**Purpose and or Principle**

The Laboratory Department is committed to providing a safe working environment and believes employees have a right to know about health hazards associated with their work. So that employees can make knowledgeable decisions about any personal risks of employment, this Chemical Hygiene Plan includes policies, procedures, and responsibilities designed to develop in employees an awareness of potentially hazardous chemicals in the workplace and to train employees in appropriate, safe working conditions.

It is important that employers assume responsibility for laboratory safety. All employees will have access to pertinent safety information through their supervisory staff. The people who work in any given laboratory are best able to detect potential hazards in either the facility or in work procedures. When safety concerns arise, employees are encouraged to contact their supervisor.

A training program has been designed for the benefit and protection of all laboratory employees. Necessary information will be available to inform the employee how best to handle hazardous chemicals and how to make use of the new law. Annual training will be conducted annually at one of the monthly staff meetings. Staff will review the Chemical Hygiene plan and review locations for MSDS’s and chemical inventory.

**Responsibilities**

It is the responsibility of the following staff members to be sure the Chemical Hygiene plan is implemented and up to date at all times.

Laboratory Director: The laboratory director will review the procedure to be sure that it is complete and provides the adequate coverage for the safety in the lab.

Laboratory Admin Director: Will update the procedure and work with the Lead staff to be sure all new chemicals or agents are included in the training program. The lab admin director will also arrange for annual training for staff that work directly with any of the agents deemed hazardous.

Lead Technologists: Will maintain up to date inventories of potentially hazardous chemicals and report any changes to the lab admin director.

Chemical Hygiene Officer: Laboratory Lab Safety Officer

Hazardous Waste Disposal: Director of Environmental Services.

**Standard Operating Procedure**

Because few laboratory chemicals are without hazards, general precautions for handling all laboratorychemicals should be adopted to include minimizing exposure and assuming that any mixture of hazardous chemicals is more toxic than the most toxic component.

The following procedures are used when working with chemicals:

1. **Accidents and Spills:**

 **a. Eye contact:** promptly flush eyes with water for a prolonged period *(*15minutes**)** and seek medical attention.

 **b. Ingestion**: encouragethe victim to drinklarge amounts ofwater.

**c. Skin contact:** promptly flush the affected area with water and remove any contaminated clothing; use a safetyshower when contact is extensive. If symptoms persist after washing, seek medical attention**.**

 **d. Clean-up:** promptly clean up spills, using appropriate protective apparel and equipment for proper disposal. For chemical spills use kits outside histology. For blood and **body fluid spills** useBASK system located in the storeroom. For formaldehyde spills use formaldehyde spill kit in histology grossing room. Refer to RMC policy # 3260 for Hazardous Spill Response.

**2. Avoid Unnecessary Exposure** **to Chemicals:**

**a**. Do not smell or taste chemicals. Apparatus that can discharge toxic chemicals (vacuum pumps, distillation columns, etc.) should be vented into local exhaust devices.

**b**. Inspect gloves before use.

**c.** Use only those chemicals for which the quality of the available ventilation system is appropriate.

**d**. Eating, drinking, smoking, gum chewing, or applying cosmetics or lip balm in areas where laboratory chemicals are present is prohibited. Wash hands before conducting these activities.

**e.** Storing, handling, or consuming food or beverages in storage areas, refrigerators, glassware, or utensils that are also used for laboratory operation is prohibited.

**f**. Handle and store laboratory glassware with care to avoid damage; do not use damaged glassware. Use equipment only for its designed purpose.

**g**. Wash areas of exposed skin thoroughly before leaving the laboratory.

**h.** Practical jokes or other behavior that might confuse, startle, or distract another worker is prohibited.
 **i**. Do not use mouth suction for pipetting or starting a siphon.

**j.** Confine long hair and loose clothing.

**k**. Wear shoes at all times in the laboratory, but do not wear sandals, perforated shoes, sneakers, or any shoes made of canvas. Refer to Lab Dress Code Policy found on Ridgenet.

**l**. Keep the work area clean and uncluttered, with chemicals and equipment properly labeled and stored; clean up the work area on completion of an operation or at the end of each day.

**m**. Ensure that appropriate eye protection, where necessary, is worn by all persons, including visitors, in areas where chemicals are stored or handled.

**n.** Wear appropriate gloves when the potential for contact with toxic materials exists; inspect the gloves before each use, wash them before removal, and replace them periodically.

**o**. Use appropriate respiratory equipment when air contaminant concentrations are not sufficiently restricted by engineering controls. Inspect the respiratory before each use.

**p**. Use any other protective and emergency apparel and equipment as appropriate.

**q.** Avoid use of contact lenses in the laboratory unless necessary; if they are used, inform supervisor so special precautions can be taken. Be sure to wear eye protection when a chance of splattering is present.

**r.** Remove laboratory coats immediately upon significant contamination.

**s**. Seek information and advice about hazards, plan appropriate protective procedures, and plan positioning of equipment before beginning any new operation.

**t**. Use a hood for operations that might result in release of toxic chemical vapors or dust.

As a rule of thumb, use a hood or other local ventilation device when working with any appreciably volatile substance with a TLV of less than *50* ppm.

Confirm adequate hood performance before use: keep hood closed at all times except when adjustments within the hood are being made. Keep materials stored in hoods to a minimum, and do not allow materials to block vents or air flow.

Leave the hood “on” when it is not in active use if toxic substances are stored in it or if it is uncertain whether adequate general laboratory ventilation will be maintained when it is ‘off”.

1. Be aware of unsafe conditions and see that they are corrected when detected. Report all unsafe conditions directly to the Lead Tech for the area of concern.

**Chemical Inventory**

A chemical inventory of all the hazardous chemicals in the laboratory is prepared by Materials Management. This inventory is checked annually for additions, deletions, or corrections. Chemicals listed are those classified as hazardous by the Department of Transportation (DOT), The Environmental Protection Agency (EPA), or displaying a 2 or greater number in any section of the National Fire Protection Association (NFPA), diamond. DOT and EPA classifications are in Appendices A and B.

Chemicals are listed by section and include the following information:
• Product Name
• Chemical name
• Vendor
• Hazard code

A complete chemical inventory is located in the Chemical Hygiene plan manual, in
Materials Management and in each department.

**Material Safety Data Sheets**

Upon completion of the chemical inventory, request letters are sent to manufacturers if MSDS are missing or on-line availability is checked.

MSDS’s are available for each laboratory section on-line at <http://3eonline.com/eeeOnlinePortal/DesktopDefault.aspx>. The MSDS can be searched for by chemical name or location. The log on information is Name: ridgeview, password: msds. The laboratory relies on the chemical manufacturer’s information to ascertain whether or not the chemical is hazardous.

**Chemical Storage**

Storage of laboratory chemicals presents an ongoing safety problem. Chemical storage is kept as small as practical. Storage on bench tops and in hoods may cause potential exposure to fire and spills and should only be in the quantities needed for daily use.

Chemicals are stored as follows:

1. Flammable liquids are stored in flammable storage cabinets with self-closing doors and proper ventilation according to NFPA standards. This cabinet is located outside the Histology lab. Safety cans with spring loaded spout are used for transporting flammable liquids and bench top use.

2. Concentrated acids and bases need to be stored in an appropriate acid cabinet and are adequately vented. Acids are stored under the hood in Histology.

3. Reagent chemicals that need refrigeration are stored in temperature monitored refrigerators. No food is permitted in these refrigerators.

4. Reagent chemicals that do not need refrigeration are stored on labeled shelves in the department or in the laboratory storage area.

5. Cylinders of compressed gases are strapped or chained to a wall or bench top and are capped when not in use. Extra tanks are stored by Maintenance.

**Labeling**

The 29 CFR 1910.1450 contains specific labeling requirements. Labeling must be done on all hazardous chemicals that are shipped and used in the workplace. Labels must not be removed or defaced.

 **On Shipped Chemicals**

Chemical manufacturers, importers and distributors make sure that each container must also be labeled. These workplace labels must contain:

1. Identity of the hazardous chemical
2. Appropriate hazard warnings.
3. Name and address of the chemical company (i.e., manufacturer).

 **On In-Plant Chemicals**

Each hazardous chemical transferred outside the laboratory that is not in its original container must also be labeled. These workplace labels must contain:

1. Identity of the hazardous chemical.
2. Route of entry (e.g., eyes, nose, mouth, skin)
3. Health Hazard
4. Physical Hazard
*5.* Target Organ Affected

An example of a computer-generated label is shown below:

**LABORATORY
ACETIC ACID
Route of Entry: Eyes, Skin, Nose
Health Hazard: Poison
Physical Hazard: Corrosive
Target Organs: Skin and Lungs**

 **Engineering Controls**

CSI/North Central (phone # 763–383 - 9535) will perform the following annually:

1. Inspect measure air flow and certify the fume hood in histology.
2. Measure air flow in histology grossing room and morgue.
3. Inspect measure air flow and certify cover-slipping and staining exhaust system in
histology lab.

CSI/NorthCentral, Inc. (phone # 763- 383- 9535) will inspect air flow, check hepafilter, and certify
the leminar flow biological safety cabinet. Records for hood inspections are retained in Facilities management.

Eyewash fountains are inspected every six months and records kept by Facilities Management.
Safety showers are inspected, tested, and flushed annually and records kept by Facilities Management.

Fire extinguishers are inspected annually by Facilities Management and the Fire Marshall.
All chemical storage areas are adequate and properly ventilated (See Chemical Storage for
locations).

 **Personal Protective Equipment**

Employees are required to wear gloves when drawing blood or testing and handling blood or body fluids.

Fluid resistant lab coats are to be worn in the laboratory when working with blood or body fluids or with instrumentation, and are to be buttoned to protect the employee’s clothing. Fluid resistant lab coats are provided and laundered by Ameripride. Lab coats may be worn for patient draws but must be removed when on break or at completion of shift.
In areas where chemical splashes are great (e.g., histology), an impervious apron appropriate for the task is worn.

Masks and eye protection or chin-length face shields are worn to prevent splashes or sprays of blood, infectious materials, or hazardous chemicals if there is a potential for eye, nose, or mouth contamination. This equipment is located in the Histology lab and in Chemistry. For routine opening of blood tubes use protective shields or biohazard wipes.

Where the use of respirators is necessary to maintain exposure below permissible exposure limits, the employer provides, at no cost to the employee, the proper respiratory equipment located in the Histology lab. The respirators shall be selected and used in accordance with the requirements of 29 CFR 1910.134. Respirator certification is conducted annually for those employees required to wear respirators.

See Laboratory Infection Control Procedure P10177 available on Ridgenet under Procedures and Pathology Infection Control procedure P101321

 **Contaminated Waste Removal/Disposal**

To assure that minimal harm to people, other organisms and the environment will result from the disposal of laboratory waste, the following hospital policies specify how waste is to be collected, segregated, stored, and transported: policy #4064 Infectious Waste Policy and policy #2490-Hazardous Waste Policy, (see Ridgenet). All disposal is done in accordance with the Department of Natural Resources in Minnesota.

The laboratory is considered a small quantity generator according to the EPA and has an EPA generator number of MND 120015094 obtained by applying on an EPA Form 8700-12 to the regional offices located in Chicago, IL.

Certain chemicals are permissible for drain disposal. The local sanitary sewer district, Carver County Environmental Services, was contacted to determine what was and was not acceptable (see Appendix J). The drain system connects to a sanitary sewer system that ultimately flows to a waste water treatment facility located in Minneapolis (MWCC - Metropolitan Waste Control Communication) At no time was a septic tank system used. Sewered chemicals are flushed with at least 100 volumes of excess water.

Waste is removed from the laboratory and disposed of as follows:

Hazardous Wastes:
1. Sewered
Infectious Waste (sharps and lab/pathology waste):
1. Picked up daily by maintenance.
2. Stored in hazardous storage area steel cabinet outside of building.
3. Picked up weekly by Medical Safety System of Cannon Falls, MN for incineration.

  **Administrative Controls**

The Laboratory Director is responsible for the safe operation of the area. All activities and procedures
require approval by the Medical Director and the employer before implementation.

Environment monitoring is required in all laboratories for the following chemicals stored or used 3 times/week:

 **29 CFR 1910 Subpart Z**

1910. 1001 Asbestos, tremolite, anthopohyllite, and actinolite (eff. 7-21-86)
1910.1002 Coal tar pitch volatiles; interpretation of term
1910.1003 4-Nitrobiphenyl
1910.1004 alpha-Nephthylamine
1910.1005 [Reserved}
1910.1006 Methyl chloromethyl ether
1910.1007 3,3’ - Dichlorobenzidine (and its salts)
1910.1008 bis-Chloromethyl ether

1910.1009 beta-Naphthylamine
1910.1010 Benzidine
1910.1011 4-Aminodephenyl
1910.1012 Ethyleneirnine
1910.1013 beta-Propiolactone
1910.1014 2-Acetylarninoflurene
1910.1015 4-Demethylaminoazobenzene
1910.1016 N-Nitrosodimethylamine
1910.1017 Vinyl chloride
1910. 1018 Inorganic arsenic
1910.1025 Lead
1910.1028 Benzene
1910.1029 Coke oven emissions
1910. 1043 Cotton dust
1910.1044 1, 2-dibromo-3-chloropropane
1910.1045 Acrylonitrile
1910.1047 Ethylene oxide
1910.1048 Formaldehyde
1910.1101 Asbestos

Chemical spills are contained using the **Think C.L.E.A.N. Plan:**

• **C**lean the spill

 • **L**eave the area• **E**mergency: eye wash, shower, medical care
 • **A**ccess MSDS
 • **N**otify a supervisor

All spills are contained according to OSHA guidelines, and appropriate spill kits, located outside Histology, are used.

Assessment of significant risk of all operations is made by the Laboratory Director or Chemical Hygiene Officer. Chemical hygiene and safety policies will be established for each laboratory section and engineering controls or personal protective equipment assigned.

 **Medical Consultation and Examination**

All employees needing medical attention use the employee health services at Ridgeview Medical Center (phone # ext. 5938 during its hours of operation or are referred to ambulatory care services located at Ridgeview Medical Center - Emergency (phone # ext. 5030).

All medical examinations and consultations are performed by or under the direct supervision of a licensed physician without cost to the employee, without loss of pay, and at a reasonable time and place. A board-certified physician in occupational medicine is used whenever possible.

The employee is sent for medical evaluation:

1. Whenever signs and symptoms associated with a hazardous chemical develop

2. When environmental monitoring reveals an exposure level routinely above the action level

3. Whenever an event takes place in the work area such as a spill, leak, or explosion resulting in hazardous chemical exposure.

The laboratory provides the following information to the physician:

1. Identify of the hazardous chemical(s) to which the employee may have been exposed.

2. A description of the conditions under which the exposure occurred-including quantitative exposure data (if available).

3. A description of the signs and symptoms of exposure.

4. A copy of the MSDS for the chemical(s) involved.

The physician provides a written opinion that will not reveal specific finding of diagnosis unrelated to the exposure but will include:

1. Any recommendation for further medical follow-up.

2. Results of the medical examination and any associated tests.

3. Any medical conditions that may place the employee at increased risk as a result of exposure to a hazardous chemical found in the workplace.

4. A statement by the physician that the employee has been informed of the consultation/examination results and any medical condition that may require further examination or treatment.

 **Chemical Hygiene Officer/Committee**

The chemical hygiene responsibilities rest with the Chemical Hygiene Officer/Laboratory Director and receive backing from the facility Administrative Officer. The Chemical Hygiene Officer must:

* Work with administrators and other employees to develop and implement appropriate chemical hygiene policies and practices.
* Certify the performance of protective equipment
* Monitor procurement, use, and disposal of chemicals used in the lab
* See that appropriate audits are maintained
* Help project directors develop precautions and adequate facilities
* Know the current legal requirements concerning regulated substances
* Seek ways to improve the chemical hygiene program.
* Ensure that workers know and follow the chemical hygiene rules, that protective equipment is available and in working order, and that appropriate training has been provided
* Provide regular, formal chemical hygiene and housekeeping inspections including routine inspections of emergency equipment
* Know the current legal requirements concerning regulated substances
* Determine the required levels of protective apparel and equipment
* Ensure that facilities and training for use of any material being ordered are adequate

The laboratory employee is responsible for:

* Planning and conducting each operation in accordance with the institutional chemical hygiene procedures
* Develop good personal chemical hygiene habits

 **Training**

Annually, in conjunction with the annual mandatory education, staff should review and be familiar with the Chemical Hygiene plan. Information about laboratory safety is also contained in the Laboratory Safety Procedure # 1.1.4.03.08 and found in the Laboratory General Procedure Manual.

The objectives of the Chemical Hygiene Training are as follows:

1. Locate the potentially hazardous chemicals in the workplace.

2. Locate chemical hygiene plan, chemical inventory, and MSDS website found online at http://3eonline.com/eeeOnlinePortal/DesktopDefault.aspx

3. Recognize chemical labeling information and its meaning.

4. Locate the health hazard, physical hazard, environmental protection and special protection section of the MSDS and explain their use.

5. Identify the department Chemical Hygiene Officer by name and title.

6. Identify the appropriate protection, clothing, eye protection and special protection and special protection, gloves respiratory equipment for the area and demonstrate its use.

7. Properly handle hazardous chemicals.

8. Demonstrate emergency procedures in the event of a hazardous or infectious spill.

9. Describe the environmental monitoring procedures

10. Differentiate hazardous and infectious wastes arid proper disposal procedures.

 **Housekeeping**

Floors are cleaned regularly by Environmental Services. All employees of the Environmental Services are formally trained in the risks associated with working in the laboratory. This information is relayed to
Environmental Services employees by the Occupational Health Nurse, IC Practitioner and Environmental Services Director.

Maintenance conducts an inspection of the lab areas to assess whether:

1 Stairways and hallways are free of obstruction

2. Waste is deposited in appropriate receptacles and properly removed from the laboratory.

3. Proper storage is accomplished to minimize clutter

4. Visually the laboratory is providing a safe working environment for its employees.

 **Record Keeping**

The laboratory has established and maintained an accurate record for each employee of environmental monitoring, medical consultations, and examinations, including tests or written opinion required.

Accident records are retained by Employee Health.

Inventory and usage records for high-risk substances are maintained by Chemical Hygiene Office.
Environmental monitoring records are maintained by Materials Management.

Medical consultation records are maintained by Employee Health.

Training attendance records are maintained by Laboratory Director and Chemical Hygiene Officer.

Hazardous waste management plan reviewed annually and records maintained by Environmental Services.

All records are kept, transferred, and made available in accordance with 29 CFR 1910.20.

 **References**

The following references were used to assist in the preparation of this plan:

1. U.S. Department of Labor, final rule part **II.** *Federal Register* 29 CFR Part 1910.1450 Occupational Exposure to Hazardous Chemicals in Laboratories, Wednesday, January 31, 1990.