, and other information on the hazards, safe handling, storage and disposal of hazardous chemicals can be found in this manual.

A list of OSHA health hazard definitions and lists of select carcinogens, reproductive toxins and high acute toxicity materials are included in the Documentation Section of the manual.

A SDS for each chemical in the lab work area shall be available at all times to everyone in the laboratory. SDS sheets are also available online. Requests can be made to the CHO for online resource use and setup of these uses.

B. Training

Employees/student workers will be provided with training to ensure that they are apprised of the hazards of chemicals present in their work area. Such training will be provided within six months of the time of an employee's initial assignment to a work area where hazardous chemicals are present and prior to assignments involving new exposure situations. Refresher training will be provided annually. Area workers that are involved with the long term storage of hazardous wastes must attend and annual waste handling course.

Employee/student worker training will include:

- Methods and observations that may be used to detect the presence or release of a hazardous chemical.

- The physical and health hazards of chemicals in the work area.

- The measures employees can take to protect themselves from these hazards.

- The applicable details of the Chemical Hygiene Plan and Emergency Response Plan.

Student training will include:

- Right to Know training (RTK) as described on the quote "Right to Know Training and Lab Safety Completion Form".

- Training will be given at the beginning of each semester.

- Faculty will provide the training. Upon successful completion of training the completed form will be returned to the CHO.

8.0 REQUIRED APPROVALS

Certain laboratory procedures, which present serious health hazards upon exposure, require prior approval by the Safety Officer and Chemical Hygiene Officer before work may commence.

For ARCC, prior approval is required before proceeding with the following procedures:

- Working with Carcinogens/ Teratogens /Mutagens

Biology Department

Formaldehyde Chloroform
*Formaldehyde is a suspect carcinogen but is not used in experiments.

Chemistry Department

Benzene	Benzidine	Lead
Chromium	Formaldehyde	Nickel
Lead Acetate	Chloroform	Methylene Chloride
Cadmium	Nickel Compounds	Mercury

9.0 MEDICAL CONSULTATION AND EXAMINATION

A. <u>An employee/student worker who works with hazardous chemicals or biological agents and:</u>

- develops symptoms associated with a hazardous chemical to which the employee may have been exposed in the laboratory

- works where exposure monitoring reveals an exposure level routinely above the OSHA action level or, in the absence of a designated action level, exposure above the OSHA Permissible Exposure Limit, (PEL), (as published in 29 CFR 1910.1000, 1990) for OSHA regulated substances for which there are medical monitoring and medical surveillance requirements. Chemicals that fall within this category are:

  - Asbestos
  - Vinyl Chloride
  - Inorganic Arsenic
  - Lead
  - Benzene
  - Coke Oven Emissions
  - Cotton Dust
  - 1, 2-Dibromo-3-Chloropropane
  - Acrylonitrile
  - Ethylene Oxide

  - Formaldehyde
  - Carbon Tetrachloride
  - 2-aminonapthalene

- or is exposed to a hazardous chemical or biological agent during a spill, leak, or explosion or other occurrence resulting in exposure is entitled to medical attention including an examination and follow-up exams as deemed necessary by the physician chosen for the employee.

An examination is provided without cost to the employee, without loss of pay, and conducted at a reasonable time and place.

B. <u>Procedures to secure medical consultation and examination are as follows:</u>

1. Report exposure to Educational Services Dean and / or the Chemical Hygiene Officer.

2. Seek medical care at a health care center of the employee's choice.

3. The Health and Safety Officer will provide the following information to the physician:

   a) Identity of hazardous chemical.

   b) Description of conditions under which exposure occurred.

   c) Description of signs and symptoms employee is experiencing.

4. A written opinion from the physician shall be provided to the employer including:

   a) Recommendation for furthers medical follow-up.

   b) Results of medical exam and tests.

   c) Any medical condition revealed during the exam that places the employee at increased risk.

   d) A statement that the employee has been informed by the physician of the results of the exam and any medical condition that may require further treatment or examination.

10.0 ADDITIONAL PROTECTION FOR WORK WITH PARTICULARLY HAZARDOUS SUBSTANCES

A. Biosafety Level#2 Requirements

When working with any type#2 pathogen the following extra requirements and considerations must take place. These considerations are added to the above chemical handling, personal protective equipment, and laboratory policies listed above in the Chemical Hygiene Plan. Lab practices, setup, and procedures must conform to those listed in the Center for Disease Control biosafety level#2 considerations.

1. Biohazard symbol/labels must be posted in the lab area these materials are being used.

2. Lab users must be given training for practices for handling level#2 materials. Local lab policies should be noted and observed by all lab users.

3. Lab coats must be worn during use of any type#2 materials. The lab coats should be stored in the lab area.

4. Screw top, leak proof containers should be used for the storage and transport of all materials and media of this type.

5. Surfaces, lab ware, and waste materials must be decontaminated after using any type#2 materials.

B. Carcinogens and Acute Toxins

Work with selected carcinogens, reproductive toxins and substances that have a high degree of acute toxicity (e.g., potential to destroy or kill immediately) may require additional employee protection. Specific consideration will be given to:

1 Establishment of a designated area.

2. Use of containment devices such as fume hoods or glove boxes.

3. Procedures for safe removal of contaminated waste.

4. Documentation of all necessary procedures.

11.0 EMERGENCY RESPONSE/CHEMICAL SPILLS

All laboratory employees / personnel/students (especially those involved in the use of chemicals) should be familiar with ARCC's Emergency Response / Action Plan. This plan shall contain emergency telephone numbers and spill response contacts.

A. When chemical spills occur within the Laboratory, the following procedures are followed to prevent injury or property loss and performed by authorized personnel:

1. Provide any first aid (if necessary) to affected personnel/students. Liberally use eyewash station and/or safety shower to flush affected areas. Recommend flushing continuously for at least 15 minutes. A large exposure to the body merits ambulance service.

2. Notify Supervision of spill. If spill is large or extremely hazardous, the Administration and Maintenance Supervisor will be notified. First Aid personnel may also require notification.

3. Evacuate personnel / students from the area.

4. If spilled materials exhibit flammability, eliminate ignition sources, such as hot plates, Bunsen burners, etc.

5. Avoid all contact with spilled material as possible. If necessary, don protective gloves, gown, and goggles

6. Obtain supplies from Chemical Spill Clean-up Kit and/or contact local emergency services (i.e. HAZMAT / HAZWOPER) for assistance if needed.

7. Neutralize acids and bases.

8. Contain collected materials and label container with name of contents and also as Hazardous Waste.

9. Always refer to SDS for special precautions or spill cleanup requirements.

B. Liquid Spills

1. Confine spill to small area as practical.

2. For small quantities of acids or bases, use the neutralizing agent from the chemical spill clean-up kit. An absorbent material specifically prepared for acid/base spills may also be used.

3. For small quantities of other materials, such as organic solvents, utilize an absorbent material to clean up spill. Examples of sorbent materials are vermiculite, dry sand, paper towels, etc.

4. For large quantities of inorganic acids and bases, flush with large amounts of water, preferably toward a containment area or drain. *CAUTION must be taken not to add too much water to create a flood which may react with water-reactive materials and cause spattering and additional personnel exposure.

5. If possible, utilize a mop to pick up as much of the spilled material as possible. An excellent clean-up device is the mop bucket and wringer to collect the liquid.

6. Carefully pick up and decontaminate bottles, broken glass and/or other containers. Decontaminate over the bucket and pail to collect contaminated wash.

7. Avoid using any shop vacuum which is not rated for chemical clean up. A potential exists for atomizing hazardous wastes and creating a potential human inhalation exposure.

8. If the spill is extremely volatile (high vapor pressure), allow the spill to evaporate and exhaust out the laboratory exhaust (e.g., fume hood).

9. Properly containerize, label, store and/or dispose of collected hazardous waste. (See waste disposal section for methods).

C. Solid Spills

If possible, sweep solid spills of low toxicity into a designated, easily decontaminated, dust pan and place in a labeled container for storage and/or disposal.

D. Additional Spills

Mercury – Clean up with pre-purchased spill clean-up kit. Collect Hg in a sealed container to prevent exposure to Hg vapors. Large spills or spills that render some Hg unavailable for cleanup (e.g., Hg in floor cracks or beneath lab benches); an airborne evaluation of Hg vapor content may be required.

E. Compressed Gas Cylinders

Compressed gas cylinders, if present, are to be stored and maintained in accordance to the Compressed Gas Association guidelines and best practices. Emergency handling of compressed gas cylinders will be delegated to train emergency personnel (i.e. fire department, etc.).

F. Incident Report

An incident investigation should take place after each spill and/or accident. The Incident report should be completed by the Instructor/College Laboratory Assistant and forwarded to the Dean, Educational Services, the Chemical Hygiene Officer, the Safety Officer, and the Safety Committee Chair. The incident will be discussed in the Safety Committee and actions (if any) deemed necessary to prevent future incidents will be implemented within a reasonable time.

SUGGESTED CHEMICAL STORAGE PATTERN

Storage of laboratory chemicals presents an ongoing safety hazard for college science departments. Many chemicals are incompatible with each other. The common method of storing these products in alphabetical order sometimes results in incompatible shelved materials. For example, storing strong oxidizing materials next to organic chemicals can present a hazard.

A possible solution is to separate chemicals into their organic and inorganic families and then to further divide the materials into related and compatible families. Below is a list of compatible families. The following page provides this family arrangement pictured as shelf areas in the chemical storage area.

INORGANIC	**ORGANIC**
1. Metals, Hydrides	1. Acids, Anhydrides, Peracids
2. Acetates, Halides, Iodides, Sulfates, Sulfites, Halogens, Thiosulfates, Phosphates	2. Alcohols, Glycols, Amines, Amides, Imines, Imides
3. Amides Nitrates, (except Ammonium Nitrate), Nitrites, Azides	3. Hydrocarbons, Esters, Aldehydes
4. Hydroxides. Oxides, Silicates,	4. Esters, Ketones, Ketenes,

Carbonates, Carbon	Halogenated Hydrocarbons, Ethylene Oxide
5. Sulfides, Selenides, Phosphides, Carbides, Nitrides	5. Epoxy Compounds, Isocyanides
6. Bromates, Perchlorates, Perchloric Acid, Chlorites, Hypochlorites, Peroxides, Hydrogen Peroxides	6. Peroxides, Hydro peroxides, Azides
7. Arsenates, Cyanides, Cyanates	7. Sulfides, Polysulfides, Sulfoxides, Nitriles
8. Borates, Chromates, Manganates, Permanganates	8. Phenols, Cresols
9. Acids (except Nitric) * Nitric Acid is isolated and stored by itself.	10. Sulfur, Phosphorus, Arsenic, Phosphorus Pentoxide

ADDITIONAL STORAGE SUGGESTIONS

A. Storage of Chemicals

1. Avoid floor chemical storage (even temporarily).

2. No top shelf chemical storage.

3. No chemicals stored above eye level on open shelves. This would be considered a height of five feet.

4. Store acids in dedicated acid cabinets. Store Nitric Acid in that same cabinet ONLY if isolated from other acids. Store both inorganic and some organic acids in the acid cabinet.

5. Store flammables in a dedicated flammables cabinet.

6. Store severe poisons in a dedicated locked poisons cabinet.

7. Segregate known or suspect carcinogens from other chemicals.

B. Storage Areas

1. Storage areas shall NOT be used as preparation or repackaging areas.

2. Storage areas shall be accessible during normal working hours. Storage areas are under the control of the chemistry and biology laboratory assistants and the other CLAs. Access to storage areas shall be restricted to the Chemical Hygiene Officer, the Safety Officer, CLAs, and Faculty. These personnel are authorized to escort those with a need to know to storage areas.

C. Shelving

1. Shelf assemblies are firmly secured to walls. Island shelf assemblies should be secure.

2. Provide anti-roll-off lips on all shelves.

3. Ideally shelving assemblies would be of wood construction.

4. Avoid metal, adjustable shelf supports and clips. Use fixed wooden supports.

D. Refrigerator Storage

1. If you store volatile materials (ether, hydrocarbons, etc.) in a refrigerator, the refrigerator must be explosion-proof. The thermostat switch or light switch in a standard refrigerator may spark and set off the volatile vapors in the refrigerator and cause an explosion.

SUGGESTED SHELF STORAGE PATTERN – INORGANIC

INORGANIC #10	INORGANIC #7
INORGANIC #2	INORGANIC #5
INORGANIC #3	INORGANIC #8
INORGANIC #1	INORGANIC #6

INORGANIC #4	MISCELLANEOUS

Note: Avoid storage of any chemicals on the floor.

#9 – Store acids in a designated cabinet.

SUGGESTED SHELF STORAGE PATTERN – ORGANIC

ORGANIC #2	ORGANIC #8
ORGANIC #3	ORGANIC #6
ORGANIC #4	ORGANIC #1

ORGANIC #5	MISCELLANEOUS
ORGANIC #7	MISCELLANEOUS

Note: Avoid storage of any chemicals on the floor.

Attachment A to Chemical Hygiene Plan
HEALTH AND SAFETY PROGRAM FOR LABS
Anoka-Ramsey Community College
Summary of Responsibilities**

CLA*	CHO*	Faculty	Dean(s)	Health and Safety Officer	Office of the Chancellor
Attend annual safety/health training	Attend annual safety/health training oversee RTK training of students and faculty	Attend annual safety/health training	Alert H/S Officer of procedural violations	Assist with chemical and hazardous waste disposal	Monitor college/university safety compliance plans
Create, update, and maintain safety and health procedures	Assist/oversee procurement of chemicals	Adhere to safety/health procedures	Prioritize CLA work assignments	Ensure training is accomplished per regulations	Ensure training records are accurate/complete
Verify that all containers are properly labeled and stored.	Provide continued direction for Chemical Hygiene Plan	Have overall compliance responsibilities in classrooms and labs	Monitor common course outlines for Health/Safety Compliance	Interpret and apply appropriate safety and health regulations and processes	Provide assistance through Fire/EMS/Safety Center
Keep laboratories neat and orderly	Review Chemical Hygiene Plan annually and recommend necessary changes	Encourage and promote classroom cleanliness		Provide support to faculty and staff on rules and regulation enforcement	Apply appropriate regulations to commensurate with hazards
Keep inventory of chemicals. Coordinate purchasing of chemicals with the Faculty	Keep inventory of chemicals. Coordinate purchasing of chemicals with the Faculty	Monitor inventory of chemicals. Coordinate purchasing of chemicals with the CLAs		Responsible for all RTK training covered under the CHP	
Assist in lab: testing and monitoring	Ensure all chemical and material containers are properly labeled and stored	Provide RTK training to students		With Chemical Hygiene Officer and Deans, develop timeline and records to implement Chemical Hygiene Plan	
Complete all necessary manifests	With Safety Officer and Deans, develop timeline and records to implement Chemical Hygiene Plan			Conduct college wide safety inspection	
Properly dispose of unused chemicals and hazardous waste. Report all violations to immediate supervisor	Conduct college wide chemical safety inspections				
Select Vendors for lab maintenance	CHO Responsible for budgeting and proper disposal of all chemical, hazardous, and universal waste				

*CLAs and the CHO have overlapping responsibilities. The CHO is not excluded from CLA areas of responsibility.
**Responsibilities reviewed annually in conjunction with review of Chemical Hygiene Plan. 5.15.14