UNIVERSITY OF ALBERTA

AUGUSTANA MIQUELON LAKE RESEARCH STATION

Safety Manual

August 2015

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INTRODUCTION

Safety is a primary concern at the University of Alberta (U of A), and at Augustana Miquelon Lake Research Station (AMLRS). This AMLRS Safety Manual is a reference manual designed to uphold that commitment to safety by minimizing or eliminating the risk of events that could cause physical harm to Station users or others nearby, could cause damage to equipment or to the Station, or could have adverse environmental impacts. This manual was developed using safety protocols under the joint regulations of the U of A and Alberta Parks, a division of Alberta Environment and Parks.

These safety protocols incorporate general guidelines as well as more detailed information on many safety practices to be applied both within AMLRS itself and while doing fieldwork based out of the Station. Station users are responsible for their own safety and the safety of those under their supervision, including Station visitors. We ask that Station users follow these safety procedures to help protect themselves as well as those around them.

Applicable sections of this Safety Manual should be read and understood by all AMLRS users prior to Station use, or should be read and understood by supervisors and explained to those under their supervision using or working out of the Station. Doing so will make Station users more aware of risks in certain situations and of the safety protocols in place to minimize those risks. These protocols may change in response to changing Station and Miquelon Lake Provincial Park conditions, services, and Station user feedback; we ask that Station users read the Safety Manual regularly.

We appreciate your adherence to these safety policies.

EMERGENCY RESPONSE PLAN & CONTACT INFORMATION

EMERGENCY CONTACTS

Police/Fire/Ambulance	911
*Augustana Protective Services (UAPS)	780-608-2905
Forest Fire	1-780-310-3473
Camrose EMS (non-emergency)	780-608-6138
Hay Lakes Fire Department (non-emergency)	780-878-2300
Camrose Police Service (non-emergency)	780-672-4444
Office of Environmental Health & Safety	780-492-3710
Alberta Poison and Drug Information Service	1-800-332-1414

STATION CONTACTS

Augustana Miquelon Lake Research Station	
Station Manager	780-679-1574
Technology and Learning Services	780-679-1600
Facilities and Operations	780-679-1523
Facilities and Operations Safety Division	780-490-6704
Miquelon Lake Provincial Park	
Conservation Officer - Dan Neath	780-608-1416
Information Line	780-672-7274

***Contact Augustana UAPS in the event of every major incident**, after calling the appropriate emergency services. Your call will be forwarded to UAPS Headquarters (Edmonton) if Augustana UAPS is not available. UAPS determines crisis degree and response at the University level.

AMLRS location: Within Miquelon Lake Provincial Park - entering the Park from highway 623, go 300 metres past the Park Centre (on the left) and take the first staff road on the right. AMLRS is less than 100 metres up the road, and marked with a sign.

Legal Land Description: Section 20, Township 49, Range 20, West of the 4th Meridian (20-49-20-W4)

AMLRS Phone Number **780-679-1595**

FIRE AND FOREST FIRE

In case of a fire in AMLRS, fire extinguishers are located in the lab and kitchen. The fire extinguishers should only be used by someone trained in their use, and should only be used for small, safely manageable fires.

If a fire cannot be safely put out:

- Warn others nearby.
- Evacuate the Station, closing doors behind you, and gather at the muster point.
- Perform roll call to account for all Station users.
- Call 911.
- Call UAPS.

In the event of a fire in the Park not near the Station, warn others in the immediate area and call 911. Watch the fire from a distance, if safe to do so, so that you can give an accurate description of its location, size, and spread to emergency personnel.

CARBON MONOXIDE

If a smoke alarm goes off without any obvious smoke, it may be detecting carbon monoxide.

- Warn others nearby.
- Evacuate the Station, opening doors and windows behind you, if safe to do so, and gather at the muster point.
- If anyone exhibits flu-like symptoms (headache, dizziness, nausea, fatigue, etc.) call 911.
- Call UAPS. Do not re-enter the Station until an authority has approved the safety of the building.

MEDICAL EMERGENCY

There are no permanent medically trained staff at the Station; medical attention is the responsibility of individual Station users. Miquelon Lake Provincial Park staff may have basic medical training but can often only be accessed during Information Centre operating hours. In the event of a medical emergency, remain calm. Call 911 with your emergency and location. Attempt to control the situation with minor first aid (stop any bleeding, administer antihistamines, etc.) if it is safe to do so. The Station first aid kit is in the kitchen. Do not attempt additional first aid unless you are trained, as improper procedures can cause additional damage.

ACCIDENT OR INJURY

There are no permanent medically trained staff at the Station; medical attention is the responsibility of individual Station users. Miquelon Lake Provincial Park staff may have basic medical training but can often only be accessed during Information Centre operating hours. Contact the Information Centre or on-call Conservation Officer for minor assistance. The Station is equipped to handle minor scrapes, cuts, sprains, burns, stings, etc. with the first aid kit in the kitchen, if Station users are familiar with first aid practices. For more serious injuries or if Station users are untrained in first aid, call 911.

BUILDING EVACUATION

If a building evacuation is required, warn others and exit the building by the nearest entrance. If the nearest entrance is an unsafe exit, leave through the other door. If neither of those options are viable, every room in the Station except the washrooms has a window you can exit from; exit through the room farthest from the evacuation hazard.

Gather at the muster point and perform roll call to account for everyone from the Station. Call 911 or the appropriate emergency services, and then call UAPS. Do not re-enter the building until an authority has given permission.

SHELTER IN PLACE - TORNADO, EXTERNAL HAZARDOUS MATERIAL RELEASE

In the event of a severe windstorm or tornado, take shelter in the hallway or washrooms, avoiding exterior walls. Keep in mind that the danger from a severe thunderstorm persists even after a tornado has passed. Remain in the hallway until the entire storm has passed.

In the event of a hazardous materials release outside the Station, (ex. roadway or railway accident spilling hazardous materials) go into the Station and close all doors and windows. Turn off all fans. Remain indoors until advised it is safe to do otherwise.

SHELTER IN PLACE - WEAPON BEARER

If you see someone with a gun or other weapon, go indoors and lock both doors of the Station. Stay away from windows and remain quiet. Call the Park to alert them of the situation - it may be that permission has been granted for a specific purpose requiring the use of a gun or other weapon. If this is not the case or you cannot reach the Park, call 911 and then UAPS. Remain indoors until advised that it is safe to do otherwise.
If the weapon bearer somehow enters the Station, be prepared to get out and run if it is safe to do so. If you cannot safely get out, hide behind a locked and/or barricaded door. In the worst case scenario, fighting is your absolute last resort. Do anything you can to stop the attacker. For more information, visit:
http://www.protectiveservices.ualberta.ca/en/Information/Safety/ActiveShooter/Info.aspx

SUSPICIOUS OR CRIMINAL ACTIVITY

Report all suspicious or criminal activity to the Park, including vandalism, property damage, smoke or fire not in a designated fire pit, weapon bearers, and highly intoxicated individuals in danger of injuring themselves or others. The Park will call the police or will send out Park Rangers / Conservation Officers to address the situation. If you cannot reach Park staff, call 911.

WILDLIFE ENCOUNTERS

1. Bear Encounter

The best way to avoid bears is to make noise. Also watch for fresh bear signs, travel in groups, stay on trails, and avoid and report any large dead animals you come across. Know how to use bear/pepper spray and carry it with you.

If you see a bear and it is unaware of you, back away quietly without attracting its attention. If you see a bear and it is aware of you, stay calm, keep speaking, make yourself appear large (but not threatening) and back away slowly.

Never scream, make sudden movements, or run away as those may trigger an instinctive attack. For more information on bear safety, visit http://www.albertaparks.ca/kananaskis-country/advisories-public-safety/wildlife

Report any bear encounters to the Park.

2. Cougar Encounter

Again, the best way to avoid cougars is to make noise, travel in groups, and avoid areas that smell like dead animals.

If you encounter a cougar, make yourself appear large (spread your jacket), maintain eye contact, do not scream or run, and back away slowly. If the cougar approaches or attacks, fight back aggressively. For more information on cougar safety, visit http://www.albertaparks.ca/kananaskis-country/advisories-public-safety/wildlife

Report any cougar encounters to the Park.

3. Moose Encounter

Make noise so you don't surprise moose. Keep alert for moose and if you see one, stay a safe distance away. Running from moose will not cause an instinctive attack, but they can charge quickly and you will likely not be able to outrun them. For more information on moose, visit https://aesrd.wordpress.com/2014/04/09/hooves-can-be-dangerous-heres-how-to-stay-safe-around-deer-elk-and-moose/

4. Porcupine or Skunk Encounter
Both porcupines and skunks may carry rabies. If bitten by either species, seek immediate medical attention.
Contrary to popular belief, porcupines do not throw quills. To avoid being "quilled", watch for and avoid close contact with porcupines. In the event of being quilled, stay as still as possible to avoid working the quills in deeper; do not attempt to remove quills embedded in skin. Seek immediate medical attention.
Skunks can be avoided through observant behavior. Keep watch for the distinctive black and white stripes, and avoid areas that smell of skunk. If you encounter a skunk, back away slowly.
If you are sprayed by a skunk, immediately flush your eyes and face with water if they are affected. Mix a peroxide bath (one litre of 3% hydrogen peroxide, 1 tsp dishwashing detergent, 1/4 C baking soda) and wash skin and/or clothing to remove skunk smell. Let sit for five minutes. Rinse and repeat.

5. Snake Encounters
None of the snakes found in Miquelon Lake Provincial Park are venomous. To avoid potentially painful snake bites, keep an eye out for snakes sunning themselves on trails and camouflaged in grassy cover or underbrush. If bitten by a snake, clean and cover the wound. Bandage the wound if it bleeds freely and seek medical attention if stitches are required.

EXPOSURE TO THE ELEMENTS

Always be aware of the weather forecast before you leave the Station for an extended period of time. Be prepared for changing weather by wearing or packing layers of clothing, bringing a first aid kit, sunscreen, food and water in case you become trapped outdoors. If weather conditions are becoming unsafe, cease working and return to the Station.

If you believe someone, including yourself, is experiencing mild heat-illness (heat exhaustion, sunstroke, etc.) treat immediately by moving to a cool place, removing excess clothing, staying still and drinking fluids that replace both water and electrolytes (sport drinks work well - avoid energy/caffeinated drinks).
If heat stroke (elevated internal body temperature) is suspected, seek immediate medical attention. While waiting, have the person lie down in a cool area. Wrap wet sheets/towels around them and place cloth-wrapped ice packs on their neck and armpits to cool major blood vessels.

If you believe someone, including yourself, is experiencing cold-related symptoms, move the person indoors or somewhere warm. Remove or loosen clothing or jewelry that may restrict blood flow. For minor cold-injuries or illness, gently rewarm the most obviously affected areas (face, hands and feet). DO NOT rub affected areas to generate frictional heat as ice crystals in tissues may cause more damage if rubbed. Do not use hot objects (electric blankets, hot water bottles) to rewarm affected areas. Do use body heat and/or blankets to increase and conserve the persons own heat.
For suspected frostbite, seek immediate medical attention. While waiting, do not warm the affected area if you are still in a cold area (warming and subsequent refreezing can cause worse damage), but do not let the person get any colder. If fingers or toes are affected, place sterile gauze between them to prevent sticking. Do not rub the affected area to create heat, do not rub the area with ice or snow, and do not allow the person to smoke.
For suspected hypothermia, seek immediate medical attention. While waiting, remove wet clothing and place the person between blankets to warm gradually. Additional body heat may also be used, but do not rub the affected person. Attempt to warm their core (chest and abdomen) before their extremities to prevent cold shock. Give the person warm (not hot), sweet, caffeine-free drinks if they are able to drink on their own.

If you are caught in a storm, get out of any water immediately. Return to the Station as quickly as possible, and only take equipment with you if it is not a risk to your safety to do so. Close Station doors and windows and remain indoors until the storm has passed.

CHEMICAL OR BIOLOGICAL SPILLS

In the event of a chemical splash on the body:

- Remove contaminated or restrictive clothing and wash the affected area thoroughly with water for 15 minutes using the nearest shower.
- Additional medical treatment may be required. Consult the MSDS for further information. All chemical splashes to the eye should receive immediate medical attention.

In the event of a chemical spill not on the body:

- Stay clear and warn others in the area. Isolate the spill.
- Assess the situation, and determine (a) if it constitutes an emergency situation (excessively large spill, spill of an unknown material, spill of a chemical without proper cleanup materials or properly trained people to clean up) or (b) if it does not constitute an emergency situation.

- (a) If an emergency, stop the spill (upright containers, turn off taps/tanks, etc.) if safe to do so, remove sources of ignition if safe to do so, evacuate the building, and call 991 for a chemical spill emergency. Call UAPS immediately after. Do not re-enter the building without permission.
- (b) If the spill is minor, have trained personnel wearing proper personal protective equipment (PPE) use proper spill abatement material (specified in MSDSs) clean the area. The chemical spill kit is in the lab. Dispose of cleaning materials in the proper hazardous waste collection. Decontaminate the area before allowing work to resume.

In the event of a biological spill:

- Use the appropriate PPE and spill abatement materials to stop the spread of the spill. The biological spill kit is in the lab.
- Make a 10% solution of bleach.
- Soak cloths in the bleach; gently lay them over the spill, covering the area.
- Leave cloths for 25 minutes before placing cloths in a garbage bag for disposal.
- Use additional cloths and remaining bleach solution to thoroughly clean the area.
- The bleach solution can be poured down the drain; all contaminated cloths must be sealed in garbage bag and can be disposed of in regular waste.

UTILITY SHUTDOWNS

Do not perform work with chemicals during water shutdowns; there would be no water supply available for emergency showers. Lab work that does not involve the handling of chemicals, such as setting up apparatus or recording data is permissible.

MISSING PERSON

In the event of a person being missing or significantly overdue (more than an hour past their expected return) attempt to contact them by any established means - cell phone, satellite phone, radio contact, etc. Determine their last known location, expected direction of travel, final destination, and return route, if possible. Coordinate an initial search party equipped with first aid supplies, flashlights, whistles, maps, radios, etc. Establish routes and check in times for each search team before leaving the Station.

If the missing person is not found where they ought to be, call the Park and 911 to report a missing person. Be prepared to give officials information on the missing person, including their expected whereabouts, time expected back, last point of contact, etc. Continue searching until help arrives, and assist them as required.

ACCIDENT AND INCIDENT REPORTING

All incidents involving accidents, injuries, near accidents and near injuries, including but not limited to cuts, burns, sprains, falls, head injuries, broken/damaged equipment, chemical/biological spills, chemical exposure, or near instances that could have caused any of these must be reported. These reports help determine the causes of incidents, help develop corrective measures to prevent re-occurrences, and document the incident for future reference. Injury/Incident Report Forms can be found in Appendix 4. Complete the appropriate form, keep a copy for yourself, and forward copies to both the Station Manager and the Office of Environmental Health & Safety.

In some cases, Workers Compensation Board (WCB) forms (see Appendix 4) are also required. The WCB Act requires that all injuries that disable or may disable a worker for more than the day of the incident be reported within 72 hours; failure to do so could result in fines.

PART 1: SAFETY PROTOCOLS IN THE RESEARCH STATION

1) GENERAL RESEARCH STATION USE

Certain risks are present in everyday situations, and AMLRS use presents both general and unique hazards. When followed properly, the safety protocols outlined in this document greatly reduce the risk and severity of accidents and injuries while using the Station.

For your own safety and the safety of other Station users:
Smoking in the Station or within 7.5 meters of the Station is strictly prohibited.
The Station is an Idle Free zone; vehicles are not to be running unless in operation.
Under University of Albert policy, AMLRS is a dry Station; no alcohol is permitted on the site.
Pets are not permitted in the Station or on the surrounding property.

a) Personal Health and Hygiene

Maintaining proper personal health and hygiene plays a key role in minimizing risks to both personal and group safety. To keep yourself and other Station users safe:

- Wash your hands - before and after handling food, before and after entering the lab, after using the washroom, after any fieldwork, etc.
- Eat and drink - eat sufficient quantities of nutritious foods; drink plenty of water.
- Exercise - to maintain physical health.
- Sleep - to improve mental clarity.
- Relax - to reduce stress.

b) Housekeeping

As AMLRS is a fairly small Station equipped to house and host comparatively large numbers of people and their research, proper housekeeping is essential in keeping the facility safe for use. To keep yourself and other Station users safe:

Keep AMLRS clean

- Clean equipment and yourself as best as possible outside the Station before entering.
- Remove all footwear and wet or muddy clothing at the door.
- Follow the posted cleaning and maintenance schedule.
- Empty garbage and recycling bins into the bear proof garbage bin and large recycling bins as necessary.
- Cleaning solutions and cleaning equipment are supplied; please use them responsibly.

Keep AMLRS neat

- Ensure doorways are always clear, allowing doors to open and close freely.
- Ensure walkways and floor space are clear of obstructions and slipping/tripping hazards.
- Keep tables and counters free of clutter.
- Keep personal items, marked with your name, stored neatly in your designated space(s).
- Return items to their proper location when you are finished with them.

Ensure the Station is clean, tidy, powered down, locked up, and ready for new Station users when you leave. **You may be charged additional fees for leaving a mess.**

c) Utilizing and Sharing Space

AMLRS is designed to house multiple Station users and activities; people may use the Station for a day at a time, stay for weeks, or even for months. As such, Station space will often be shared among several Station users or groups. To keep yourself and other Station users safe:

- Do not share keys with people not registered to use the Station.
- Do not allow non-registered people to enter the Station. Exception: Under your supervision, and your full responsibility for their actions and wellbeing, for a brief period of time (ex. to use the washroom, for a Station tour or meeting). Non-registered people may not stay in the Station overnight. Call the Station Manager to register visitors.
- Keep personal items, marked with your name, stored neatly in your designated space(s).
- Establish and agree upon shared cleaning responsibilities and living arrangements if multiple people/groups are using the Station.

d) Safety Materials and Procedures

For fire and forest fire, carbon monoxide alarms, medical emergencies, first aid (accident or injury), building evacuations, shelter in place situations, suspicious or criminal activity, wildlife encounters, exposure to the elements, chemical or biological spills, utility shutdowns, missing persons, and accident and incident reporting emergency procedures, see the Emergency Response Plan & Contact Information. Additional information is provided below.

i. First Aid

The first aid kit is in the kitchen. If the first aid kit is used, please sterilize and/or restock materials.

ii. Carbon Monoxide

Though the risk of carbon monoxide poisoning is small with proper Station use, the potential effects are serious, ranging from headache and fatigue to death. To minimize this risk, smoking in the Station or within 7.5 meters of the Station is strictly prohibited. The Station is also a no idling zone.

Carbon monoxide is detected by the smoke alarms throughout the Station. Batteries are to be changed and tested yearly by Station staff.

2) IN THE LAB

a) General Lab Safety

i. Personal Health and Hygiene

Personal hygiene in the lab prevents unnecessary exposure chemical by minimizing routine contact with chemicals in the lab.

- Avoid direct contact with any hazardous chemical.
- Know the chemical you are working with and wear appropriate personal protective equipment (PPE).
- Do not inhale or 'sniff' chemicals.
- Assume chemical mixtures are more hazardous than their most hazardous component.
- Wash hands thoroughly with soap and water before and after working with chemicals.
- Never pipette by mouth.

To prevent the unintentional chemical exposure of others and the spread of chemical contamination, both in and out of the lab:

- Lab coats, gloves and lab shoes should not be worn outside the lab unless necessary. They should never be worn in eating areas, restrooms, or offices.
- Remove gloves before leaving the lab or handling objects such as phones, computer keyboards, and pens to prevent the potential spread of chemical contaminants.

ii. Housekeeping

Cluttered labs are detrimental to efficient work and a serious safety hazard. Keep areas clean, tidy, and free of unnecessary chemicals and equipment. Clean regularly and:

- Store equipment not in active use away from the work area.
- Clean equipment and glassware as soon as possible.
- Return chemicals to storage after use.
- Clean work surfaces regularly to prevent accumulation of dust and spilled chemicals.

- Keep the exit and floor unobstructed to allow for safe movement.
- Do not allow electrical cords or tubing for gas or water flow to trail across aisles.
- Clean up all spills immediately.
- Do not block access to emergency equipment and utility controls.
- Do not store boxes, excess equipment and personal belongings in the lab.
- Do not allow visitors, minors, or non-registered people into the lab without explicit permission from and registration through the Station Manager.

DO NOT bring food or drink into the laboratory as it significantly increases the risk of contamination. Do not store food or drinks in the laboratory refrigerator or freezer.

iii. Electronics

Do not take cell phones, pagers, etc. into the lab if at all possible as they may cause distractions that lead to lapses in concentration and lab accidents. Headphones, earbuds, etc. not being used specifically for research are not to be worn as they hamper communication. Music is not to be played in the lab above a volume level that hinders spoken communication.

iv. Emergency Spill Response Kits

In the event of a chemical or biological spill, there are Spill Kits in the wet lab. They are to be used only for spill cleanup and replenished when contents are used. They contain Spill Response Guidelines and clean-up materials.

b) Lab Apparel and Personal Protective Equipment

Proper choice of clothing and apparel help minimize risk of chemical exposure. Safety is your responsibility. Always wear PPE appropriate for your situation. You may require:

- A lab coat or apron.
- Safety goggles or safety glasses with side shields.
- Closed-toe shoes that fully cover your feet.
- Gloves – disposable reusable, or heat protection; made of specific materials.
- Respiratory protection.
- A full face shield

Remember to:

- Confine long hair and loose clothing.
- Avoid clothing that leaves large areas of skin exposed (shorts, tank tops, etc.).
- Not wear loose jewellery or rings that can damage protective gloves or make wearing/removing gloves difficult.

If you are unsure of the PPE you require, consult the appropriate MSDS(s).

c) Use of Lab Equipment

For more information on lab equipment or on different lab equipment, see Appendix 1.

i. Glassware

Glassware is frequently used in research and may be made of several different types of glass; select the appropriate glassware based on the application:

- Borosilicate glass (ex: Pyrex©, Kimax©) for thermal and mechanical shock use.
- Soft glass may be used for applications such as reagent bottles and glass tubing.
- For vacuum work, use only round bottom or thick walled borosilicate glassware designed to withstand low pressures.

Before beginning, check glassware for flaws that may result in structural failure. Note that repaired glassware is subject to thermal shock and subsequent failure; use with caution. Choose glassware sizes that can accommodate the operation. Leave 20% free space, minimum.

To prevent cuts from trying to force glass tubing into rubber/cork stoppers or tubing:

- Use appropriate hand protection and a soap solution, glycerine or other lubricant on the ends of glass rods or tubing before inserting into a stopper.
- Rod or tubing are inserted into the stopper with a turning motion - never forced.
- Always aim rod or tubing away from the palm of the hand holding the stopper.
- Ensure that the stopper hole is large enough to accommodate the rod or tubing.

Clean unbroken glassware can be disposed of in residence recycling. Clean broken glassware must go into the lab sharps container. Contaminated glassware must be disposed of as hazardous waste.

ii. Electrical Equipment

Electrical equipment in the lab may cause electrical shock or act as an ignition source for flammable or explosive chemicals. To minimize the possibility of these situations:

- All lab equipment is to be equipped with 3-prong grounded plugs.
- Place equipment to minimize the possibility of chemical spills on or under it.
- Inspect cords on a regular basis for frayed and/or damaged connections.
- Devices equipped with motors used where there are flammable vapours present should be either non-sparking induction or air driven motors.
- Note that on-off switches, rheostat type speed controllers, and similar devices can produce sparks every time they are adjusted.
- Unplug electrical equipment before making repairs or modifications.
- All electrical equipment must be CSA approved.

If electrical devices like stirrers and mixers are left unattended, they should be fitted with a suitable fuse or thermal protection device that will shut down the apparatus if necessary. For information on vacuum pumps and systems, see Appendix 1.

iii. Heat Sources

AMLRS may at times have hotplates and Bunsen burners. They should never be left unattended and Station users should always wear safety glasses when using heat sources. Never touch anything but the base or controls of a hotplate or Bunsen burner when they are turned on, or when they have recently been on.

Drying Oven

The Station contains a drying oven. Heat resistant gloves may be required in some instances when using the oven. If toxic vapours or gases may be released while using the oven, the vapours should be vented outside the building.

iv. Refrigerator and Freezer

The general purpose refrigerator in the lab and the ultra-low temperature freezer are to be used for lab storage only. **Do not keep food or drinks here.**

Containers must be adequately sealed to prevent build-up of toxic vapours. Aluminium foil, plastic wrap, corks and glass stoppers are unacceptable for the storage of volatile chemicals. Screw top caps with a seal inside are best suited for refrigerator storage. Chemicals and samples no longer needed must be appropriately disposed of.

d) WHMIS

*Note: For information on WHMIS, see Appendix 1 pages 6-12.

i. General Information

The Workplace Hazardous Materials Information System (WHMIS) is a program designed to inform workers, in this case Station users, of risks associated with hazardous materials.

For samples to be sent to another lab for analysis, see Appendix 1 for WHMIS labelling requirements. If a product will *only* be used in the Station lab, it needs:

- The name of the chemical
- Sample number
- Any other method that unequivocally identifies the substance

The same product identifier labelling applies to controlled products produced in the lab, reaction vessels, mixtures undergoing testing or analysis, and hazardous waste.

Note, however, that these simplified labels only apply as long as the controlled product is in the wet lab. Full worksite labels are required if a product is transferred elsewhere.

In all cases:

- Replace damaged or defaced labels.
- If chemical labels do not meet WHMIS label standards, update the label.

ii. Material Safety Data Sheets

The Station MSDSs are kept in a binder labelled 'Chemical Inventory & MSDS' in the server room. Chemical inventories and MSDSs are to be updated whenever new products are brought into or removed from the Station. MSDSs must always be less than three years old and contain:

- Hazardous Ingredients
- MSDS Preparation Information
- Product Information
- Physical Data
- Fire or Explosion Hazard
- Reactivity Data
- Toxicological Properties
- Preventative Measures
- First Aid Measures

MSDSs must be available for each hazardous material regulated under WHMIS that is present in the laboratory, except in the following cases:

- Chemicals from a supply house labelled with all the required MSDS information.
- Controlled products produced in the laboratory that will remain in the laboratory.
- Intermediate products in reaction vessels.

e) Chemicals

*Note: for more information on chemical use and safety, see Appendix 1.

In some cases, chemicals can be obtained from or delivered free of charge through the U of A Chemical Exchange program (only available to U of A staff). Consider obtaining chemicals through this program, or giving excess chemicals to this program.

i. Working with Chemicals

*Note: For more information on any aspect of Working with Chemicals, see Appendix 1, pages 13-18.

When working with chemicals, plan ahead to identify potential experiment hazards before beginning work. Minimize your exposure to chemicals through proper use of PPE and ventilation. Be prepared for accidents and familiarize yourself with applicable safety protocols.

For procedures on chemical spill responses, see the Emergency Response Plan & Contact Information section.

Report all chemical spills (see Appendix 4). These principles must be applied to all work involving chemicals in the laboratory.

Flammable and Combustible Liquids

The use of flammable and combustible liquids can be very hazardous. To minimize risk:

- Always wear the proper PPE.
- Never heat flammable liquids with an open flame.
- Handle flammable liquids in an ignition free area.
- Use appropriate ventilation to prevent a buildup of flammable/explosive gas mixtures.
- Keep containers of flammable liquids closed except during transfer of contents.

When working specifically with highly reactive and explosive chemicals, compressed gases, or air / water reactive chemicals, refer to Appendix 1.

Corrosives

Corrosive chemicals result in an immediate, acute erosive effect on body tissue. Strong acids and bases of 1M or greater concentration, non-metal halides, dehydrating agents, halogens, and oxidizing agents are all corrosive. When working with corrosive chemicals:

- Always add acid to water, not water to acid.
- Wear eye protection and gloves. Consider a face shield and acid resistant rubber apron.

Cryogenic Liquids

Cryogenic liquids (or cryogens) are liquids with a boiling point less than -73 degrees Celsius. When using cryogens:

- Wear full coverage clothing that cannot catch spilled liquids (no pockets, pouches, etc.).
- Hand jewellery should not be worn (they may freeze to the skin).
- Use insulating gloves that are impervious to liquid but loose fitting so they can be thrown off quickly if liquid spills in them.
- Wear safety glasses or a face shield.
- Only use materials designed for low temperatures; other materials may become brittle.
- Store and transport cryogens in pre-cooled Dewar flasks designed for that purpose.
- When using cold traps, ensure they do not become plugged with frozen material.

For more information on cryogens, see Appendix 1 page 17.

ii. Storage of Chemicals

*Note. For more information on the Storage of Chemicals, see Appendix 1, pages 19-24.

Chemical Inventory

The Station chemical inventory (including hazardous materials) is kept in a binder labelled 'Chemical Inventory & MSDS' in the server room. Chemical inventories and MSDSs are to be updated whenever new products are brought into or removed from the laboratory. The information contained in the chemical inventory must include:

- Name of Chemical.
- Date Received.
- Storage Location.
- Approximate Amount.
- MSDS Availability.

Storage of Laboratory Chemicals

Chemicals must be stored in the Station wet lab, and must be stored according to chemical compatibility; incompatible materials must not come in contact with each other in the event of breakage or accidental spill. Segregate chemicals in this way:

- Perchloric Acid, Hydrofluoric Acid, and Concentrated Nitric Acid are separated from all other materials (including each other).
- Inorganic acids can be stored together (except as noted above).
- Store organic and inorganic acids separately
- Store strong acids and bases separately.
- Bases can be stored together.
- Water reactive chemicals can be stored together.
- Pyrophoric chemicals can be stored together.

- Strong oxidizing agents can be stored together.
- Strong reducing agents can be stored together.
- Flammable and combustible liquids can be stored together.
- Store solids and liquids separately.
- Separate chemicals using glass, porcelain or heavy gauge Nalgene© or a similar plastic container that is compatible with the material being stored if chemicals cannot be stored in physically separate locations.

Refer to the MSDSs in the 'Chemical Inventory & MSDS' binder in the server room for information about the hazards or possible incompatibilities of a chemical before storing or using chemicals.

In addition:

- Do not store chemicals near the exit, under the sink, or directly on the floor.
- Keep bottles below eye level. Large containers should be stored close to the floor.
- Store chemicals according to instructions on the label or MSDS (i.e. should it be stored in the refrigerator, freezer, away from direct sunlight, etc.).

Flammable and Combustible Liquids

Flammable and combustible liquids must be stored carefully. The permitted volume of flammable and combustible liquids is regulated by the Alberta Fire Code; the maximum volumes of such liquids permitted in the AMLRS lab are:

- 25L of Flammable or Class I Liquids.
- Containers of flammable and combustible liquids must not exceed a capacity of 5L. Exception: ULC approved safety cans, which may be up to 25L in volume.
- Note that flammable or combustible waste must be included in this volume.

Nearly all common non-halogenated organic solvents (e.g.. ethanol, methanol, hexane, diethyl ether, toluene, etc.) count as flammable liquids. Some combustible liquids commonly found in labs include acetic acid, dimethylsulfoxide, N, N-dimethylformamide, formalin solution, and phenol.

If possible, limit volume to a one week supply or a single container of each required flammable or combustible liquid, whichever is less.

For information on ethers, other peroxide forming chemicals, perchloric acid and perchlorates, see Appendix 1. **No lab procedures may involve heating perchloric acid.**

iii. Hazardous Chemical Waste Management

*Note. For more information on any aspect of Hazardous Chemical Waste Management, see Appendix 1, pages 25-28.

The indiscriminate disposal of hazardous lab waste down the drain or with the regular lab trash is **unacceptable**. It is harmful to people and the environment, as well as illegal under the Alberta Environmental Protection and Enhancement Act. Hazardous chemical waste at AMLRS is to be stored in proper containers until pickup can be arranged. The U of A Hazardous Waste Management System provides hazardous waste disposal service to University labs.

Defining Hazardous Waste

Alberta Environmental Protection and Enhancement Act - Waste Control Regulation, defines hazardous waste as solids, liquids or gases containing or contaminated with:

- Flammable or combustible liquids (e.g. acetone, methanol, dichloromethane).
- Reactive chemicals such as oxidizers, reducing agents, cyanides, water-reactive, pyrophoric, explosive or unstable material (e.g. benzoyl peroxide, potassium permanganate, sodium borohydride).
- Acute or chronic toxic material (e.g. ethidium bromide, benzene, osmium tetroxide)
- Corrosives (pH less than 2.0 or greater than 12.5).
- Toxic leachate materials (e.g. heavy metals).
- Polychlorinated biphenyl's (PCB's)
- Unrinsed chemical containers which contained one of the above.

These materials will not be collected by the Hazardous Waste Management System:

- Non-returnable gas cylinders (i.e. lecture bottles). Dispose of these through the original supplier, or through a commercial hazardous waste contractor.
- Hazardous materials restricted for transportation under the Transportation of Dangerous Goods Regulation. These must be treated on site by a hazardous waste contractor.

To minimize risk and reduce chemical waste:

- Order and use the smallest possible amount required.
- Use dilute solutions whenever possible.

Handling and Storage

All precautions followed when handling, storing and using lab chemicals apply to hazardous waste. Some specific points to keep in mind:

- Keep the exterior of the container free of chemical contamination.
- Segregate by chemical compatibility.
- Leave at least 20% air space in bottles of liquid waste.
- Dispose of hazardous waste regularly to avoid accumulation in the laboratory.

Waste containers must be closed at all times, except when contents are being added. Do not leave filter funnels in the open necks of containers.

Wastes should be separated as follows:

- Separate liquid and solid waste.
- Separate liquid organic waste from liquid aqueous waste.
- Separate strong acids and bases from other aqueous waste.
- It is not necessary to separate halogenated from non-halogenated waste.

For information on labelling, packaging, and pickup of hazardous waste, see Appendix 1. Waste generators are responsible for the proper disposal of their own waste. Unidentified waste will not be collected.

Special Wastes - Sharps

All needles and similar sharps are treated as biohazardous waste. Do not re-cap needles. Do not use a guillotine type cutter to clip the needle. These and other sharp objects (including broken glass) should be placed in the sharps disposal unit in the wet lab.

f) Biological Materials

*Note: for information on biological materials registry, use and safety, see Appendix 2.

i. General Information

Biological material research often includes the use of chemicals; review the section on chemicals to improve safety for yourself and other Station users, as applicable.

The U of A is a major centre for research involving biohazardous agents, which include: pathogenic microbes (i.e., viruses, bacteria, fungi, eukaryotic parasites, etc.) that can cause disease in humans, animals and plants; eukaryotic cell lines; biological toxins and venoms; human clinical specimens and body fluids; animal tissue specimens; genetically modified organisms (recombinant DNA (rDNA) constructs); viral-based recombinant vector systems; infectious RNA; large-scale cultures (> 10L); and plant, animal and insect species not indigenous to Alberta. All biological research specimens acquired from the environment and brought into the laboratory for analysis, processing, or storage must have a biohazard assessment.

All individuals or groups conducting research involving biohazardous agents using AMLRS must register with the Biosafety Division. See Appendix 2 for details**. Failure to do so leaves the researcher open to liability and penalty**. All personnel working with biohazardous materials must document their reading and understanding of the Biohazard Guidelines (see Appendix 2).

The following Safety Protocols present a brief overview of some key protocols that may be used in the Station. It is by no means exhaustive. Refer to Appendix 2 for more details.

ii. Hazard Assessment

Federal biosafety regulations require all research and teaching groups working with biological agents to conduct a hazard assessment of their planned activities prior to initiating work to determine if any of the material is considered a biohazardous agent.

All biological research specimens acquired from the environment and brought into the laboratory for analysis, processing, or storage must have a biohazard assessment. Risk Group categories will be assigned based on microbe abilities to cause diseases in living organisms. Higher RG categories represent higher risk.

- All human clinical and body fluid specimens are considered RG-2 agents.
- Categorization of animal tissue and body fluid specimens is dependent on species and location of collection. For example, rodents are common vectors for a large number of human and animal pathogens, yet a blood specimen collected from a captive breed mouse (RG-1) can be considered safer than a blood sample collected from a feral mouse (RG-2) caught in the wild.
- Categorization of environmental specimens is dependent on the location of collection. If the location has a known history of association with an infectious disease (i.e., a river involved in repeated outbreaks of a waterborne illness) or show signs of contamination with suspect organic material (i.e., water collection immediately downstream of a sewage effluent pipe), the specimens are RG-2.
- For all epidemiological or ecological studies investigating the presence of a biohazardous agent, all animal, plant, insect, and environmental specimens collected for the study are considered RG-2 agents.

Higher RG specimens require higher lab containment levels. AMLRS is currently at containment level 1. Research projects requiring higher containment levels may still be accommodated by altering the AMLRS lab; discuss this with the Station Manager.

iii. Cleaning and Decontamination

All work surfaces and equipment used with biological material (whether or not it is considered a biohazardous agent) must be kept clean and regularly wiped down with an appropriate chemical decontaminant. Under no circumstances may untreated waste potentially contaminated with biohazardous agents be disposed of into the regular building waste stream. Pouring untreated, active cultures of any microbe or eukaryotic cell line down the sink is prohibited.

The most common chemical decontaminants recommended for use in U of A research and training laboratories are 70% Ethanol, 2% Virkon, and 10% bleach.

Once used, these three decontaminant solutions may be poured down the sink, provided the drain is then flushed with copious amounts of water. For disposal of other chemical decontaminants, consult their MSDS.

AMLRS has no autoclave. Refer to the hazardous waste section and Appendix 2 for disposal details.

iv. Medical Surveillance and Emergency Response Plan

Station users are responsible for monitoring their personal health. Those working with biohazardous agents causing infectious disease or toxigenic effects in humans must read the PSDS or MSDS associated with the biohazardous agent and must be aware of the potential exposure routes through which the biohazardous agent can gain entry into the body. They must self-monitor their own health for symptoms of disease associated with the biohazardous agents they are handling. If infection is suspected, seek medical attention and identify to the attending physician the biohazardous materials you are working with.

Do not work with biohazardous material if you are sick, pregnant, or immunocompromised due to medication or other conditions. Get vaccinated against the potential health risks of the material you are working with.

Report all injuries, accidents, near injuries or accidents, and potential exposures with the Incident Report Form (Appendix 4).

v. Biological Spill Remediation Protocol

All spills of biological material occurring in a laboratory must be remediated. Even if the material involved was not a biohazardous agent, improper remediation can result in biological material being left behind to disrupt or ruin research.

AMLRS has a Biological Spill Kit in the lab. It is to be used for biological spills only, and replenished when items are used.

g) Working Alone

Avoid working alone- "to work alone at a work site in circumstances where assistance is not readily available in the event of an injury, illness or emergency (Occupational Health & Safety Code),"- when possible as it is considered a hazard.

- Operations must be assessed for safety hazards and a written Working Alone Protocol be completed prior to working alone.
- Safety measures must be taken to reduce or eliminate the hazards identified.
- A communication system must be established or appropriate procedures developed so a person working alone can contact aid in an emergency.
- You must be trained in any procedures developed to manage working alone.

Working alone protocols must be developed if you have the possibility of working alone. This should be developed with the Station Manager before you begin working at the Station. For further reference, see Appendix 3.

h) Laboratory Closeout and Clearance to Work in Laboratories (Maintenance, Repairs, and Renovations)

When leaving AMLRS at the end of your research project:

- All Station equipment and materials must be clean, decontaminated, properly labelled and replaced in their designated positions.
- All personal equipment, including chemicals, samples, hazardous materials, etc. must be cleared out.
- Surfaces including tables and counters must be cleaned and decontaminated.
- Hazardous waste must be appropriately disposed of.

The same procedures must be followed by all researchers before construction or renovations take place in the lab. Notice will be given.

3) IN THE KITCHEN/DINING AREA

While AMLRS is dedicated to providing a quality research facility, the safety of its occupants and the surrounding area is still top priority. As far as living quarters go, kitchens in particular provide hazardous areas as they contain bacteria, high heat, water, electricity and sharp objects in close proximity. To make AMLRS safer for yourself and others, follow these safety protocols.

a) Organization and Cleanliness

The limited size of the Station makes housekeeping even more essential in reducing risk.

- Wipe down and sanitize counters after use.
- Empty garbage and recycling bins when they are full.
- Keep tables and counters free of clutter.
- Keep personal items, marked with your name, stored neatly in proper space(s).
- Return things to their proper location when you are finished with them.
- Ensure walkways and floor space are clear of obstructions and tripping hazards.
- Immediately clean up spills and pick up dropped items.
- Keep flammable objects away from the stove.

You may be charged additional fees for leaving a mess when you leave the Station.

b) Food

Take care when preparing food, eating, and cleaning.

- Always wash your hands before and after handling food, and immediately after handling raw meat, fish, poultry or eggs.
- Avoid cross contamination of raw meat, fish, poultry or eggs with other foods by thoroughly washing preparation dishes that have been in contact with those foods.
- Do not leave cooking food unattended.
- Wash food preparation cookware (pans, spatulas, can openers, knives, etc.) soon after they are no longer in use. Take specific care when washing knives or items with sharp blades/edges.
- Refrigerate perishable foods after no more than 2 hours at room temperature.
- Dispose of leftovers after no more than 4 days in the refrigerator.
- Regularly remove food items from the refrigerator and cupboards when they go bad, or you leave the Station for a period of time in which they will go bad.
- Mark food with your name and the date if it will be around for 5+ days.

c) Appliances

- Never use appliances with damaged cords.
- Unplug all appliances before cleaning them.
- Be careful when using the stovetop and oven; never touch stovetop burners, and always use oven mitts when putting food into or removing food from the oven.
- Ensure the stovetop and oven are turned off when you are finished with them.
- Clean the stovetop and any spills in the oven once the stove is completely cooled.
- Be careful when lifting lids from hot food to avoid steam scalding.

d) Wood Stove

Do not use the wood stove if you do not know how to do so safely.

- An axe is available. Do not use it if you do not know how to safely do so.
- Never store more wood in the Station than fits in the firewood storage area.
- Keep combustible materials away from the wood stove.
- Never touch the wood stove while it is burning or soon after it has been burning.
- Clean out ashes on a regular basis when they and the wood stove are cold.

4) FIRE PIT AND PICNIC TABLE USE

Fire pits, while enjoyable, can be dangerous if used improperly. Ensure that fire bans are not in place before attempting to use the fire pit and remember that larger fires present larger risks; keep the fire small enough to easily manage.

- Never attempt to start a fire outside the designated fire pit or in high winds.
- Never use lighter fluid, gasoline, or kerosene to light a fire.
- Have a bucket of water nearby big enough to drown the fire if necessary.
- An axe is available. Do not use it if you do not know how to safely do so.
- Do not burn garbage in the fire pit.
- Do not touch or put feet/shoes on the fire pit while in use or soon after.
- Keep flammable materials away from the fire pit.
- Never leave a fire unattended; make sure the fire is completely out before it is left.

Use the picnic table respectfully to ensure your own safety and the safety of others.

- Clear the table after use.
- Clean the table if needed, especially if foods were spilled on it.
- Do not sit or stand on the tabletop.

PART 2: SAFETY PROTOCOLS IN THE FIELD

Fieldwork represents a significant portion of research time as well as risk involved in the research process. This section of safety protocols is by no means exhaustive or applicable to every fieldwork project, but it is a place to begin planning safer fieldwork. Below are some actions you can take to reduce your risk of fieldwork-related accidents and injuries.

- Know as much about the area you are going into as possible. Do research. Examine maps. Ask Park staff.
- Complete and utilize Field Activity Plans, Hazard Assessments, Working Alone Protocols and Communication Plans.
- Bring sunscreen and a hat. Regardless of the season or direct sunlight, you can burn.
- Bring water and high energy food; stay hydrated and energized.
- Wear weather and activity appropriate clothing.
- Wear proper footwear; closed-toe shoes, rubber boots, winter boots, hiking shoes, etc.
- Remove your garbage, equipment, and all other materials from the field on a daily basis unless your research specifically requires otherwise (ex. wildlife cameras or temperature gauges that have to be left for extended periods of time). Leave no trace of your work when you are finished with your data collection.
- Physical and mental exhaustion can seriously impair judgement and safe fieldwork capability. Make sure you are well rested before conducting fieldwork.

1) Personal Protective Equipment

Having the proper PPE for fieldwork is essential in reducing risk. As research projects and length of time in the field will vary greatly, so will PPE for each project. Depending on your personal fieldwork, you may require:

- An area or trail map and compass; GPS and spare batteries
- Whistle
- Basic first aid kit
- Sunglasses/safety glasses
- Multi-tool/jackknife
- Sunscreen, insect repellent, and bear/pepper spray
- Radio, cell phone, or satellite phone

2) First Aid

A knowledge of basic first aid can be extremely useful in the event of accident or injury during fieldwork. Courses offering basic first aid training or specific field first aid are frequent (in Edmonton) and inexpensive when compared to the risk cost of not being

able to help yourself or someone else in the event of a fieldwork injury; taking such a course is highly recommended.

When performing fieldwork, bring a small first aid kit for minor accidents or injuries that contains bandages, adhesive tape, scissors, tweezers, and antiseptics, at minimum. Add other supplies if they apply to your specific situation (ex. cream for bug bites, antihistamines, etc.) and remember to sterilize and/or resupply items as needed.

3) Fire

Do not start fires of any kind outside of a fire pit or AMLRS wood stove without explicit permission from the Station Manager and a Conservation Officer as it is illegal to do so in Provincial Parks and can also be extremely dangerous. Do not discard cigarette butts or other possible fire starting agents in the Park, even if they are fully extinguished; take them with you and remove them from the Park.

See the Emergency Response Plan and Contact Information section for fire safety and emergency protocols.

4) Wildlife

Unless directly related to your research and with explicit permissions, never attempt to capture, approach, feed, or touch a wild animal. It can be potentially dangerous to you, exposing you to parasites, diseases, viruses, and sudden attack. It also exposes those animals to germs you may be carrying, may increase stress, and may cause shock and/or other physical or biological injury. Human presence may make wild animals more likely to encounter humans again, putting other people and those animals at future risk.

Though hunting is not legally allowed in Provincial Parks, peripheral areas and areas more favourable to poachers (off-trail and away from main facilities) may be less safe. Always wear conspicuous clothing when working off-trail or near peripheral areas of the Park, especially during hunting season. Report suspected hunting and poaching actions to the Park.

The best approach to all potentially dangerous wildlife is to avoid encountering them. For safety protocols on how to respond to wildlife encounters, see the Emergency Response Plan & Contact Information section.

5) Water Safety

When using Station watercraft or participating in other water-based activities:

- Wear a personal flotation device with an attached whistle.
- Be aware of others in the water nearby and ensure they are aware of you.
- Check weather conditions prior to working in water and avoid being in water during storms, particularly when there is lightning, even if the storm is not directly overhead.
- If you are going to be in the water for an extensive period of time or when the water is comparatively cold, consider wearing chest waders or a dry-suit.

Be aware that working in water increases the rate of heat loss and the chance of hypothermia. If you or someone around you shivers continually, shows signs of slow or uncoordinated movements, or displays confusion or slowed responses, immediately get them out of the water. Remove wet gear or clothing and keep them warm. Seek medical attention if symptoms don't abate quickly.

If working on ice, ensure the ice is thick and solid enough to support you and all of your equipment (minimum 15 cm for a single person). Avoid areas where objects protrude from the ice, the ice is grey, or where water is sitting on top of the ice as they may be weak points.

6) Weather

*Note: For more information on weather related work hazards and safety, see Appendix 5. See the Emergency Response Plan & Contact Information section for weather-related emergency response details.

Weather can change quickly and unexpectedly, and has a significant impact on the human body. To reduce personal risk brought about by weather, be prepared for many conditions.

a) General:

- Check the weather forecast before you go out to know what to expect
- Be prepared for weather changes. Wear or pack layers, potentially including rain or snow gear, sunglasses or tinted safety goggles, and sunscreen.
- Always bring water and high energy food. High winds, rain or snow can slow your progress, make fieldwork more tiring, and extend your time in the field.

b) In Heat:

- Bring extra water and stay hydrated by drinking at regular intervals
- Wear a hat and waterproof sunscreen. Add sunglasses if necessary.

- Wearing light coloured clothing made of a light, breathable material that covers most of your body will reduce the risk of heat-illnesses and sunburn.
- Be prepared for insects. Wear clothing that covers most of your body and bring insect repellent, particularly when working off-trail or near water.
- If possible, avoid working during the hottest parts of the day in the summer.

Overheating presents serious risk to personal safety. Symptoms may be mild swelling or tiny red spots, but can escalate quickly to dizziness, headaches, coma or death.

The Centre for Disease Control and Prevention 'Heat and Outdoor Workers' page can be found at http://www.cdc.gov/extremeheat/workers.html.

c) In Cold:

Alberta weather can be harsh. Unexpectedly cold weather, high winds, rain and snow storms are possible year round. Even outside of the winter season, temperatures above freezing but below core body temperature can significantly affect your body.

- Plan ahead. Map out a route and a rough timeline, and inform someone of them.
- Wear layers of clothing. Wear or pack gloves/mitts, a toque/warm headgear, a wind and waterproof jacket, ski pants, insulated boots, etc. as appropriate.
- Anticipate and be prepared for wind chill.
- Bring hot fluids (ex. decaffeinated tea or coffee, soup - avoid caffeine) in insulated containers in addition to water and high energy food.
- Add a hand powered or cold weather flashlight to your first aid kit as light fades early and quickly in winter evenings.

Cooling presents as many and as serious risks to your safety as overheating. Symptoms range from shivering and numbness to immobility, unconsciousness, and death

d) In a Rain, Thunder, Hail or Snow Storm:

If at all possible, fieldwork on days when storms are likely should be avoided. Check weather reports to reduce your risk of getting caught in a storm. If you are out of the Station when a storm hits:

- Get out of any water immediately, especially if you are in the lake.
- Return to the Station as quickly as possible. Take equipment with you only if it is safe to do so. Otherwise, try to leave it in a protected area.
- Ensure Station doors and windows are closed.
- Unplug electronics without surge protection *before* the storm arrives to prevent potential sparking. Do not unplug electronics or touch outlets *during* storms.
- Remain indoors until the storm has passed.

APPENDICES

APPENDIX 1
CHEMICAL INFORMATION

University of Alberta Laboratory Chemical Safety Manual
http://www.ehs.ualberta.ca/DocumentsandProcedures/~/media/C6A14F12C9F14BB19C910A37936EA897.ashx

University of Alberta Chemical Safety Plan
http://safety.eas.ualberta.ca/forms/Chemical_Safety_Plan.pdf

University of Alberta Working with Air & Water Reactive Chemicals
http://www.ehs.ualberta.ca/EHSDivisions/~/media/Environmental%20Health%20and%20Safety/Documents/Chemical%20Safety/Working_with_Air__Water_Reactives__Final.ashx

APPENDIX 2
BIOLOGICAL INFORMATION

University of Alberta Environment, Health & Safety: Biosafety Guidelines
http://www.ehs.ualberta.ca/EHSDivisions/~/media/Environmental%20Health%20and%20Safety/Documents/Biosafety/Biosafety_Guidelines.pdf

APPENDIX 3
WORKING ALONE PROTOCOL

Augustana Miquelon Lake Research Station Working Alone Procedures
http://www.augustana.ualberta.ca/files/group/4989/Working%20Alone%20Policy.pdf

APPENDIX 4
REPORT FORMS

The following forms can be found at
http://www.ehs.ualberta.ca/en/ReportAnInjuryIncident/PersonalInjury.aspx

- **Incident & Investigation Report Forms**
- **First Aid Reports**
- **WCB Worker's Report**
- **WCB Employer's Report**

APPENDIX 5
WEATHER HAZARDS AND SAFETY

Best Practice – Working Safely in the Heat and Cold
https://work.alberta.ca/documents/WHS-PUB_GS006.pdf