



# Department of Physics and Astronomy

# Safety Manual

# Department of Physics and Astronomy Safety

## Safety Committee Members

Head

Associate Head

P. Wang

One other faculty member (see current Departmental Committees list)

## Working Alone Procedure

- Working Alone or in Isolation – Risk Assessment  
[www.umanitoba.ca/admin/governance/media/workingalone\\_appendixA.pdf](http://www.umanitoba.ca/admin/governance/media/workingalone_appendixA.pdf)
- Working Alone or in Isolation – Safe Work Procedures  
[www.umanitoba.ca/admin/governance/media/workingalong\\_appendixB.pdf](http://www.umanitoba.ca/admin/governance/media/workingalong_appendixB.pdf)

## Laboratory Safety

- Combined Laboratory Inspection Program (CLIP)  
[www.umanitoba.ca/admin/human\\_resources/ehso/rad\\_safety/Clip2.html](http://www.umanitoba.ca/admin/human_resources/ehso/rad_safety/Clip2.html)
- Basic Laboratory Safety Training Requirements  
[www.umanitoba.ca/admin/governance/media/labsafety\\_app1June4\\_07.pdf](http://www.umanitoba.ca/admin/governance/media/labsafety_app1June4_07.pdf)
- Recommended Lab Safety Training Topics  
[www.umanitoba.ca/admin/governance/media/labsafety\\_app2june4\\_07.pdf](http://www.umanitoba.ca/admin/governance/media/labsafety_app2june4_07.pdf)
- Laboratory Safety Checklist for New Lab Personnel  
[www.umanitoba.ca/admin/human\\_resources/ehso/images/Laboratory\\_Safety\\_Checklist\\_for\\_New\\_Lab\\_Personnel\\_revised\\_Dec\\_13\\_07.doc](http://www.umanitoba.ca/admin/human_resources/ehso/images/Laboratory_Safety_Checklist_for_New_Lab_Personnel_revised_Dec_13_07.doc)
- Laboratory Self-Inspection Checklist  
[www.umanitoba.ca/admin/human\\_resources/ehso/media/CLIPInspectChecklistDec06.pdf](http://www.umanitoba.ca/admin/human_resources/ehso/media/CLIPInspectChecklistDec06.pdf)

## Laser Safety

- Control Measures for Class 3b and 4 Lasers  
[www.umanitoba.ca/admin/human\\_resources/ehso/images/Control\\_Measures\\_for\\_Class\\_3b\\_and\\_4\\_lasers\\_June\\_4\\_07\\_numbered.doc](http://www.umanitoba.ca/admin/human_resources/ehso/images/Control_Measures_for_Class_3b_and_4_lasers_June_4_07_numbered.doc)

## Fire Safety

- General Fire Emergency Procedures  
[www.umanitoba.ca/admin/human\\_resources/ehso/media/GenFireProcedure070919.pdf](http://www.umanitoba.ca/admin/human_resources/ehso/media/GenFireProcedure070919.pdf)
- Fire Safety Plan – Allen Building (includes the Department of Physics and Astronomy Fire Warden List)



**WORKING ALONE OR IN ISOLATION      RISK ASSESSMENT**

FACULTY/DEPARTMENT: \_\_\_\_\_

SUPERVISOR: \_\_\_\_\_ PHONE: \_\_\_\_\_ E-mail \_\_\_\_\_

WORKER'S NAME(S) and/or POSITION  
CLASSIFICATION \_\_\_\_\_

Work Description \_\_\_\_\_

Hours of work/shift \_\_\_\_\_

**Identify hazardous activities the worker may perform while working alone or in isolation:**

HEAVY PHYSICAL LABOUR	WORK WITH POWER TOOLS
WORK AT HEIGHTS	WORK WITH ANIMALS
WORK WITH HEAVY MACHINERY	WORK WITH EQUIPMENT UNDER PRESSURE OR VACUUM
ELECTRICAL WORK	ISOLATED WORK LOCATIONS
OTHER (DESCRIBE)	

**Identify hazardous substances the worker may work with, transport or handle while working alone or in isolation:**

LAB CHEMICALS	PESTICIDES	PRESSURIZED GASES
PATHOGENS	HAZARDOUS WASTE	INDUSTRIAL CHEMICALS
INFECTIOUS AGENTS	LASERS	NUCLEAR SUBSTANCES
OTHER (DESCRIBE)		

**First Aid Kit**

Is a personal first aid kit required for the worker who works alone?

(Worker does not have ready access to a standard first aid kit as required to be provided under subsection 5.12(1) of MR 217/2006).

Yes \_\_\_ No \_\_\_

**OVERALL RISK CLASSIFICATION OF WORK:**

     **Low**

(minimal hazard with respect to the activity and the work environment. Normally check-in and check-out with contact person at beginning and end of work shift. Examples: office work, report writing, etc.)

     **Medium**

(minor hazards with control measures in place to control risk. Requires more regular contact or work site monitoring. Examples include custodial duties, laboratory work with low hazard materials, light duty maintenance )

     **High**

(significant hazards and higher risk potential for injury/illness. Requires another worker/supervisor in close proximity with ability to make immediate contact. Examples: laboratory work with hazardous controlled products,



**WORKING ALONE OR IN ISOLATION      SAFE WORK PROCEDURES**

FACULTY/DEPARTMENT \_\_\_\_\_

SUPERVISOR: \_\_\_\_\_ PHONE: \_\_\_\_\_ E-mail \_\_\_\_\_

WORKER'S NAME(S) and/or POSITION  
CLASSIFICATION \_\_\_\_\_

Work Description \_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

Hours of work / shift \_\_\_\_\_

**1. Document actions taken to eliminate or reduce the hazards identified in the risk assessment.**

Hazards	Actions

**2. Communication System Requirements : (describe)**

Radio communication \_\_\_\_\_

Phone or cellular phone \_\_\_\_\_

Other means that provides effective communication

- Regular security patrol?
- Alarm system to security services?
- Regular visit by co-workers?
- Others? Specify \_\_\_\_\_

Maintaining regular contact with the person working alone or in isolation \_\_\_\_\_

**3. Identify any Prohibited Activities**

**4. Identify Training And Instruction Required**

<ul style="list-style-type: none"><li><input type="checkbox"/> WHMIS</li><li><input type="checkbox"/> TDG</li><li><input type="checkbox"/> Respiratory Protection</li><li><input type="checkbox"/> Infection Control</li><li><input type="checkbox"/> Lab Safety</li><li><input type="checkbox"/> First aid &amp; CPR</li><li><input type="checkbox"/> Fire extinguisher training</li><li><input type="checkbox"/> Health and Safety Orientation</li><li><input type="checkbox"/> Radiation Safety</li></ul>	<ul style="list-style-type: none"><li><input type="checkbox"/> Emergency Procedures</li><li><input type="checkbox"/> Supervision and Safety</li><li><input type="checkbox"/> Ladder safety</li><li><input type="checkbox"/> Other (describe)</li></ul>
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**5. Emergency and survival supplies required for traveling/working under extreme conditions ?**

**6. First Aid supplies/requirements ?**

SIGNATURE OF THE SUPERVISOR:

\_\_\_\_\_

SIGNATURE OF THE WORKER(S)

\_\_\_\_\_

SIGNATURE OF THE WORKER REPRESENTATIVE (LAHSC Worker Co-Chair)

\_\_\_\_\_

## APPENDIX 1 - Basic Laboratory Safety Training Requirements

### 1. General Provisions

- The PI is responsible for ensuring that new workers and students have completed the generic Basic Lab Safety and Workplace Hazardous Materials Information System (WHMIS) presentation and departmental WHMIS and Lab Safety Test preferably before starting work in the lab. The test to be reviewed by the WHMIS coordinator and the training is to be documented and records kept.
- The PI or a competent designate is to review and document training of site specific issues using the *Laboratory Safety Checklist for New Lab Personnel* form attached. The PI and new employee/students signatures are required and are to be kept in the Departmental office.
- The Environmental Health and Safety Office is to provide the Basic Lab Safety and WHMIS presentation on the EHSO web site to include a lab safety requirements section with policy/safety requirements for working in a lab, PI responsibilities, the Basic Lab Safety and WHMIS presentation, recommended training requirements for working in labs, suggested training topics and *Laboratory Safety Checklist for New Lab Personnel*.

### 2. Training Requirements For Working Or Studying In Laboratories

	<b>Who</b>	<b>When</b>	<b>What</b>	<b>Other Comments</b>
1	Principal Investigator ("PI")	<u>Within first month</u> of starting in the laboratory	EHSO to provide mandatory ONE hour 'face-to-face' safety requirements and responsibility orientation to new PI's with wet lab.	Administration to identify process whereby EHSO is notified in a timely manner of all new researchers with lab responsibilities
2	Students, technicians, research associates, and others working in research labs	<u>Mandatory</u> before starting work in the lab	1) 1.5-2.5 hour Basic Lab Safety WHMIS and generic orientation, to include a meaningful testing. (See attached Appendix 2 Part A and " <i>Basic Lab Safety and WHMIS</i> " on CD or EHSO web page)  2) PI or qualified designate goes through EHSO developed lab-site-specific checklist. (See Appendix 2 Part B and <i>Laboratory Safety Checklist for New Lab Personnel</i> )	<ol style="list-style-type: none"> <li>1. Sub-committee has developed an introductory Basic Lab Safety presentation with a generic WHMIS component.</li> <li>2. Recommendation is that this presentation will be maintained on the EHSO web-site. Departments will be able to maintain their own version with additional departmental specific information as well</li> <li>3. Important aspect of this recommendation is that it would be the WHMIS coordinator's responsibility to mark and review the answers with each person to ensure comprehension of the material. This is documented on</li> <li>4. Training checklist signed by WHMIS Coordinator, PI and new personnel and maintained in departmental office</li> </ol>
3	Staff working with Biological Material	<u>Scheduled quarterly</u>	Biosafety Cabinet usage - 1 hour  Generic Biosafety -1 hour	Provided By EHSO
4	All staff	<u>Annually</u>	Retesting based on updated content/presentation.	WHMIS coordinator to update presentation annually

## APPENDIX 2 - Recommended Lab Safety Training Topics

A = Topics for Generic WHMIS and Lab Safety Orientation as included in “*Basic Lab Safety and WHMIS*” Power Point presentation developed by the BCSC sub-committee on training.

B = Suggested Topics for Lab Site Specific Orientation by PI or qualified designate as included in “*Laboratory Safety Checklist for New Lab Personnel*”

TOPIC	Sub-topic	Training Option
WHMIS generic	MSDS	A,
	labeling	A
	Department specific implementation procedures - e.g. MSDS location , responsibilities	A, B,
Waste disposal	Chem	A, B,
	Biological	A, B,
Safe storage	flammable storage cabinet usage/locations	A,
	explosion proof fridge usage/location	A
Lab Hygiene	handwashing	A, B,
	Food consumption and storage	A, B,
Personal Protective Equipment	lab coats, gloves safety eyewear, footwear, etc.	A, B,
Respirators	determine requirement and describe program	B
Fumehoods/biosafety cabinets	Safe use and operation	A
Emergency Response	safety showers, eye wash, fire extinguishers, spill kits, 1st aid, 555, no caretakers do spill clean-up	A, B
Immunization	Requirements, needle-sticks and incident forms,	A, B
Incident Investigation	Reporting incidents and accident investigation,	A, B
Knowledge of Supports	EHSO, WHMIS coordinators	A
Knowledge of Supports	Safety Legislation – Due Diligence	A
Working Alone/Isolation	After hours- unattended operations ,Working alone protocols, personal safety	A/B
Site specific information relative to research project	chem/bio/rad/ other hazards	B
Hazard Signage	Departmental specific hazard signs	A, B

## Laboratory Safety Checklist for New Lab Personnel

Revision December 13, 2007

- PI/Lab Supervisor should discuss the following statements/questions with the new lab personnel before they start work in the laboratory.
- When completed and all signatures have been obtained, the checklist should be submitted to and kept by the departmental office

**Please Print**

<b>Name:</b>	<b>Date:</b>
<b>Phone #:</b>	<b>Department:</b>
<b>Principal Investigator/Official Supervisor:</b>	<b>Building and Room #</b>
<b>Biosafety Permit #</b>	<b>Radiation Safety Permit #</b>

The questions on page three can be used as a template for discussion in conjunction with the questions below.

YES	N/A	STATEMENT/QUESTION	
		1	PI/Supervisor has discussed the nature of the research/project being conducted in the laboratory.
		2	PI/Supervisor has discussed hazardous components of the research including reference to the following as applicable.
			a. Chemical
			b. Biological
			c. Physical (including temperature, electrical, lifting/ergonomic, hi/low pressure, sharps)
			d. Radioactive Materials
			e. Radioactive Emitting Devices (REDs or X-ray Equipment)
			f. Lasers (refer to EHSO's Laser Safety web page and Laser Safety Information Power Point at: <a href="http://www.umanitoba.ca/admin/human_resources/ehso/rad_safety/lasers.html">http://www.umanitoba.ca/admin/human_resources/ehso/rad_safety/lasers.html</a> )
		3	PI/Supervisor has identified the location of Material Safety Data Sheets (MSDS) and chemical inventories to the employee/student and demonstrated methods of access.
		4	Immunization requirements have been identified and offered if the employee will be working with/near vaccine-preventable human or animal pathogens or potentially infectious material. Contact EHSO Occupational Health Coordinator (474-6438) if you require assistance with this risk assessment.
		5	PI/Supervisor has discussed the need for the employee/student to inform health care providers of the nature of the laboratory research during an accident or post-exposure medical visit.
		6	PI/Supervisor has reviewed the site-specific laboratory safety requirements with the employee/student, including working alone, personal lab hygiene and responsibilities for safety, site specific waste procedures, and emergency response contacts.
		7	Hazard assessment, use and limitations information concerning Personal Protective Equipment (PPE) required in laboratory has been reviewed and personnel have been provided with the appropriate personal equipment required (lab coat(s), safety glasses/goggles, gloves) and shown location of shared PPE (e.g. face shields, temp resistant gloves)
		8	Does the employee/student need a respirator? ( ) YES ( ) NO If yes, arrange for exposure evaluation, training and fit testing through the Environmental Health and Safety Office at 474-6633.

		9	Has the pertinent procedures for emergency response been identified to the employee/student for:
			a. Spills, Ventilation/fume hood failures, etc.
			b. Fire (Fire procedures and Fire Marshall identified?)
			c. Personal injury and/or medical emergency (First aid responders identified?)
			d. Accident/Incident reporting procedure
		10	Have all Safety and Emergency Equipment <b>locations and procedures</b> been identified to the employee/student?
			a. Emergency Shower
			b. Emergency Eyewash
			c. Fire Alarm Pull Station
			d. Fire Extinguisher
			e. First aid and Spill Kits
			f. Emergency Contact Phone #s
			g. Fume Hoods
			h. Biological Safety Cabinets (BSC)
			i. Flammable Storage Cabinets
			k. Others
		11	Have the site-specific waste procedures and locations of the Hazardous Waste Wall Charts (Lab waste, Biohazardous waste, Radioactive waste) been identified and explained to the employee/student:
			a. Solvents?
			b. Acids/bases?
			c. Radioactive material?
			d. Sharps/broken glass?
			e. Biohazardous material?
			f. Animal carcasses?
		12	Has the PI/Supervisor reviewed with the employee/student, the laboratory signage system and entrance requirements as indicated on the door? Contact EHSO 474-6633 for information on installation of door signage.
		13	If radioactive materials are used in the lab, has the employee/student been made aware of the radiation safety awareness training? Contact EHSO at 474-6633 to register.
		14	If a biological material user, has the employee/student signed up for generic BSC and Biosafety training. Call 474-6633.
		15	All new lab personnel must view the "Basic Lab Safety and WHMIS" presentation and write and pass the test. WHMIS Coordinator signature below** indicates that this has been documented.
		16	<b>If radioactive material will be used by the new personnel, has the employee/student been added to the Internal Radioisotope Permit and registered for training? Call 789-3613</b>
		17	The new employee/student understands that the PI/official supervisor can/should be contacted at any time to discuss safety concerns.

**\*\*WHMIS Coordinator** \_\_\_\_\_

***The signatures below indicate that the above material has been reviewed with this employee/student and the employee/student agrees to follow the prescribed lab and departmental safety procedures:***

**Employee/Student** \_\_\_\_\_

**Principal Investigator/ Official Supervisor\*** \_\_\_\_\_

\*Official Supervisor is a person whose supervisory responsibilities are defined in their job description

### Discussion questions for PI and new Lab Personnel

1. What are the hazards for 2-3 of the most hazardous/toxic chemicals or solutions that you use?
2. What biological risk group 2 agents or potential infectious material do you work with?
3. What are the routes of transmission of any hazards associated with this biological material?
4. What are the symptoms of infection with this material?
5. Would work with this material require Hepatitis B or other immunizations? Has this been started?
6. How do you protect yourself **and your co-workers** while working with the materials listed in #1 and #2?
7. When your experiments require use of a chemical or biological material that you haven't used before, what steps do you take before using it?
8. Are your lab's working solutions, and your own, (other than saline, PBS, culture medium) labeled with completed, individual WHMIS labels?
9. You are working late in the lab and have a major spill of one of the hazardous materials you have listed in #1. What should you do?
10. Considering your project as a whole, what are the major points in your own work where a risk is encountered and how do you plan to contain these risks?
11. Do you have any comments about your current procedures that would enable you to work more safely that your department should consider?



UNIVERSITY  
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## LABORATORY SELF-INSPECTION CHECKLIST

Environmental Health and Safety Office	
Main Office	Bannatyne Office
191 Frank Kennedy Centre	T248-249 Basic Sciences Bldg
Winnipeg, MB, R3T 2N2	Winnipeg, MB, R3E 0W3
Tel: 474-6633 FAX: 474-7629	Tel: 789-3613 FAX: 789-3906

<b>Building &amp; Room</b>		
<b>Department</b>		
<b>Inspected by (Name(s) and Title(s))</b>		
<b>PI/Supervisor</b>	<b>Tel:</b>	<b>E- mail</b>
<b>List Labs/Rooms under your Supervision</b>		
<b>Date of Inspection</b>		

**Complete one checklist per principal investigator and return to the EHSO location nearest to you (Keep the original for your record). If one or more of laboratories differ from what you state for items answered below indicate that in the "Comments" section.**

<i>Note: See Appendix for relevant explanations or extra information to questions marked with an asterisk *</i>					
<b>PART A - PI/SUPERVISOR SPECIFIC</b>		Yes	No	N/A	Comments
<b>1.</b>	<b>General Policies, Responsibilities, Due Diligence and Awareness</b>				
1-1	Are working alone policy and protocols in place?				
1-2*	Is an Incident/Accident Reporting procedure in place?				
1-3	a. Does the Principal Investigator/Supervisor have Biosafety Permit Registration?				
	b. If yes, Permit #				
1-4*	Is there any immunization policy/standard operative for lab personnel?				
1-5	Has the Department/Supervisor/Principal Investigator provided documented Laboratory Biosafety training?				
1-6	Do the lab personnel know who the <b>Departmental WHMIS Coordinator</b> is?				
1.7	a. Are lab personnel (students and staff) WHMIS trained?				
	b. Is Generic WHMIS training documented for all lab personnel?				
	c. Do the lab personnel receive Refresher WHMIS/training?				
	d. If answer to 'c' is yes, how often?				
1-8	a. Are MSDS located in the lab, accessible and current?				
	b. Do all lab personnel know how to access MSDS?				
1-9	Do the lab personnel know the laboratory waste disposal protocol?				
1-10	Are lab personnel proficient in the use of Biological Safety Cabinets (BSC) and can they demonstrate knowledge of biosafety principles and equipment function?				
1-11	Is every one that works in the lab instructed on how to identify radiation hazards and what to do in the event of an emergency?				
1-12	Are the lab - personnel orientated about:				
	a. lab-specific hazards/risks?				
	b. equipment hazards and operational safety?				
	c. use and location of personal protective equipment (PPE) (Lab coats, different types of gloves, Face shield, Splash Goggles/Safety glasses, respirators)?				
1-13*	Do the lab personnel know how to use a fire extinguisher?				

	<b>PART B – LAB SPECIFIC</b>	<b>Yes</b>	<b>NO</b>	<b>N/A</b>	<b>Comments</b>
<b>2.</b>	<b>Signage, Postings, Resource materials and Security:</b>				
2-1*	Is there EHSO signage at the entrance to the lab indicating emergency contact info, controlled product volumes and hazards inside the lab?				If no sign, contact EHSO at 474-6633 to arrange for a sign template.
2-2*	Are Post Exposure Protocols posted?				
2-3	Are Emergency contact information and laboratory classification posted at every laboratory entrance door(s) for every Radioisotope permit holder?				
2-4	Are chemicals labeled in accordance with WHMIS?				
2-5	Are labels intact and legible?				
2-6	Are Laboratory Waste Disposal Charts (for Chemical, Biological and Radioactives) displayed?				
2-7	Are Health Canada Laboratory Biosafety Guidelines and U of Manitoba Biosafety Guide available in the Lab?				
2-8	Are labs locked when no one is in attendance?				
2-9	Is the most recent Internal Radioisotope Permit posted in <i>all rooms</i> listed as approved locations on the permit?				
2-10	For Basic and Intermediate Level Radioisotope Labs, is the Waste Chart for Radioisotope Laboratory posted?				
2-11	Is the updated Radiation Safety Manual available?				
2-12	Is a Radiation Safety Records Binder visible in every room listed as an approved location?				
2-13	Are Radiation Warning Symbols displayed on Radiation work areas and Radiation storage areas whenever radioactive material or radioactive contamination are present and removed when the radioactive material is removed?				
2-14	Is the Radiation Warning Symbol (magenta on yellow background) posted on the entrance door of every lab containing more than 100EQs? 100EQ of P- 32 is 7uCi. For a complete list see RSP-490, RSM-2005.				
<b>3.</b>	<b>Emergency Safety Equipment</b>				
3-1*	Is there an Eye Wash/Emergency Shower available?				
	a. If yes, is it clearly identified?				
	b. If yes, is it unobstructed?				
	c. Do you and the lab personnel know where it is located?				
3-2	Is there a First Aid Kit?				
	a. If yes, is it properly stocked?				
	<b>Fire Protection and Life Safety</b>				
3-3*	Are there an adequate number of exits?				
3-4	Are the fire exits unobstructed, clearly identified and easily visible?				
3-5*	a. Are there fire extinguishers available in the lab?				List type and size
	b. If yes, are they unobstructed?				
3-6*	a. Are compressed gas cylinders properly anchored to solid support and restrained?				
	b. Are incompatible gases segregated?				
3-7*	Are Flammables/Combustibles including waste solvents stored in accordance with Fire Code?				
3-8	Is the electrical control panel unobstructed? (3 feet in front and access to the door clear)				
3-9	Are electrical cords in good condition? (i.e. no frayed or cracked cords, insulation intact).				
3-10*	Are there adequate electrical outlets? In other words, <i>not</i> overloaded?				

3-11	Are electrical systems and cords properly grounded? ( i.e. no two-prong adapters in three-prong outlets)				
<b>4.</b>	<b>Risk assessment - General and Operational/Physical Requirements</b>				
4-1	Are equipment and machine guards in place and operable?				
4-2	a. Are 'NO FOOD OR DRINK' signs affixed on refrigerators, freezers and Microwaves used for controlled products?				
	b. Is a policy of No Food, Drink storage and consumption in the lab is enforced?				
4-3	Is the laboratory furniture (chairs etc.) made of materials that can be easily surface decontaminated?				
4-4	Are working surfaces of bench tops chemically resistant/non- absorptive?				
4-5	Are the work surfaces free of cracks, holes and defects?				
4-6	Is the floor covering seamless/continuous and coved to wall?				Specify concrete or vinyl
4-7	Are separate eating rooms available?				
4-8	a. Is there a hand washing sink in the lab?				
	b. Are hand washing soap and paper towels provided?				
4-9*	a. Are Fume hoods functional/working?				
	b. Do the fume hoods have visual tell-tale or mechanical device that indicates no or low air- flow?				
	c. Are fume hood locations appropriate?				
	d. Are there chemicals/materials/equipment stored in the fume hood blocking baffles?				
4-10	Are Laboratory Spill Kits (Chem – Acid, Base and Solvent, Bio) available, identified and in easily accessible location?				
4-11*	a. Are Chemical storage locations appropriate? (Cool, ventilated area, away from source of ignition)				
	b. Are Chemicals labeled and stored according to compatibility?				
	c. Are Chemicals not stored on the floor?				
	d. Are Liquid Chemicals stored below eye level?				
4-12*	Is flammable materials storage refrigerator/freezer available and properly labeled?				
4-13	If you have Cold Rooms /Environmental Chambers				
	a. Are they intrinsically safe?				
	b. Do these rooms have failsafe exiting?				
4-14	c. Do they have emergency alarms for oxygen deficiency?				
	Are liquid nitrogen and other <b>cryogen</b> s and solid carbon dioxide (dry ice) used?				
	a. If yes, are they stored in properly ventilated area?				
	b. Are lab personnel trained about hazards of cryogens?				
	c. Are lab personnel provided with proper PPE for handling cryogens – full face shield, over safety glasses, <u>loose fitting</u> thermal insulated or leather gloves?				
<b>5.</b>	<b>Housekeeping</b>				
5-1	Are aisles, paths of egress, and exits kept clear from obstructions-not cluttered and a minimum 3 ½ feet wide?				
5-2	Are floors free of oil, grease, liquids, broken and uneven surfaces (tripping hazards) or sharp objects?				
5-3	Is all trash placed in proper containers and disposed of properly? (e.g., sharps, empty chemical containers, broken glass, used toner, etc.)				
5-4	Are materials stored so that they are stable and do not protrude?				
5-5	Are there any materials blocking ventilation or affecting air movement?				
5-7	Are the work surfaces/bench tops clean, organized and uncluttered?				

5-8	Are sinks, hoods and refrigerators clean, uncluttered?				
5-9	Overall, is the general appearance/housekeeping of the Laboratory good, clean and orderly?				
<b>6.</b>	<b>Laboratory Safety - Chemical/ WHMIS</b>				
6-1*	Is a current Chemical Inventory maintained and available?				See "a" under Notes on page 6 in Appendix
6-2	Are all potentially unstable chemicals (e.g., ethers and other peroxidizable organic chemicals, picric acid) labeled with a date of receipt?				
6-3	Are Controlled Substances (those requiring Health Canada permit) are secured (locked)?				
6-4	Are 95% Ethanol kept secured and usage log maintained (Federal Government Requirement)?				
<b>7.</b>	<b>Laboratory Safety – Biological</b>				
7-1*	a. Are Biological Materials – bacteria, virus, fungus, parasites, human/animal blood, and toxins - used?				
	b. What is the Containment Level (CL) of the lab? <input type="checkbox"/> CL 1 <input type="checkbox"/> CL 2 <input type="checkbox"/> CL 3				
	c. Are all places where biohazards are present labeled as such?				
7-2	Are appropriate disinfectants available?				
7-3*	a. Are Autoclaves available?				
	b. Are they properly located and vented through local exhaust hoods?				
	c. Are autoclaving procedures validated and a log maintained?				
7-4	Are Biohazardous Waste Disposal Charts visibly displayed in the lab?				
7-5	a. Are Standard Operating Protocols (SOPs), Lab Safety Manual available?				
	b. Are MSDS for infectious agents available?				
7-6	Are Freezers containing biohazardous materials regularly monitored?				
7-7*	a. Are Biological Safety Cabinets (BSC) available?				
	b. Are they currently certified for use with aerosol producing procedures involving biological materials?				
	c. Is the equipment location proper?				
7-8	Are Equipment decontamination protocols/ procedures available?				
7-9	Are separate space and hooks available to hang up lab coats?				
	<b>Animal Use</b>				
7-10	Do you have animals used for research in your lab?				
7-11	Do you use any inhaled anesthetics e.g. Ether, Chloroform, Nitrous oxide, Halothane, Methoxyflurane, Enflurane, Isoflurane, Desflurane, Sevoflurane or others?				If yes, specify
<b>8.</b>	<b>Laboratory Safety - Radiation</b>				
8-1	For Intermediate Level Radioisotope labs, is entry restricted to persons listed on the permit or those in accompanied by permitted workers?				
8-2	Are radioactive chemicals manipulated on absorbent plastic backed pads?				
8-3	Are lab coats and disposable gloves worn when working with radioactive chemicals?				
8-4	Are radioactive materials spill kits available and accessible?				
8-5*	a. Are Radioactive stock vials stored in a locked box, fridge or cupboard?				
	b. Are all radioactive materials kept secure?				
8-6	Are radioactive material inventory and contamination monitoring records maintained in the Radiation Safety Records binder?				
8-7	a. Are dosimeters worn as stipulated on the Permit?				
	b. Is the lab monitored for radioactive contamination within seven days of each use of				

	radioactive chemicals and recorded in the Radiation Records binder?				
<b>9.</b>	<b>Waste Disposal</b>				
9-1	Are laboratory wastes labeled with the following information: <b>1.</b> Waste Identity (Common Chemical name of the material, no abbreviations, no formulas), <b>2.</b> Concentrations, <b>3.</b> Origin/Location, <b>4.</b> User/Generator Name and Phone No. and <b>5.</b> Precautionary Phrases?				
9-2	a. Are laboratory wastes ( chemical, biological and radioactive) properly separated (segregated) in appropriate containers (e.g., autoclaved/disinfected waste, biomedical sharps at source)?				
	b. Is there adequate supply of such containers available?				
9-3	Are laboratory chemical wastes stored according to compatibility?				
9-4	Are Radioactive waste properly labeled, stored and disposed in accordance with U. of M Radiation Safety Program requirements?				
9-5	Are containers of radioactive waste labeled with the Radiation Waste tag with all the required information?				

## Appendix “A”

### Definitions

<b>CPS</b>	The University of Manitoba <b>Controlled Products Standard</b> . This standard can be found at: <a href="http://www.umanitoba.ca/campus/health_and_safety/cps97/index.shtml">http://www.umanitoba.ca/campus/health_and_safety/cps97/index.shtml</a> . The Standard has two parts – Part A relates to Design and Part B relates to Practices which includes information about storage, compatibility of chemicals etc.
<b>Controlled Products</b>	All chemical, biological and radioactive products regulated under WHMIS and the Canadian Nuclear Safety Council (CNSC).
<b>Cryogenics</b>	Cryogenic fluids (liquefied gases) are characterized by very low temperatures below -73.3°C (-100°F). Examples are CO <sub>2</sub> , N <sub>2</sub> , He etc.
<b>PPE</b>	Stands for Personal Protective Equipment. PPE is a device or clothing used to reduce worker exposure to workplace hazards by creating a barrier between the worker and the workplace hazard when engineering and administrative controls are not feasible or ineffective in reducing these exposures to acceptable levels. Examples are : appropriate Safety Eye Wear – Safety Glasses, Safety Splash Goggles, Safety Splash Shield, Respirators, Laboratory Coats and Aprons, appropriate Gloves compatible with the hazard etc.
<b>WHMIS</b>	Workplace Hazardous Materials Information System
<b>Fire Compartment</b>	An area where the walls, doors, openings, ceiling and floor have a fire resistance rating. For laboratories, the required fire resistance rating is 1 hour.

### Information/Explanations/Links

<b>1-1 Working Alone Policy</b>	For information go to <a href="http://web2.gov.mb.ca/laws/regs/pdf/w210-105.88r.pdf">http://web2.gov.mb.ca/laws/regs/pdf/w210-105.88r.pdf</a>
<b>1-2 Incident/Accident Reporting</b>	For information go to <a href="http://www.umanitoba.ca/admin/human_resources/ehso/occ_health_comp/aiwcb.html">http://www.umanitoba.ca/admin/human_resources/ehso/occ_health_comp/aiwcb.html</a>
<b>1-4 Immunization Standard</b>	For information on U of M. Standard go to: <a href="http://umanitoba.ca/admin/human_resources/ehso/occ_health_comp/occhealthwcb.html">http://umanitoba.ca/admin/human_resources/ehso/occ_health_comp/occhealthwcb.html</a> <a href="http://umanitoba.ca/admin/human_resources/ehso/occ_health_comp/Immunization.html">http://umanitoba.ca/admin/human_resources/ehso/occ_health_comp/Immunization.html</a>
<b>2-1 Lab Signage</b>	Signage on door should indicate the hazards in the lab, the maximum quantities of controlled products in the lab, special precautions and emergency contacts and after hour telephone number. For more information go to: <a href="http://umanitoba.ca/admin/human_resources/ehso/geninfo/signage.html">http://umanitoba.ca/admin/human_resources/ehso/geninfo/signage.html</a> .
<b>2.6 Post Exposure Protocol</b>	For information on Post Exposure Protocol go to <a href="http://www.umanitoba.ca/admin/human_resources/ehso/media/BiosafetyGuideMarch05.doc">http://www.umanitoba.ca/admin/human_resources/ehso/media/BiosafetyGuideMarch05.doc</a>
<b>3-1 Emergency Shower and Eyewash</b>	Emergency shower and eyewash must be located away from sources of electricity to prevent shock and meet the most current ANSI Z358.1 standard.
<b>3-3 Exits</b>	<b>Two exits are required for labs – (a)</b> over 500 square feet in area <b>or (b)</b> having a fume hood near one exit <b>or (c)</b> having an occupancy greater than 6 <b>or (d)</b> using compressed gas cylinders or cryogenic container containing flammable gas or a gas with a Health Hazard of 3 or 4.

<b>3-5 Fire Extinguishers</b>	A fire extinguisher should be located at the entrance to the laboratory and next to equipment where the danger of fire is great. Common types of fire extinguishers are: Type A (Pressurized water for Class A fires involving ordinary combustibles such as paper, cloth, cellulose), Type BC (Carbon dioxide for B and C class fires involving flammable liquids (Class B fires) and electrical fires (Class C fires)); Type ABC (Dry Chemical for Class A, B and C fires). A minimum of 5 lb size - BC(Carbon dioxide) or ABC (Dry Chemical) type extinguisher is required.
<b>3-6 Compressed Gases</b>	The recommended maximum number of compressed gas cylinders in a <i>fire compartment</i> is two (2) or as permitted for laboratories under Manitoba Fire Code.
<b>3-7 Flammables/Combustibles</b>	Combustibles include but are not limited to cardboard boxes, Styrofoam, packaging material, etc.
<b>3-7 Flammable Storage Cabinet</b>	The maximum quantity of flammable liquids and combustible liquids permitted in a flammable storage cabinet shall be 500 L, of which not more than 250 L shall be Class I liquids.
	Consideration has to be given to the storage in the lab of quantities of dangerous goods other than flammable liquids and combustible liquids as these may not be permitted under the Manitoba Fire Code.
	Consideration must also be given to flammable liquid waste
	The maximum quantity of flammable liquids and combustible liquids permitted under the Manitoba Fire Code for an open laboratory is 300 L of which not more than 50L is Class I liquid or what is required for a normal day operation.
<b>Flammable materials</b>	<i>Only flammable liquids requiring refrigeration (usually determined by experimental requirements) may be stored in intrinsically safe refrigerators and freezers. (These are commercially sold as Explosion Proof and Flammable Materials Storage Refrigerators/Freezers).</i>
<b>3.10 Electrical</b>	Use correct size extension cords only when necessary and <b>only on temporary basis</b> . About overloading, consider the following: If the electrical circuit is 110 volts and the fuse is 15 amps (i.e., the outlet is for 15 amps), then the circuit will handle $15 \times 110 = 1650$ watts. The load should be lower than 1650 watts. If the total wattage for the equipment plugged into the circuit is over 1650 watts, then the circuit is overloaded. For more information go to: <a href="http://www.cdc.gov/niosh/docs/2002-123/2002-123a.html">http://www.cdc.gov/niosh/docs/2002-123/2002-123a.html</a> and <a href="http://www.cdc.gov/niosh/injury/traumaelec.html">http://www.cdc.gov/niosh/injury/traumaelec.html</a>
<b>4-9 Fume Hoods</b>	Must be located away from the primary laboratory exit. Fume hoods shall be located out of the normal traffic pattern and away from interfering room air currents such as those caused by doorways and general ventilation devices such as air diffusers. A minimum of 12 inch clearance on both sides of fume hoods is required for proper servicing of fume hood.
	The safe operating range of a fume hood face velocity is 80 to 120 linear feet per minute (lfpm) at 11 inch sash height. A label indicating this is affixed to the front face of the fume hood at the proper sash height. Fume hoods must not be used to store chemicals.
<b>7-1 Biological Materials</b>	Laboratories using biological materials must follow the Health Canada Laboratory Biosafety Guidelines. EHSO can provide assistance in procuring the guidelines.
<b>7-1 Biological Materials</b>	Decontamination may include: disinfection, autoclaving, and/or incineration.
<b>7-1 Containment Level (CL)</b>	These are selected to provide the laboratory worker with a description of the minimum containment required for handling the organism safely in the laboratory. ( <i>In the United States of America and in many others, the term Biosafety Level (BSL) is used.</i> )

**CL1** does not require special design features beyond those suitable for a well designed functional laboratory.

**CL2** requires primary containment devices such as BSCs and centrifuges with sealed rotors or safety cups as well as PPE (gloves, lab coats and protective eyes, hand washing sinks and autoclaves).

**CL3** requires additional primary and secondary barriers to minimize release of infectious agents into the immediate laboratory and the environment. Additional features to prevent transmission of CL3 organisms are respiratory protection, HEPA filtration of exhausted laboratory air and strictly controlled laboratory access.

**7-3 Local Exhaust Hoods**

Local exhaust hoods must be designed to efficiently exhaust fumes, aerosols or gases that are hazardous, odoriferous or explosive either at the source or near the floor level

**7-9 Biological Safety Cabinets (BSC)**

A minimum of 12 inch (30 cm) clearance on both sides and the rear of Biological Safety Cabinets is required for proper servicing of cabinet. A 12-14 inch clearance above the cabinet may be required to provide for accurate air-velocity across the exhaust filter surface. The ideal location for the BSC is remote from the entry (e.g., the rear of the laboratory away from traffic. Open windows, air supply diffusers/registers or laboratory equipment that creates air movement (centrifuges, vacuum pumps) should not be located near the BSC. Chemical fume hoods must not be located close to the BSC. A BSC must be certified when installed, moved to another location, and annually thereafter. For information on certification, visit EHSO web page and look under Biological Safety Program.

**8-5 Radioactive Products**

Radioactive products must be stored in a secured (lockable) location.

**NOTES -**

**a. Inventory Database Initiative**

EHSO has introduced a University wide Controlled Products (Chemical, Biological and Radioactive materials) web based Inventory Database called "Environmental Health and Safety Assistant" (EHSA). For general information on the database go to: [http://www.umanitoba.ca/admin/human\\_resources/ehso/ehs\\_db/index.html](http://www.umanitoba.ca/admin/human_resources/ehso/ehs_db/index.html).

The departments can maintain their Controlled Products Inventory by making use of this web based Database. For more information call Evelyn Froese at 789-3477.

**b. Lab Safety**

A safety corner in a laboratory would have the following items:

- Safety communication centre such as a dedicated bulleting board,
- MSDS for the chemicals in the lab (A WHMIS MSDS must not be older than 3 years from the date of production or revision)
- First aid kit,
- Spill kit,
- Emergency telephone or other communication device.

An emergency telephone accessible to staff / students is required on each floor and preferably in each laboratory. The emergency telephone must be accessible 24 hours a day, 7 days a week.

**c. Transportation of Controlled Products**

Carts used for transporting controlled products should be designed with sides, secondary containment and wheels that will not catch in cracks or floor gaps as at the elevator.

Compressed gas cylinders must be transported secured on a dolly/cart with chain/straps securely buckled.

## Control Measures for Class 3b and 4 Lasers Based on ANSI Z136.1-2007

### 1. The Applicability of Control Measures

- 1.1. Control measure shall be implemented by the Departmental Owner of each Laser to reduce the possibility of human exposure to hazardous laser radiation and the associated hazards (non-beam hazards).
- 1.2. When a laser or laser product is located within a workspace that is not under the sole control of the Departmental Owner of the laser, the Department Head controlling access to the space must recognize and implement controls to protect all the occupants of the work area in conjunction with the Departmental Owner.
- 1.3. Control measures shall be implemented to reduce the exposure of humans to below the applicable Maximum Permissible Exposure (MPE). *Where the MPE and NHZ have not been calculated and confirmed by a qualified and experienced Laser Safety Officer, the whole room or enclosure shall be considered the Laser Controlled Area and requires the implementation and adherence to the site specific prescribe Control Measures.*

### 2. Laser Control Measures

- 2.1. Prior to operation, it is incumbent upon the Departmental Owner of each laser to ensure the laser is located in a facility, room or enclosure with the following minimum physical and administrative features:
- 2.2. A Laser Controlled Area shall be defined to contain the laser radiation. The room or enclosure must shield the public areas to ensure that members of the public may not be inadvertently exposed to laser radiation or non-beam hazards associated with the use of the laser.

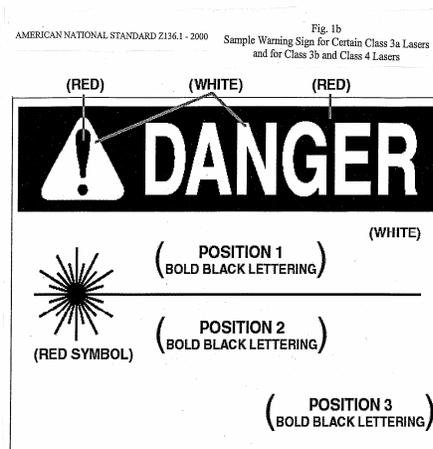
2.2.1. The Laser Controlled Area shall be posted with the appropriate warning sign (see image to the left) in accordance with ANSI Z136.1:

- a) Position 1 states, as appropriate:
  - b) Laser Protective Eyeware Required, or
  - c) Invisible Laser Radiation
  - d) Knock Before Entering
  - e) Do Not Enter When Light Is On
  - f) Restricted Area

2.2.2. Position 2 states the type of laser (Nd:Yag etc)

2.2.3. Position 3 states the class of laser in operation

2.2.4. Non-beam hazards shall be clearly communicated at the entrance as well.



- 2.3. The access to the laser key shall be restricted to the departmental owner and authorized Laser Operators. The Laser Operator shall be trained to operate the specific laser safely and shall be responsible to ensure the site specific Laser SOPs are followed while supervising everyone within the Laser Controlled Area.
- 2.4. During all operation, maintenance and servicing, access to the Laser Controlled Area shall be limited to a Laser Operator as authorized by the Departmental Owner or persons supervised by the authorized Laser Operator.

- 2.5. Laser Control Measures are documented in **Laser SOPs** that are site specific and appropriate for each type of experiment or procedure involving the laser. Laser Control Measures shall be approved by an experienced and knowledgeable Laser Safety Officer. Control of non beam hazards should be included. The safety of ancillary staff is to be considered in defining Laser SOPs. When possible engineering controls shall be implemented before administrative procedures or personal protection. SOPs are implemented for the various functions performed with the Laser:
- 2.6. OPERATION MODE: Laser classification is based on the designed output in the operation mode and Laser SOPs must be developed to mitigate the risks associated with the laser classification.
- 2.7. MAINTENANCE MODE: Maintenance would be limited to tasks associated with assuring the routine performance of the laser such as cleaning and replacing expendables and additional precautions may be required to ensure safety.
- 2.8. SERVICE MODE: Service would include the non-routine replacing or repairing faulty parts and may include access to the beam requiring additional control measures.

**3. Laser Control measures for class 3b lasers shall include:**

- 3.1.1. Activation warning system: chime, light or verbal count down, and
  - a) Lights must be visible through protective eyewear, and
  - b) Viewable within the occupied regions of the Laser Controlled Area
- 3.1.2. Operation of the Laser shall ensure the beam is well defined and limited within the controlled space.
- 3.1.3. Consideration shall be given as appropriate to:
  - a) Terminate any potentially hazardous beam in a beamstop of an appropriate material.
  - b) Locate the exposed beam above or below eye level of everyone in the room
  - c) Provide all persons within the Laser Controlled Area with appropriate eye protection
  - d) Cover all windows, doorways, open portals to reduce the transmitted radiation.

**4. Laser Control Measures for Class 4 lasers shall include:**

- 4.1.1. Room or occupied enclosure shall facilitate rapid egress in an emergency
- 4.1.2. A clearly marked "Panic Button" to deactivate the laser below MPE (should be red and mushroom shaped).
- 4.1.3. Entryway to Laser Controlled Area must have one of the following:
  - a) Non-defeatable Area/Entry Control Interlocked with Laser, or
  - b) Defeatable Entry controls may be appropriate if there is no hazardous radiation at the entry way
  - c) Procedural Entry Control if
    - 4.1.3.c.1. Everyone with access has adequate training and PPE is provided at entry
    - 4.1.3.c.2. A door, blocking barrier or screen attenuates the laser radiation at the entry point
    - 4.1.3.c.3. There is a visible or audible signal indicating the laser is activated.

**physics &  
astronomy**

university of manitoba



# **ALLEN BUILDING**

## **Fire Safety Plan**

September 2008

## **Department of Physics and Astronomy Fire Warden List**

**FIRE WARDENS – ALLEN BUILDING** (eff. Jan.08.14)

**CHIEF FIRE WARDEN:** K. S. Sharma/A. Pankewycz

<b>Name</b>	<b>Phone</b>	<b>Area of Responsibility</b>	<b>Alternate</b>
S. Beshta	9817	100 Floor	C. Friesen
G. Gwinner	9856	200 Floor Back Door	R. Hamel
W. Klassen	9817	200 Floor Armes Link	
J. van Lierop	9817	300 Floor	B. W. Southern
H. Kunkel	9214	400 Floor	Y. Gui
F. Lin	9895	500 Floor	W. Ens
A. Strybulevych	8415	600 Floor	J. S. Lee

### **Responsibility for the handicapped**

J. Fiege	9671	5 <sup>th</sup> Floor
H. Kunkel	9214	4 <sup>th</sup> Floor
K. S. Sharma	9817	3 <sup>rd</sup> Floor
M. Gericke	6203	2 <sup>nd</sup> Floor

## FIRE ORDERS FOR ALL OCCUPANTS

All occupants shall be familiar with the University's General Fire Emergency Procedures (as follows) and know locations of exits, fire alarm manual pull stations and portable fire extinguishers. Also,

**If you have a disability, arrange for a "buddy" system.**

### SHOULD YOU DISCOVER OR SUSPECT A FIRE

**R**EQUEST everybody in the area to evacuate the building. Remove anybody in immediate danger.

**A**CTIVATE the building fire alarm system by pulling the manual pull station. From a safe location, dial "**555**" (if using a university phone), "**#555**" (if using a cellular phone on MTS or Roger's Wireless), "**911**" (if using personal phone) or use emergency **red** phone.

**C**ONFINE the fire by closing all doors and windows.

**E**VACUATE or **EXTINGUISH** the fire using the appropriate fire extinguisher. Do not attempt to extinguish a fire if this will place you in immediate danger.

**REMEMBER, THE PRESERVATION OF HUMAN LIFE IS THE PRIMARY CONCERN!**

### WHEN THE FIRE ALARM SOUNDS

1. Cease all activities. Turn off heat producing devices. Leave overhead lights on.
2. Close all doors and/or windows in the immediate area.
3. Evacuate the building immediately using the nearest safe available stairwell.  
**DO NOT USE BUILDING ELEVATORS.**
4. Remain outside the building until the most senior member of the Winnipeg Fire Department or the University Fire Marshall gives "ALL CLEAR" and the fire alarm system is silenced.

If "911" is dialed, you must also inform Campus Security at 474-9341.

## **Safe Areas of Refuge**

- St. John's College
- Machray Hall via Armes link

**Safe Areas to Host Disabled Persons** (Rooms must not have a grill in the door). However, since these safe areas must be accessible 24 hours a day, the public washrooms on each floor remain an option for this purpose, in spite of the fact that the doors presently have grills in them.

- 200 Floor
  - Any faculty office
- 300 Floor
  - Room 330 or 326
  - Any faculty office
  - Women's washroom (if above are not accessible)
- 400 Floor
  - Men's washroom
- 500 Floor
  - Any faculty office
  - Women's washroom (if above are not accessible)

## **Safe Exits**

- Please refer to the maps posted on each floor, near the exit doors and/or elevators.
- Through the foyer link doors, to the Armes link and on to Machray Hall
- Through the loading dock doors, and on to St. John's College
- DO NOT exit through the tunnel unless absolutely necessary.

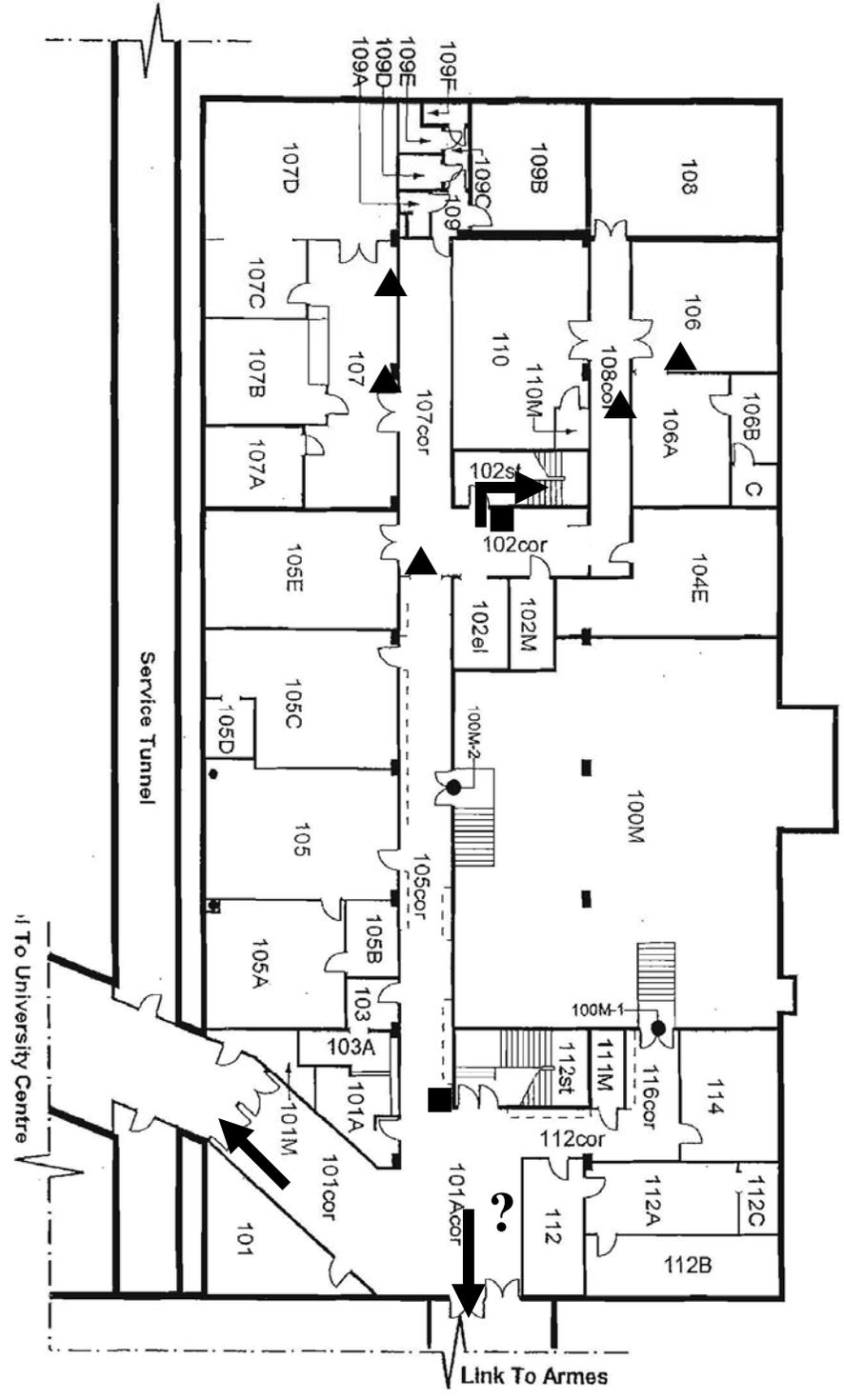
**Fire Wardens will be stationed at the following areas to restrict access to the Allen Building and to provide assistance.**

- Two wardens at the tunnel link doors (100 level)
  - To University Centre
  - To the Armes link
- One warden at the link doors (200 level)
- One warden at the loading dock doors

**Please refer to the following maps for locations of: pull stations, fire extinguishers, emergency exits, and safe areas of refuge.**



- Pull Stations
- ▲ Fire Extinguishers
- ? Emergency Phones
- ➔ Emergency Exits





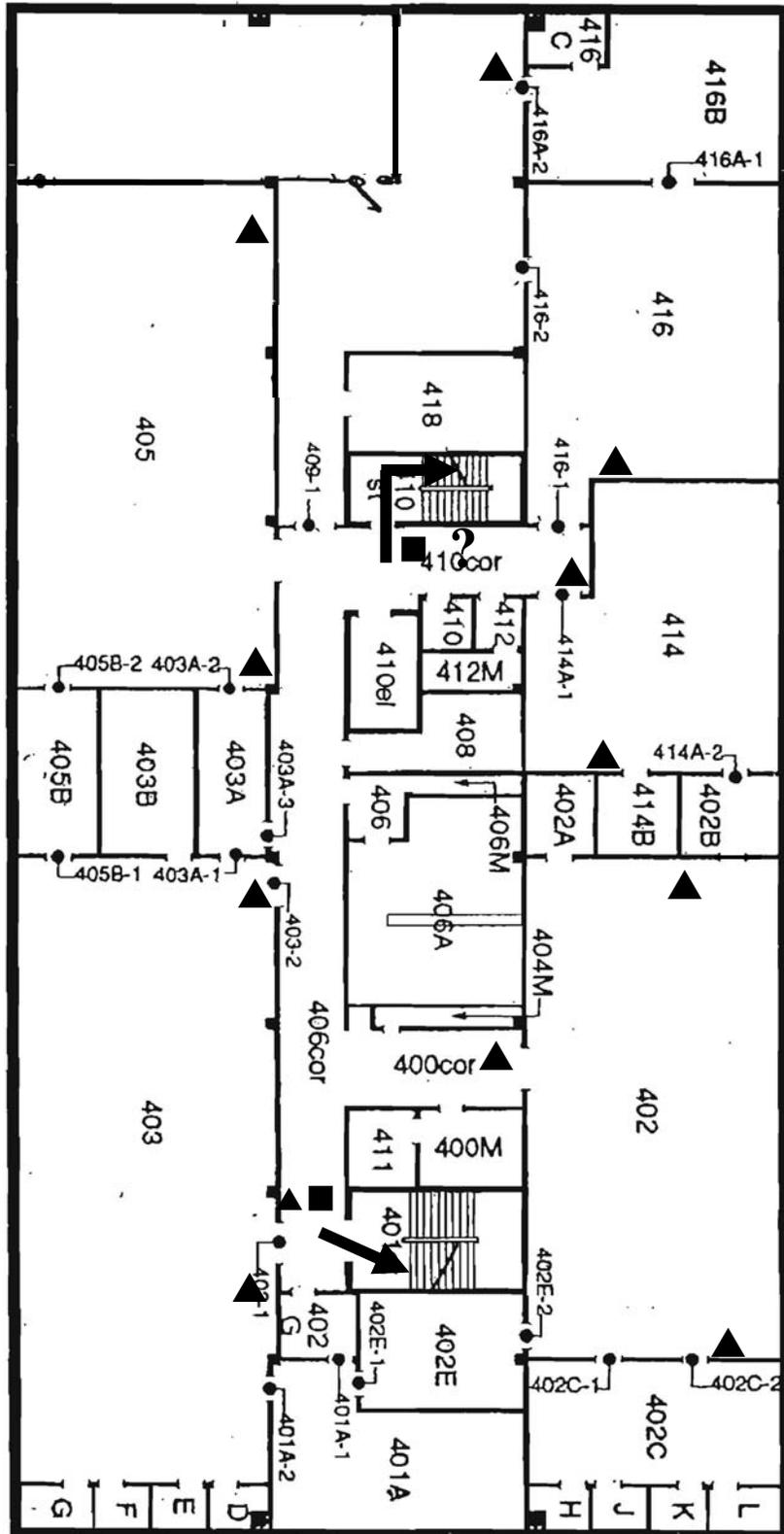


■ Pull Stations

▲ Fire Extinguishers

? Emergency Phones

➔ Emergency Exits

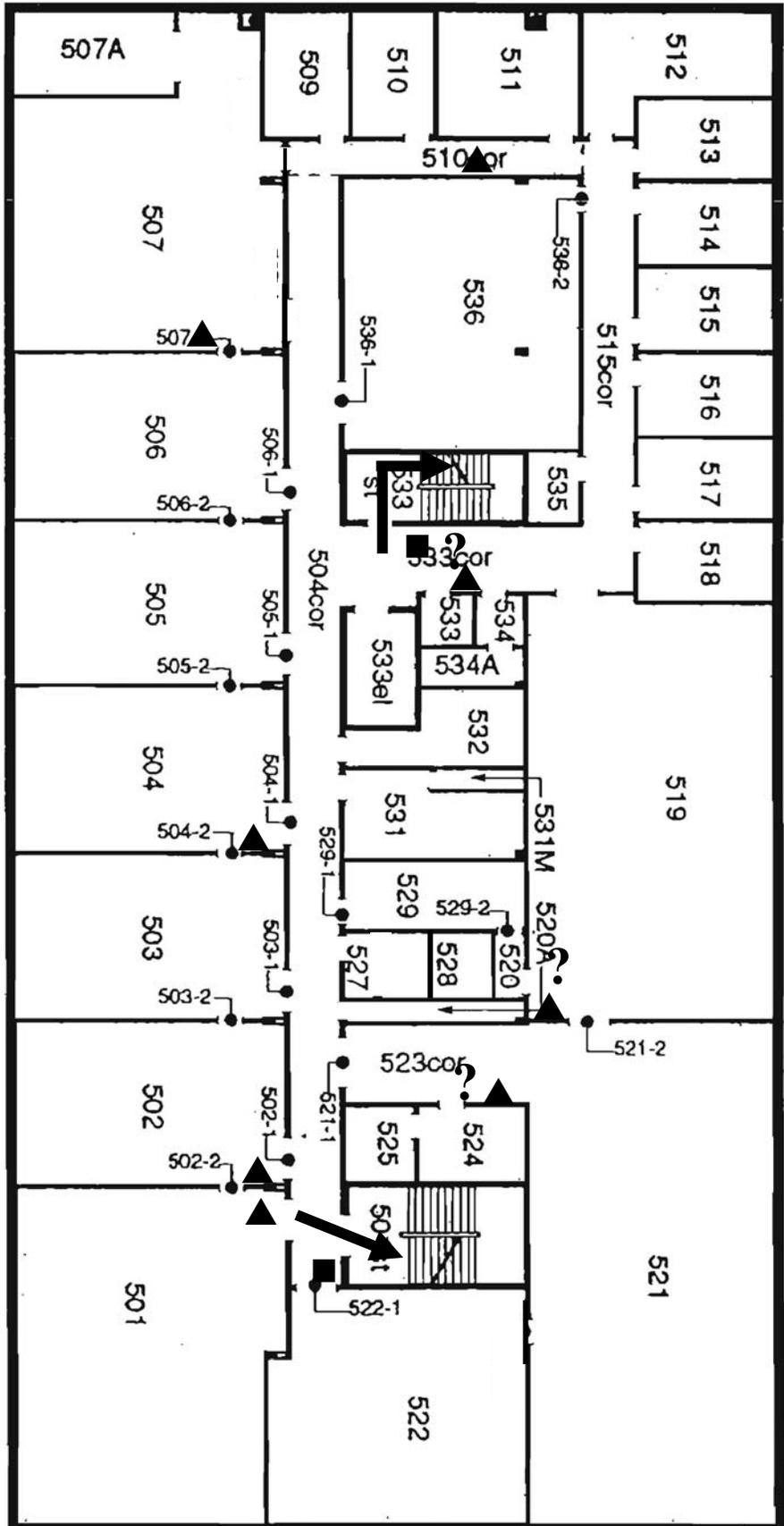


■ Pull Stations

▲ Fire Extinguishers

? Emergency Phones

➔ Emergency Exits

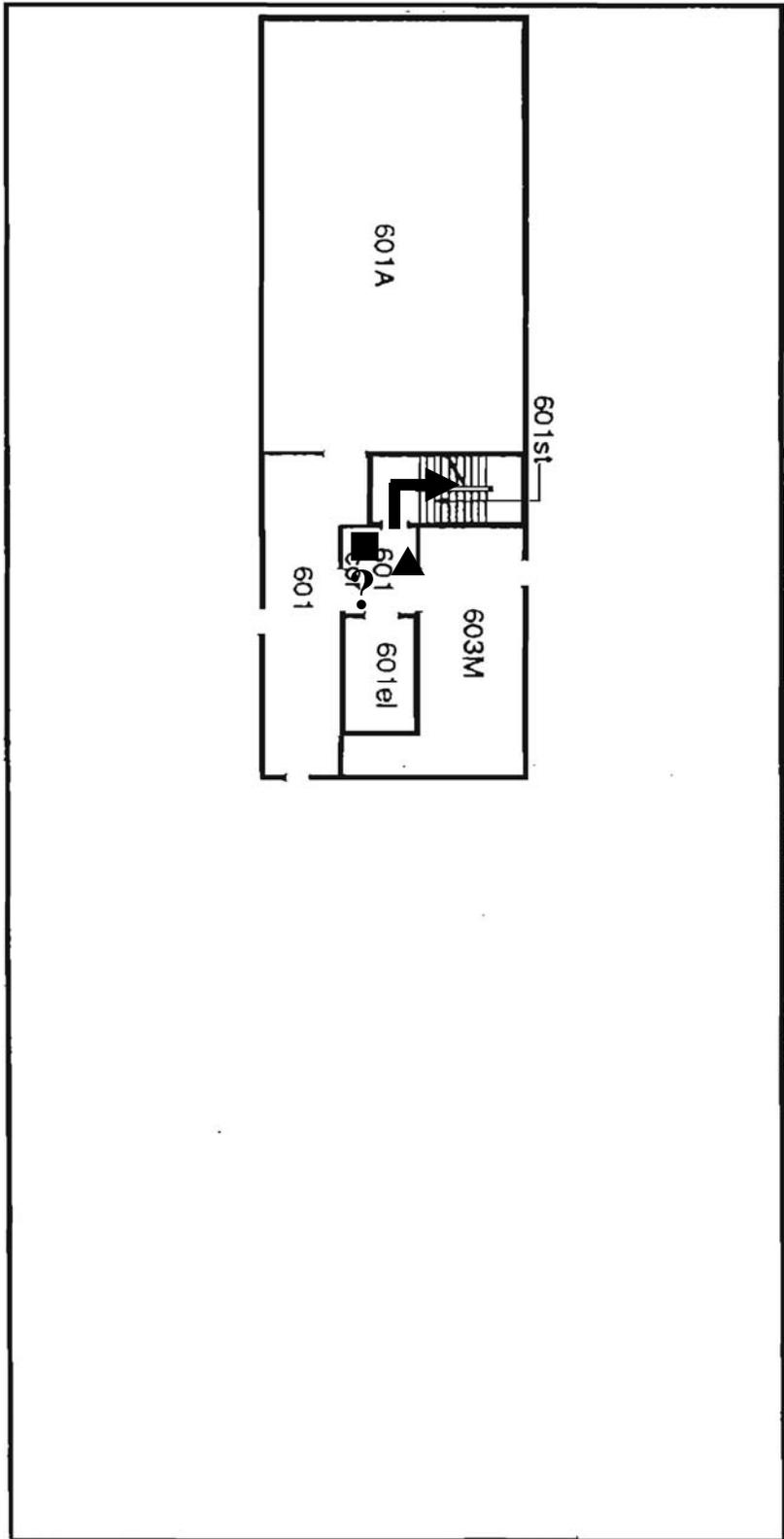


■ Pull Stations

▲ Fire Extinguishers

? Emergency Phones

➡ Emergency Exits



When in doubt, the following **GENERAL FIRE EMERGENCY PROCEDURES** should apply:

### **SHOULD YOU DISCOVER OR SUSPECT A FIRE**

- R** equest everybody in the area evacuate the building. Remove anybody in immediate danger.
- A** ctivate the building fire alarm system by pulling the manual pull station. From a safe location, inform security; dialing “555” (if using a university phone), “#555” (if using a cell phone), or press **red** button on university pay phone or inform Winnipeg Fire Department, dialing “911” (if using a personal phone).
- C** onfine the fire by closing all doors and windows.
- E** xtinguish the fire using the appropriate fire extinguisher. Do not attempt to extinguish a fire if this will place you in immediate danger or you are unsure.

**REMEMBER, THE PRESERVATION OF HUMAN LIFE IS THE PRIMARY CONCERN!**

### **WHEN THE FIRE ALARM SOUNDS**

1. Cease all activities. Turn off heat producing devices. Leave overhead lights on.
2. Close all doors and/or windows in the immediate area.
3. Evacuate the building immediately using the nearest safe available stairwell or exit (evacuating to the loading dock/back door or the Armes link).

#### **DO NOT USE BUILDING ELEVATORS**

4. Remain outside the building until the most senior member of the Winnipeg Fire Department or the University Fire Marshall gives “ALL CLEAR” and the fire alarm system is silenced.

## I. FIRE ORDERS FOR ALL OCCUPANTS

All occupants shall be familiar with the University's General Fire Emergency Procedures and know the locations of exits, fire alarm pull stations and portable fire extinguishers. Also,

**If you have a disability, arrange for a "buddy" system.**

1. If you discover or suspect a fire, or notice the presence of smoke that cannot be identified, follow the University's General Fire Emergency Procedures.
2. When evacuating the building, make sure you close doors behind you.
3. When the fire alarm sounds:
  - 3.1 Remain calm.
  - 3.2 Turn off all heat producing devices. Leave overhead lights on.
  - 3.3 If you are in an office,
    - 3.3.1 Before opening door, feel doorknob for heat. If hot, **DO NOT** open door. If it is not hot, brace yourself against door and open slightly. If you feel air pressure or hot draft, close door quickly.
    - 3.3.2 If you are confined to your suite or office, inform security; dialing "555" (if using university phone i.e. 474 or 789 exchange), "#555" (if using a cell phone) or the Winnipeg Fire Department; dialing "911" (if using personal phone) and report your location.
  - 3.4 If you encounter smoke in corridor or stairwell, stay low and move to the other side of the building where another stairwell may be clear, or return to your office.
  - 3.5 When evacuating the building, make sure you take your room key and close doors behind you.
4. Remember, **DO NOT USE ELEVATORS.**

## II. USE OF PORTABLE FIRE EXTINGUISHERS

In extinguishing small fires, portable fire extinguishers are selected as follows:

<b>TYPE OF FIRE</b>	<b>EXAMPLES</b>	<b>USE</b>
Class "A" fires	Wood, paper, bedding, etc.	Water or ABC Dry Chemical
Class "B" fires	Liquids, grease, oil, etc.	ABC or BC Dry Chemical
Class "C" fires	Energized electrical equipment	ABC or BC Dry Chemical or CO <sub>2</sub>
Class "D" fires	Metals (eg. Sodium, magnesium)	Dry Powder only

To use a portable fire extinguisher:

1. Select the proper extinguisher
2. Remove the extinguisher from its bracket/cabinet, and take it to the location of the fire. **NEVER TAKE THE FIRE TO THE EXTINGUISHER.**
3. Twist the safety pin to break the plastic seal.
4. **PULL** the safety pin out.
5. **AIM** the extinguisher nozzle at the BASE of the fire.
6. **SQUEEZE** the extinguisher handle.
7. **SWEEP** the extinguisher rapidly, starting at the base of the flame and moving across the fire.

If the fire does not immediately extinguish, isolate the area and evacuate the building. **NEVER** return a used extinguisher to its bracket/cabinet. Advise Security (474-9312) or the Fire Marshall (474-9083) when an extinguisher requires servicing.

### **III. THE CONTROL OF FIRE HAZARDS**

In order to avoid fire hazards in the building, occupants are advised **NOT** to:

- Smoke in the building.
- Use real fir trees/branches for indoor decorations. Christmas lights shall be CSA approved and limited to” three strings of 25 regular lights, or not more than 300 miniature lights in a string or as recommended by the manufacturer, whichever is less.
- Use flame-producing devices (eg. Birthday candles, sparklers) except in approved locations.
- Allow the accumulation of combustibles (garbage).
- Dispose of hot or burning materials into garbage bags or containers.
- Dispose flammable liquids or aerosol cans in garbage containers.
- Use unsafe electrical appliances, frayed electrical cords.
- Use extension cords as permanent wiring.
- Overload electrical outlets.
- Wedge doors open in a fire separation (i.e. wedge a door with an auto-closure feature open).

In laboratories, staff and students are required to:

- Handle and store all chemicals, which are Controlled Products, in accordance with the University’s policy for Controlled Products Standard. For information, contact Environmental Health and Safety Department (474-6633).
- Know and understand WHMIS (The Workplace Hazardous Information System).
- Store flammable liquids in approved containers and in quantities required for a normal day operation.
- Store all flammable liquids in excess of the quantities required for a normal day operation in flammable storage cabinets or in a flammable liquid storage room.

- 2.5. Laser Control Measures are documented in **Laser SOPs** that are site specific and appropriate for each type of experiment or procedure involving the laser. Laser Control Measures shall be approved by an experienced and knowledgeable Laser Safety Officer. Control of non beam hazards should be included. The safety of ancillary staff is to be considered in defining Laser SOPs. When possible engineering controls shall be implemented before administrative procedures or personal protection. SOPs are implemented for the various functions performed with the Laser:
- 2.6. OPERATION MODE: Laser classification is based on the designed output in the operation mode and Laser SOPs must be developed to mitigate the risks associated with the laser classification.
- 2.7. MAINTENANCE MODE: Maintenance would be limited to tasks associated with assuring the routine performance of the laser such as cleaning and replacing expendables and additional precautions may be required to ensure safety.
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**3. Laser Control measures for class 3b lasers shall include:**

- 3.1.1. Activation warning system: chime, light or verbal count down, and
  - a) Lights must be visible through protective eyewear, and
  - b) Viewable within the occupied regions of the Laser Controlled Area
- 3.1.2. Operation of the Laser shall ensure the beam is well defined and limited within the controlled space.
- 3.1.3. Consideration shall be given as appropriate to:
  - a) Terminate any potentially hazardous beam in a beamstop of an appropriate material.
  - b) Locate the exposed beam above or below eye level of everyone in the room
  - c) Provide all persons within the Laser Controlled Area with appropriate eye protection
  - d) Cover all windows, doorways, open portals to reduce the transmitted radiation.

**4. Laser Control Measures for Class 4 lasers shall include:**

- 4.1.1. Room or occupied enclosure shall facilitate rapid egress in an emergency
- 4.1.2. A clearly marked "Panic Button" to deactivate the laser below MPE (should be red and mushroom shaped).
- 4.1.3. Entryway to Laser Controlled Area must have one of the following:
  - a) Non-defeatable Area/Entry Control Interlocked with Laser, or
  - b) Defeatable Entry controls may be appropriate if there is no hazardous radiation at the entry way
  - c) Procedural Entry Control if
    - 4.1.3.c.1. Everyone with access has adequate training and PPE is provided at entry
    - 4.1.3.c.2. A door, blocking barrier or screen attenuates the laser radiation at the entry point
    - 4.1.3.c.3. There is a visible or audible signal indicating the laser is activated.

	<b>PART B – LAB SPECIFIC</b>	<b>Yes</b>	<b>NO</b>	<b>N/A</b>	<b>Comments</b>
<b>2.</b>	<b>Signage, Postings, Resource materials and Security:</b>				
2-1*	Is there EHSO signage at the entrance to the lab indicating emergency contact info, controlled product volumes and hazards inside the lab?				If no sign, contact EHSO at 474-6633 to arrange for a sign template.
2-2*	Are Post Exposure Protocols posted?				
2-3	Are Emergency contact information and laboratory classification posted at every laboratory entrance door(s) for every Radioisotope permit holder?				
2-4	Are chemicals labeled in accordance with WHMIS?				
2-5	Are labels intact and legible?				
2-6	Are Laboratory Waste Disposal Charts (for Chemical, Biological and Radioactives) displayed?				
2-7	Are Health Canada Laboratory Biosafety Guidelines and U of Manitoba Biosafety Guide available in the Lab?				
2-8	Are labs locked when no one is in attendance?				
2-9	Is the most recent Internal Radioisotope Permit posted in <i>all rooms</i> listed as approved locations on the permit?				
2-10	For Basic and Intermediate Level Radioisotope Labs, is the Waste Chart for Radioisotope Laboratory posted?				
2-11	Is the updated Radiation Safety Manual available?				
2-12	Is a Radiation Safety Records Binder visible in every room listed as an approved location?				
2-13	Are Radiation Warning Symbols displayed on Radiation work areas and Radiation storage areas whenever radioactive material or radioactive contamination are present and removed when the radioactive material is removed?				
2-14	Is the Radiation Warning Symbol (magenta on yellow background) posted on the entrance door of every lab containing more than 100EQs? 100EQ of P- 32 is 7uCi. For a complete list see RSP-490, RSM-2005.				
<b>3.</b>	<b>Emergency Safety Equipment</b>				
3-1*	Is there an Eye Wash/Emergency Shower available?				
	a. If yes, is it clearly identified?				
	b. If yes, is it unobstructed?				
	c. Do you and the lab personnel know where it is located?				
3-2	Is there a First Aid Kit?				
	a. If yes, is it properly stocked?				
	<b>Fire Protection and Life Safety</b>				
3-3*	Are there an adequate number of exits?				
3-4	Are the fire exits unobstructed, clearly identified and easily visible?				
3-5*	a. Are there fire extinguishers available in the lab?				List type and size
	b. If yes, are they unobstructed?				
3-6*	a. Are compressed gas cylinders properly anchored to solid support and restrained?				
	b. Are incompatible gases segregated?				
3-7*	Are Flammables/Combustibles including waste solvents stored in accordance with Fire Code?				
3-8	Is the electrical control panel unobstructed? (3 feet in front and access to the door clear)				
3-9	Are electrical cords in good condition? (i.e. no frayed or cracked cords, insulation intact).				
3-10*	Are there adequate electrical outlets? In other words, <i>not</i> overloaded?				

3-11	Are electrical systems and cords properly grounded? ( i.e. no two-prong adapters in three-prong outlets)				
<b>4.</b>	<b>Risk assessment - General and Operational/Physical Requirements</b>				
4-1	Are equipment and machine guards in place and operable?				
4-2	a. Are 'NO FOOD OR DRINK' signs affixed on refrigerators, freezers and Microwaves used for controlled products?				
	b. Is a policy of No Food, Drink storage and consumption in the lab is enforced?				
4-3	Is the laboratory furniture (chairs etc.) made of materials that can be easily surface decontaminated?				
4-4	Are working surfaces of bench tops chemically resistant/non- absorptive?				
4-5	Are the work surfaces free of cracks, holes and defects?				
4-6	Is the floor covering seamless/continuous and coved to wall?				Specify concrete or vinyl
4-7	Are separate eating rooms available?				
4-8	a. Is there a hand washing sink in the lab?				
	b. Are hand washing soap and paper towels provided?				
4-9*	a. Are Fume hoods functional/working?				
	b. Do the fume hoods have visual tell-tale or mechanical device that indicates no or low air- flow?				
	c. Are fume hood locations appropriate?				
	d. Are there chemicals/materials/equipment stored in the fume hood blocking baffles?				
4-10	Are Laboratory Spill Kits (Chem – Acid, Base and Solvent, Bio) available, identified and in easily accessible location?				
4-11*	a. Are Chemical storage locations appropriate? (Cool, ventilated area, away from source of ignition)				
	b. Are Chemicals labeled and stored according to compatibility?				
	c. Are Chemicals not stored on the floor?				
	d. Are Liquid Chemicals stored below eye level?				
4-12*	Is flammable materials storage refrigerator/freezer available and properly labeled?				
4-13	If you have Cold Rooms /Environmental Chambers				
	a. Are they intrinsically safe?				
	b. Do these rooms have failsafe exiting?				
4-14	c. Do they have emergency alarms for oxygen deficiency?				
	Are liquid nitrogen and other <b>cryogen</b> s and solid carbon dioxide (dry ice) used?				
	a. If yes, are they stored in properly ventilated area?				
	b. Are lab personnel trained about hazards of cryogens?				
	c. Are lab personnel provided with proper PPE for handling cryogens – full face shield, over safety glasses, <u>loose fitting</u> thermal insulated or leather gloves?				
<b>5.</b>	<b>Housekeeping</b>				
5-1	Are aisles, paths of egress, and exits kept clear from obstructions-not cluttered and a minimum 3 ½ feet wide?				
5-2	Are floors free of oil, grease, liquids, broken and uneven surfaces (tripping hazards) or sharp objects?				
5-3	Is all trash placed in proper containers and disposed of properly? (e.g., sharps, empty chemical containers, broken glass, used toner, etc.)				
5-4	Are materials stored so that they are stable and do not protrude?				
5-5	Are there any materials blocking ventilation or affecting air movement?				
5-7	Are the work surfaces/bench tops clean, organized and uncluttered?				

5-8	Are sinks, hoods and refrigerators clean, uncluttered?				
5-9	Overall, is the general appearance/housekeeping of the Laboratory good, clean and orderly?				
<b>6.</b>	<b>Laboratory Safety - Chemical/ WHMIS</b>				
6-1*	Is a current Chemical Inventory maintained and available?				See "a" under Notes on page 6 in Appendix
6-2	Are all potentially unstable chemicals (e.g., ethers and other peroxidizable organic chemicals, picric acid) labeled with a date of receipt?				
6-3	Are Controlled Substances (those requiring Health Canada permit) are secured (locked)?				
6-4	Are 95% Ethanol kept secured and usage log maintained (Federal Government Requirement)?				
<b>7.</b>	<b>Laboratory Safety – Biological</b>				
7-1*	a. Are Biological Materials – bacteria, virus, fungus, parasites, human/animal blood, and toxins - used?				
	b. What is the Containment Level (CL) of the lab? <input type="checkbox"/> CL 1 <input type="checkbox"/> CL 2 <input type="checkbox"/> CL 3				
	c. Are all places where biohazards are present labeled as such?				
7-2	Are appropriate disinfectants available?				
7-3*	a. Are Autoclaves available?				
	b. Are they properly located and vented through local exhaust hoods?				
	c. Are autoclaving procedures validated and a log maintained?				
7-4	Are Biohazardous Waste Disposal Charts visibly displayed in the lab?				
7-5	a. Are Standard Operating Protocols (SOPs), Lab Safety Manual available?				
	b. Are MSDS for infectious agents available?				
7-6	Are Freezers containing biohazardous materials regularly monitored?				
7-7*	a. Are Biological Safety Cabinets (BSC) available?				
	b. Are they currently certified for use with aerosol producing procedures involving biological materials?				
	c. Is the equipment location proper?				
7-8	Are Equipment decontamination protocols/ procedures available?				
7-9	Are separate space and hooks available to hang up lab coats?				
	<b>Animal Use</b>				
7-10	Do you have animals used for research in your lab?				
7-11	Do you use any inhaled anesthetics e.g. Ether, Chloroform, Nitrous oxide, Halothane, Methoxyflurane, Enflurane, Isoflurane, Desflurane, Sevoflurane or others?				If yes, specify
<b>8.</b>	<b>Laboratory Safety - Radiation</b>				
8-1	For Intermediate Level Radioisotope labs, is entry restricted to persons listed on the permit or those in accompanied by permitted workers?				
8-2	Are radioactive chemicals manipulated on absorbent plastic backed pads?				
8-3	Are lab coats and disposable gloves worn when working with radioactive chemicals?				
8-4	Are radioactive materials spill kits available and accessible?				
8-5*	a. Are Radioactive stock vials stored in a locked box, fridge or cupboard?				
	b. Are all radioactive materials kept secure?				
8-6	Are radioactive material inventory and contamination monitoring records maintained in the Radiation Safety Records binder?				
8-7	a. Are dosimeters worn as stipulated on the Permit?				
	b. Is the lab monitored for radioactive contamination within seven days of each use of				

	radioactive chemicals and recorded in the Radiation Records binder?				
<b>9.</b>	<b>Waste Disposal</b>				
9-1	Are laboratory wastes labeled with the following information: <b>1.</b> Waste Identity (Common Chemical name of the material, no abbreviations, no formulas), <b>2.</b> Concentrations, <b>3.</b> Origin/Location, <b>4.</b> User/Generator Name and Phone No. and <b>5.</b> Precautionary Phrases?				
9-2	a. Are laboratory wastes ( chemical, biological and radioactive) properly separated (segregated) in appropriate containers (e.g., autoclaved/disinfected waste, biomedical sharps at source)?				
	b. Is there adequate supply of such containers available?				
9-3	Are laboratory chemical wastes stored according to compatibility?				
9-4	Are Radioactive waste properly labeled, stored and disposed in accordance with U. of M Radiation Safety Program requirements?				
9-5	Are containers of radioactive waste labeled with the Radiation Waste tag with all the required information?				

## Appendix “A”

### Definitions

<b>CPS</b>	The University of Manitoba <b>Controlled Products Standard</b> . This standard can be found at: <a href="http://www.umanitoba.ca/campus/health_and_safety/cps97/index.shtml">http://www.umanitoba.ca/campus/health_and_safety/cps97/index.shtml</a> . The Standard has two parts – Part A relates to Design and Part B relates to Practices which includes information about storage, compatibility of chemicals etc.
<b>Controlled Products</b>	All chemical, biological and radioactive products regulated under WHMIS and the Canadian Nuclear Safety Council (CNSC).
<b>Cryogenics</b>	Cryogenic fluids (liquefied gases) are characterized by very low temperatures below -73.3°C (-100°F). Examples are CO <sub>2</sub> , N <sub>2</sub> , He etc.
<b>PPE</b>	Stands for Personal Protective Equipment. PPE is a device or clothing used to reduce worker exposure to workplace hazards by creating a barrier between the worker and the workplace hazard when engineering and administrative controls are not feasible or ineffective in reducing these exposures to acceptable levels. Examples are : appropriate Safety Eye Wear – Safety Glasses, Safety Splash Goggles, Safety Splash Shield, Respirators, Laboratory Coats and Aprons, appropriate Gloves compatible with the hazard etc.
<b>WHMIS</b>	Workplace Hazardous Materials Information System
<b>Fire Compartment</b>	An area where the walls, doors, openings, ceiling and floor have a fire resistance rating. For laboratories, the required fire resistance rating is 1 hour.

### Information/Explanations/Links

<b>1-1 Working Alone Policy</b>	For information go to <a href="http://web2.gov.mb.ca/laws/regs/pdf/w210-105.88r.pdf">http://web2.gov.mb.ca/laws/regs/pdf/w210-105.88r.pdf</a>
<b>1-2 Incident/Accident Reporting</b>	For information go to <a href="http://www.umanitoba.ca/admin/human_resources/ehso/occ_health_comp/aiwcb.html">http://www.umanitoba.ca/admin/human_resources/ehso/occ_health_comp/aiwcb.html</a>
<b>1-4 Immunization Standard</b>	For information on U of M. Standard go to: <a href="http://umanitoba.ca/admin/human_resources/ehso/occ_health_comp/occhealthwcb.html">http://umanitoba.ca/admin/human_resources/ehso/occ_health_comp/occhealthwcb.html</a> <a href="http://umanitoba.ca/admin/human_resources/ehso/occ_health_comp/immunization.html">http://umanitoba.ca/admin/human_resources/ehso/occ_health_comp/immunization.html</a>
<b>2-1 Lab Signage</b>	Signage on door should indicate the hazards in the lab, the maximum quantities of controlled products in the lab, special precautions and emergency contacts and after hour telephone number. For more information go to: <a href="http://umanitoba.ca/admin/human_resources/ehso/geninfo/signage.html">http://umanitoba.ca/admin/human_resources/ehso/geninfo/signage.html</a> .
<b>2.6 Post Exposure Protocol</b>	For information on Post Exposure Protocol go to <a href="http://www.umanitoba.ca/admin/human_resources/ehso/media/BiosafetyGuideMarch05.doc">http://www.umanitoba.ca/admin/human_resources/ehso/media/BiosafetyGuideMarch05.doc</a>
<b>3-1 Emergency Shower and Eyewash</b>	Emergency shower and eyewash must be located away from sources of electricity to prevent shock and meet the most current ANSI Z358.1 standard.
<b>3-3 Exits</b>	<b>Two exits are required for labs – (a)</b> over 500 square feet in area <b>or (b)</b> having a fume hood near one exit <b>or (c)</b> having an occupancy greater than 6 <b>or (d)</b> using compressed gas cylinders or cryogenic container containing flammable gas or a gas with a Health Hazard of 3 or 4.

<b>3-5 Fire Extinguishers</b>	A fire extinguisher should be located at the entrance to the laboratory and next to equipment where the danger of fire is great. Common types of fire extinguishers are: Type A (Pressurized water for Class A fires involving ordinary combustibles such as paper, cloth , cellulose), Type BC (Carbon dioxide for B and C class fires involving flammable liquids (Class B fires) and electrical fires (Class C fires)); Type ABC (Dry Chemical for Class A, B and C fires). A minimum of 5 lb size - BC(Carbon dioxide) or ABC (Dry Chemical) type extinguisher is required.
<b>3-6 Compressed Gases</b>	The recommended maximum number of compressed gas cylinders in a <i>fire compartment</i> is two (2) or as permitted for laboratories under Manitoba Fire Code.
<b>3-7 Flammables/Combustibles</b>	Combustibles include but are not limited to cardboard boxes, Styrofoam, packaging material, etc.
<b>3-7 Flammable Storage Cabinet</b>	The maximum quantity of flammable liquids and combustible liquids permitted in a flammable storage cabinet shall be 500 L, of which not more than 250 L shall be Class I liquids.
	Consideration has to be given to the storage in the lab of quantities of dangerous goods other than flammable liquids and combustible liquids as these may not be permitted under the Manitoba Fire Code.
	Consideration must also be given to flammable liquid waste
	The maximum quantity of flammable liquids and combustible liquids permitted under the Manitoba Fire Code for an open laboratory is 300 L of which not more than 50L is Class I liquid or what is required for a normal day operation.
<b>Flammable materials</b>	<i>Only flammable liquids requiring refrigeration (usually determined by experimental requirements) may be stored in intrinsically safe refrigerators and freezers. (These are commercially sold as Explosion Proof and Flammable Materials Storage Refrigerators/Freezers).</i>
<b>3.10 Electrical</b>	Use correct size extension cords only when necessary and <b>only on temporary basis</b> . About overloading, consider the following: If the electrical circuit is 110 volts and the fuse is 15 amps (i.e., the outlet is for 15 amps), then the circuit will handle $15 \times 110 = 1650$ watts. The load should be lower than 1650 watts. If the total wattage for the equipment plugged into the circuit is over 1650 watts, then the circuit is overloaded. For more information go to: <a href="http://www.cdc.gov/niosh/docs/2002-123/2002-123a.html">http://www.cdc.gov/niosh/docs/2002-123/2002-123a.html</a> and <a href="http://www.cdc.gov/niosh/injury/traumaelec.html">http://www.cdc.gov/niosh/injury/traumaelec.html</a>
<b>4-9 Fume Hoods</b>	Must be located away from the primary laboratory exit. Fume hoods shall be located out of the normal traffic pattern and away from interfering room air currents such as those caused by doorways and general ventilation devices such as air diffusers. A minimum of 12 inch clearance on both sides of fume hoods is required for proper servicing of fume hood.
	The safe operating range of a fume hood face velocity is 80 to 120 linear feet per minute (lfpm) at 11 inch sash height. A label indicating this is affixed to the front face of the fume hood at the proper sash height. Fume hoods must not be used to store chemicals.
<b>7-1 Biological Materials</b>	Laboratories using biological materials must follow the Health Canada Laboratory Biosafety Guidelines. EHSO can provide assistance in procuring the guidelines.
<b>7-1 Biological Materials</b>	Decontamination may include: disinfection, autoclaving, and/or incineration.
<b>7-1 Containment Level (CL)</b>	These are selected to provide the laboratory worker with a description of the minimum containment required for handling the organism safely in the laboratory. ( <i>In the United States of America and in many others, the term Biosafety Level (BSL) is used.</i> )

**CL1** does not require special design features beyond those suitable for a well designed functional laboratory.

**CL2** requires primary containment devices such as BSCs and centrifuges with sealed rotors or safety cups as well as PPE (gloves, lab coats and protective eyes, hand washing sinks and autoclaves).

**CL3** requires additional primary and secondary barriers to minimize release of infectious agents into the immediate laboratory and the environment. Additional features to prevent transmission of CL3 organisms are respiratory protection, HEPA filtration of exhausted laboratory air and strictly controlled laboratory access.

**7-3 Local Exhaust Hoods**

Local exhaust hoods must be designed to efficiently exhaust fumes, aerosols or gases that are hazardous, odoriferous or explosive either at the source or near the floor level

**7-9 Biological Safety Cabinets (BSC)**

A minimum of 12 inch (30 cm) clearance on both sides and the rear of Biological Safety Cabinets is required for proper servicing of cabinet. A 12-14 inch clearance above the cabinet may be required to provide for accurate air-velocity across the exhaust filter surface. The ideal location for the BSC is remote from the entry (e.g., the rear of the laboratory away from traffic. Open windows, air supply diffusers/registers or laboratory equipment that creates air movement (centrifuges, vacuum pumps) should not be located near the BSC. Chemical fume hoods must not be located close to the BSC. A BSC must be certified when installed, moved to another location, and annually thereafter. For information on certification, visit EHSO web page and look under Biological Safety Program.

**8-5 Radioactive Products**

Radioactive products must be stored in a secured (lockable) location.

**NOTES -**

**a. Inventory Database Initiative**

EHSO has introduced a University wide Controlled Products (Chemical, Biological and Radioactive materials) web based Inventory Database called "Environmental Health and Safety Assistant" (EHSA). For general information on the database go to: [http://www.umanitoba.ca/admin/human\\_resources/ehso/ehs\\_db/index.html](http://www.umanitoba.ca/admin/human_resources/ehso/ehs_db/index.html).

The departments can maintain their Controlled Products Inventory by making use of this web based Database. For more information call Evelyn Froese at 789-3477.

**b. Lab Safety**

A safety corner in a laboratory would have the following items:

- Safety communication centre such as a dedicated bulleting board,
- MSDS for the chemicals in the lab (A WHMIS MSDS must not be older than 3 years from the date of production or revision)
- First aid kit,
- Spill kit,
- Emergency telephone or other communication device.

An emergency telephone accessible to staff / students is required on each floor and preferably in each laboratory. The emergency telephone must be accessible 24 hours a day, 7 days a week.

**c. Transportation of Controlled Products**

Carts used for transporting controlled products should be designed with sides, secondary containment and wheels that will not catch in cracks or floor gaps as at the elevator.

Compressed gas cylinders must be transported secured on a dolly/cart with chain/straps securely buckled.

		9	Has the pertinent procedures for emergency response been identified to the employee/student for:
			a. Spills, Ventilation/fume hood failures, etc.
			b. Fire (Fire procedures and Fire Marshall identified?)
			c. Personal injury and/or medical emergency (First aid responders identified?)
			d. Accident/Incident reporting procedure
		10	Have all Safety and Emergency Equipment <b>locations and procedures</b> been identified to the employee/student?
			a. Emergency Shower
			b. Emergency Eyewash
			c. Fire Alarm Pull Station
			d. Fire Extinguisher
			e. First aid and Spill Kits
			f. Emergency Contact Phone #s
			g. Fume Hoods
			h. Biological Safety Cabinets (BSC)
			i. Flammable Storage Cabinets
			k. Others
		11	Have the site-specific waste procedures and locations of the Hazardous Waste Wall Charts (Lab waste, Biohazardous waste, Radioactive waste) been identified and explained to the employee/student:
			a. Solvents?
			b. Acids/bases?
			c. Radioactive material?
			d. Sharps/broken glass?
			e. Biohazardous material?
			f. Animal carcasses?
		12	Has the PI/Supervisor reviewed with the employee/student, the laboratory signage system and entrance requirements as indicated on the door? Contact EHSO 474-6633 for information on installation of door signage.
		13	If radioactive materials are used in the lab, has the employee/student been made aware of the radiation safety awareness training? Contact EHSO at 474-6633 to register.
		14	If a biological material user, has the employee/student signed up for generic BSC and Biosafety training. Call 474-6633.
		15	All new lab personnel must view the "Basic Lab Safety and WHMIS" presentation and write and pass the test. WHMIS Coordinator signature below** indicates that this has been documented.
		16	<b>If radioactive material will be used by the new personnel, has the employee/student been added to the Internal Radioisotope Permit and registered for training? Call 789-3613</b>
		17	The new employee/student understands that the PI/official supervisor can/should be contacted at any time to discuss safety concerns.

**\*\*WHMIS Coordinator** \_\_\_\_\_

***The signatures below indicate that the above material has been reviewed with this employee/student and the employee/student agrees to follow the prescribed lab and departmental safety procedures:***

**Employee/Student** \_\_\_\_\_

**Principal Investigator/ Official Supervisor\*** \_\_\_\_\_

\*Official Supervisor is a person whose supervisory responsibilities are defined in their job description

### Discussion questions for PI and new Lab Personnel

1. What are the hazards for 2-3 of the most hazardous/toxic chemicals or solutions that you use?
2. What biological risk group 2 agents or potential infectious material do you work with?
3. What are the routes of transmission of any hazards associated with this biological material?
4. What are the symptoms of infection with this material?
5. Would work with this material require Hepatitis B or other immunizations? Has this been started?
6. How do you protect yourself **and your co-workers** while working with the materials listed in #1 and #2?
7. When your experiments require use of a chemical or biological material that you haven't used before, what steps do you take before using it?
8. Are your lab's working solutions, and your own, (other than saline, PBS, culture medium) labeled with completed, individual WHMIS labels?
9. You are working late in the lab and have a major spill of one of the hazardous materials you have listed in #1. What should you do?
10. Considering your project as a whole, what are the major points in your own work where a risk is encountered and how do you plan to contain these risks?
11. Do you have any comments about your current procedures that would enable you to work more safely that your department should consider?

## Laboratory Safety Checklist for New Lab Personnel

- PI/Lab Supervisor should discuss the following statements/questions with the new lab personnel before they start work in the laboratory.
- When completed and all signatures have been obtained, the checklist should be submitted to and kept by the departmental office.

### Please Print

<b>Name:</b>	<b>Date:</b>
<b>Phone #:</b>	<b>Department:</b>
<b>Principal Investigator/Official Supervisor:</b>	<b>Building and Room #</b>
<b>Biosafety Permit #</b>	<b>Radiation Safety Permit #</b>

The questions on page three can be used as a template for discussion in conjunction with the questions below.

YES	N/A	STATEMENT/QUESTION	
		1	PI/Supervisor has discussed the nature of the research/project being conducted in the laboratory.
		2	PI/Supervisor has discussed hazardous components of the research including reference to the following as applicable.
			a. Chemical
			b. Biological
			c. Physical (including temperature, electrical, lifting/ergonomic, hi/low pressure, sharps)
			d. Radioactive
			e. Lasers or Radiation Emitting Devices (REDs)
		3	PI/Supervisor has identified the location of Material Safety Data Sheets (MSDS) and chemical inventories to the employee/student and demonstrated methods of access.
		4	Immunization requirements have been identified and offered if the employee will be working with/near vaccine-preventable human or animal pathogens or potentially infectious material. (Contact EHSO Occupational Health Coordinator (474-6438) if you require assistance with this risk assessment).
		5	PI/Supervisor has discussed the need for the employee/student to inform health care providers of the nature of the laboratory research during an accident or post-exposure medical visit.
		6	PI/Supervisor has reviewed the site-specific laboratory safety requirements with the employee/student, including working alone, personal lab hygiene and responsibilities for safety, site specific waste procedures, and emergency response contacts.
		7	Hazard assessment, use and limitations information concerning Personal Protective Equipment (PPE) required in laboratory has been reviewed and personnel have been provided with the appropriate personal equipment required (lab coat(s), safety glasses/goggles, gloves) and shown location of shared PPE (e.g. face shields, temp resistant gloves)
		8	Does the employee/student need a respirator? ( ) YES ( ) NO If yes, arrange for exposure evaluation, training and fit testing through the Environmental Health and Safety Office at 474-6633.

		9	Has the pertinent procedures for emergency response been identified to the employee/student for:
			a. Spills, Ventilation/fume hood failures, etc.
			b. Fire (Fire procedures and Fire Marshall identified?)
			c. Personal injury and/or medical emergency (First aid responders identified?)
			d. Accident/Incident reporting procedure
		10	Have all Safety and Emergency Equipment <b>locations and procedures</b> been identified to the employee/student?
			a. Emergency Shower
			b. Emergency Eyewash
			c. Fire Alarm Pull Station
			d. Fire Extinguisher
			e. First aid and Spill Kits
			f. Emergency Contact Phone #s
			g. Fume Hoods
			h. Biological Safety Cabinets (BSC)
			i. Flammable Storage Cabinets
			k. Others
		11	Have the site-specific waste procedures and locations of the Hazardous Waste Wall Charts (Lab waste, Biohazardous waste, Radioactive waste) been identified and explained to the employee/student:
			a. Solvents?
			b. Acids/bases?
			c. Radioactive material?
			d. Sharps/broken glass?
			e. Biohazardous material?
			f. Animal carcasses?
		12	Has the PI/Supervisor reviewed with the employee/student, the laboratory signage system and entrance requirements as indicated on the door? Contact EHSO 474-6633 for information on installation of door signage.
		13	If a radioactive material user, has the employee/student signed up for training with the Radiation Safety Office at 474-6633.
		14	If a biological material user, has the employee/student signed up for generic BSC and Biosafety training. Call 474-6633.
		15	All new lab personnel must view the "Basic Lab Safety and WHMIS" presentation and write and pass the test. WHMIS Coordinator signature below** indicates that this has been documented.
		16	<b>If radioactive material is being used in the lab, has the employee/student been added to the Radiation Safety Permit and registered for training. Call 789-3613</b>
		17	The new employee/student understands that the PI/official supervisor can/should be contacted at any time to discuss safety concerns.

**\*\*WHMIS Coordinator** \_\_\_\_\_

***The signatures below indicate that the above material has been reviewed with this employee/student and the employee/student agrees to follow the prescribed lab and departmental safety procedures:***

**Employee/Student** \_\_\_\_\_

**Principal Investigator/ Official Supervisor\*** \_\_\_\_\_

\*Official Supervisor is a person whose supervisory responsibilities are defined in their job description

### Discussion questions for PI and New Lab Personnel

1. What are the hazards for 2-3 of the most hazardous/toxic chemicals or solutions that you use?
2. What biological risk group 2 agents or potential infectious material do you work with?
3. What are the routes of transmission of any hazards associated with this biological material?
4. What are the symptoms of infection with this material?
5. Would work with this material require Hepatitis B or other immunizations? Has this been started?
6. How do you protect yourself **and your co-workers** while working with the materials listed in #1 and #2?
7. When your experiments require use of a chemical or biological material that you haven't used before, what steps do you take before using it?
8. Are your lab's working solutions, and your own, (other than saline, PBS, culture medium) labeled with completed, individual WHMIS labels?
9. You are working late in the lab and have a major spill of one of the hazardous materials you have listed in #1. What should you do?
10. Considering your project as a whole, what are the major points in your own work where a risk is encountered and how do you plan to contain these risks?
11. Do you have any comments about your current procedures that would enable you to work more safely that your department should consider?

**3. Identify any Prohibited Activities**

**4. Identify Training And Instruction Required**

<ul style="list-style-type: none"><li><input type="checkbox"/> WHMIS</li><li><input type="checkbox"/> TDG</li><li><input type="checkbox"/> Respiratory Protection</li><li><input type="checkbox"/> Infection Control</li><li><input type="checkbox"/> Lab Safety</li><li><input type="checkbox"/> First aid &amp; CPR</li><li><input type="checkbox"/> Fire extinguisher training</li><li><input type="checkbox"/> Health and Safety Orientation</li><li><input type="checkbox"/> Radiation Safety</li></ul>	<ul style="list-style-type: none"><li><input type="checkbox"/> Emergency Procedures</li><li><input type="checkbox"/> Supervision and Safety</li><li><input type="checkbox"/> Ladder safety</li><li><input type="checkbox"/> Other (describe)</li></ul>
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**5. Emergency and survival supplies required for traveling/working under extreme conditions ?**

**6. First Aid supplies/requirements ?**

SIGNATURE OF THE SUPERVISOR:

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SIGNATURE OF THE WORKER(S)

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SIGNATURE OF THE WORKER REPRESENTATIVE (LAHSC Worker Co-Chair)

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**Identify hazardous substances the worker may work with, transport or handle while working alone or in isolation:**

LAB CHEMICALS	PESTICIDES	PRESSURIZED GASES
PATHOGENS	HAZARDOUS WASTE	INDUSTRIAL CHEMICALS
INFECTIOUS AGENTS	LASERS	NUCLEAR SUBSTANCES
OTHER (DESCRIBE)		

**First Aid Kit**

Is a personal first aid kit required for the worker who works alone?

(Worker does not have ready access to a standard first aid kit as required to be provided under subsection 5.12(1) of MR 217/2006).

Yes \_\_\_ No \_\_\_

**OVERALL RISK CLASSIFICATION OF WORK:**

     **Low**

(minimal hazard with respect to the activity and the work environment. Normally check-in and check-out with contact person at beginning and end of work shift. Examples: office work, report writing, etc.)

     **Medium**

(minor hazards with control measures in place to control risk. Requires more regular contact or work site monitoring. Examples include custodial duties, laboratory work with low hazard materials, light duty maintenance )

     **High**

(significant hazards and higher risk potential for injury/illness. Requires another worker/supervisor in close proximity with ability to make immediate contact. Examples: laboratory work with hazardous controlled products,