

LASH MILLER CHEMICAL SECURITY PROGRAM

Table of contents

[1.0 Introduction](#)

[1.1 Purpose](#)

[1.2 Scope](#)

[2.0 Abbreviations and Terms](#)

[3.0 Responsibilities](#)

[3.1 Environmental Health and Safety Office](#)

[3.2 Department of Chemistry](#)

[3.3 Principal Investigator/ Supervisor](#)

[3.4 Laboratory Personnel](#)

[4.0 Procedural Guidelines](#)

[4.1 Training](#)

[4.2 Material Control and Accountability](#)

4.2.2 Chemicals of Interest Tracking

[4.3 Shipping and Receiving](#)

4.3.1 Importing and Permits

[4.4 Security and Access](#)

4.4.1 Security Vulnerability Assessment (SVA)

4.4.2 Physical Security

4.4.3 Electronic Security

4.4.4 Operational Security

4.4.5 Information Security

[4.5 Emergency Response Procedures](#)

4.5.1 Suspicious Persons

4.5.2 Security Incidents

[4.6 Record Keeping](#)

[4.7 Auditing](#)

1.0 Introduction

Laboratory safety keeps people safe from hazardous materials, and the Lash Miller (LM) Chemical Security program keeps hazardous materials safe from people.

This program is intended for the reduction of harm as a result of:

- Theft or diversion of chemicals of interest (COIs), biologicals, and radioactive or proprietary materials
 - Such materials could be stolen from the laboratory, diverted or intercepted in transit between supplier and laboratory, at a loading dock, or at a stockroom, and then sold or used, directly or as precursors, in weapons or manufacture of illicit substances
- Threats from activist groups
- Intentional release of, or exposure to, hazardous materials
- Sabotage or vandalism of COIs or high value equipment
- Loss or release sensitive information; and
- Rogue work or unauthorized laboratory experimentation
- The Government of Canada sets regulations governing the use and storage of certain hazardous materials and COIs including but not limited to importing, exporting, declarations, inspections, selling, licences, and record keeping. These regulations are intended to prevent the outcomes listed above.

1.1 Purpose

The purpose of this document is to outline the requirements to facilitate the Department of Chemistry's compliance with Canadian regulations regarding COIs. A good laboratory security program should, among other things, increase overall safety for laboratory personnel (faculty, staff, and students) and the public, improve emergency preparedness by assisting with preplanning, and lower the organization's liability.

1.2 Scope

This program applies to all faculty, staff, students, and contractors/ visitors to Lash Miller Laboratories, 80 St. George Street.

2.0 Abbreviations and Terms

COI – Chemical of Interest (could be used directly, or as precursors, in weapons or manufacture of illicit substances).

CWC - Chemical Weapon Convention

Dual-Use Chemical - Chemicals used for both beneficial and harmful purposes

HECHMET- Higher Education Cooperative for Hazardous Material and Equipment Tracking; a chemical inventory system.

Schedule 1 Chemicals - Chemicals known to be chemical warfare agents and their precursors. These chemicals have little or no use other than in the production of chemical weapons. There are, however, some in use in Canada for non-military research purposes e.g. nitrogen mustards, saxitoxin and ricin are being used for pharmaceutical medical research and diagnostic purposes.

Schedule 2 Chemicals - Chemicals and compounds that are key precursors to chemical warfare agents but have some commercial utility. These chemicals are, with a few exceptions, not produced in large commercial quantities for purposes not prohibited under the convention. In Canada, main commercial use involves thiodiglycol and dimethyl methyl phosphate.

Schedule 3 Chemicals - Chemicals that can be used to produce chemical warfare agents but are produced in large quantities for commercial use. In Canada, the most common are triethanolamine, methyldiethanolamine, and chloropicrin.

SDS- Safety Data Sheet

SOP- Standard Operating Procedure

SVA- Security Vulnerability Assessment

3.0 Responsibilities

3.1 Environmental Health and Safety Office

The Environmental Health and Safety Office is responsible for:

- Maintaining the University's electronic chemical inventory in HECHMET
- Maintaining an active list of groups possessing COI
- Coordinating the annual declarations of CWC chemicals to the Canadian National Authority and the Organization for the Prohibition of Chemical Weapons

3.2 Department of Chemistry

The Department of Chemistry is responsible for:

- Implementing and ensuring the compliance of the chemical security program
- Ensuring proper documentation is used for the ordering, import, and export of COI
- Physical security of the Lash Miller Chemical Laboratories building

3.3 *Principal Investigator/ Supervisor*

The principal investigator/ supervisor is responsible for:

- Supporting and participating in the chemical security procedures outlined by the Department of Chemistry
- Ensuring all COI are received and stored in secure areas
- Maintaining an up to date chemical inventory to HECHMET
- Being aware of what chemicals of interest are in their possession
- Ensuring that strangers and unauthorized visitors do not have access to COI in their possession
- Ensuring that COIs are kept locked and secured in laboratories when unattended
- Providing the Environmental Health and Safety Office with all necessary information to meet regulation requirements
- Documenting laboratory personnel training
- Ensuring that laboratory personnel follow the procedures outlined in the [Chemical Security Standard Operating Procedure](#) (SOP)

3.4 *Laboratory Personnel*

Laboratory personnel are responsible for:

- Supporting and participating in the procedures outlined in the [Chemical Security SOP](#)
- Reporting all suspicious incidents to the Principal Investigator/ Supervisor

4.0 Procedural Guidelines

4.1 *Training*

Often, those working in laboratories are unaware of the importance of chemical security. It is important that all laboratory personnel are trained on the security measures, response, and importance of compliance with the security measures. This training will encompass proper security procedures to be followed by all laboratory personnel and general information regarding chemical security. As a part of the onboarding training requirements, the [Lash Miller Site-Specific Training Checklist](#) includes a section on chemical security. Additionally, when completing the Lash Miller Lab/Group-Specific Training Checklist, it is necessary to discuss and show new laboratory personnel the locations of COIs in the laboratory as well as the lab-specific chemical security measures such as if they are stored in a lockable cabinet, logs, etc.

4.2 *Material Control and Accountability*

Material control and accountability consists of a system of recording, reporting, and audits which begins when the COI (weapon precursor or highly toxic/ lethal substance) is ordered and ends when it is used up or destroyed. This will reduce the likelihood of theft or loss, as all COIs will be accounted for.

4.2.1 Chemical Inventory System

An accurate and updated chemical inventory system is necessary to ensure the control and accountability of all COIs at all times. In an event of theft or loss, the inventory system can be used to determine where and how much of the COI is unaccounted for. The chemical inventory management system used at the University of Toronto is the Higher Education Cooperative for Hazardous Material and Equipment Tracking (HECHMET). This system can be accessed by many users simultaneously and includes the location, quantity, barcode number, CAS number, and product information for each chemical.

4.2.1.1 Hazard Information

Information included in the chemical inventory system regarding COIs could be useful to those attempting theft, release, or sabotage of these chemicals, as their exact location in the Lash Miller building, as well as their quantity, is included. Therefore, it is necessary to treat this information as sensitive and take the appropriate steps to ensure it is protected. Follow the [Security Vulnerability Assessment \(SVA\)](#) checklist to ensure the necessary chemical security measures are currently in place or are implemented. Hazard information including the location and quantity of COIs located in Lash Miller Chemical Laboratories is included in the appendix.

4.2.1.2 Inspections

Regular inspections of the chemical inventory held by each laboratory, as well as by Chem Stores, will ensure that HECHMET continues to provide an accurate representation of the chemicals present within Lash Miller Chemical Laboratories. An accurate inventory will allow the necessary chemical security measures to be implemented in the appropriate high chemical density areas. It will also ensure that the appropriate emergency procedures are put into place. Section 4.7 of this document details the SOP to follow with regards to regular COI inspections and audits.

4.2.1.3 Tracking

Tracking usage of COIs in HECHMET is necessary to ensure an accurate record of the existing COIs in Lash Miller Chemical Laboratories. When chemicals are received and when the chemical is depleted and the container is being disposed of, or the chemical is relocated, HECHMET needs to be updated with this information. HECHMET also enables the user to update the current quantity of chemical at any time, as it is used. An accurate inventory will inform on the necessary chemical security measures and laboratory specific training. Refer to the [Chemical Inventory Management SOP](#) for more information.

4.2.1.4 Waste Management

Waste management plays an important role in chemical security. When it is time to dispose of COIs, the waste management system ensures no theft or loss occurs. In Lash Miller Chemical Laboratories, chemical waste is collected on the 7th floor where chemicals are separated into compatible groups and taken to the correct facility for disposal.

4.2.2 Chemicals of Interest Tracking

Certain COIs can be used for purposes such as suicide and homicide. These chemicals are considered very harmful to human health and therefore pose a significant chemical security risk. Through tracking the usage of each poisonous material including user and quantity, potential security incidents such as theft will become evident. To assist in ensuring these chemicals are used only by authorized personnel and for research purposes, follow the [Chemical Security SOP: Tracking Chemicals of Interest](#).

4.3 Shipping and Receiving

4.3.1 Importing and Permits

The Chemical Weapons Convention (CWC), which Canada has signed and enforces through the Canadian National Authority (CAN), prescribes chemical substances that are prohibited, and substances that need an import permit (GIP-108) in order to import any amount into Canada. University of Toronto does not store any Schedule 1 chemicals; however, this regulation applies to both Schedule 2 and Schedule 3 chemicals. Please refer to the [Chemical Security SOP](#) for details on included chemicals and how to submit the required import form. It is important not to unnecessarily import these chemicals from the United States or other countries, as the process for a retroactive import permit is cumbersome. Ensuring that no chemicals being imported fall under the CWC regulations unless necessary will ensure compliance with the convention. Highly hazardous chemicals also require a permit to import.

4.4 Security and Access

When considering the security of a facility or a laboratory, there are many components that play a role and a good security program should encompass all of them and result in increased overall safety for laboratory personnel and the public, improvement of emergency preparedness by assisting with preplanning, the lowering of the organization's liability and overall, the physical protection of hazardous materials. Physical security, electronic security, operational security, and information security all play a role in achieving this goal.

4.4.1 Security Vulnerability Assessment (SVA)

An SVA is a systematic process that will evaluate the likelihood of a threat against the laboratory and the severity of potential consequences. An SVA must be completed to fully characterize the security state of Lash Miller laboratories and determine the ideal countermeasures to deter, detect, delay, and respond to potential security threats. This assessment includes finding all weaknesses and vulnerabilities in the security of each laboratory and Lash Miller facilities related to certain critical assets and will enable potential security threats to be minimized. Refer to the SVA Checklist for a detailed SVA to be completed by each laboratory and by the Department of Chemistry, including a description of potential countermeasure recommendations. It is necessary to perform both a large scale, general SVA from the perspective of the Lash Miller building, as well as several smaller scale SVAs on an individual laboratory basis.

4.4.2 Physical Security

This branch of security is concerned with physical measures that are designed to protect COIs and high value equipment. Examples from Lash Miller Chemical Laboratories include lockable doors, chemical storage container locks, or tamper resistant door jams.

4.4.2.1 Building Security

Building security encompasses all physical measures that are applied to the building including all exterior doors, exterior windows, and common spaces. The Department of Chemistry is responsible for the SVA Checklist to ensure the building security of Lash Miller Chemical Laboratories.

4.4.2.2 Laboratory Security

Laboratory security represents all physical chemical security measures that are applied to an individual laboratory. This includes all lab-entry doors, chemical storage, and any other chemical security measures applied to laboratories in the Lash Miller Chemical Laboratories building. Each principal investigator/ supervisor is responsible for completing the SVA Checklist to ensure the security of their laboratory and checking and reporting issues to the Director of Operations and Technical Services (DOTS).

4.4.2.3 Chemical Storage

The lockable storage of COIs within a laboratory setting is also an important part of physical security. This is a security measure recommended for some COIs due to their ability to be used as weapons or explosives or due to their lethality. Using the SVA Checklist, it can be determined if this security measure is present or needed in individual laboratories.

4.4.3 Electronic Security

Electronic security includes access control systems, alarm systems and, password protection procedures. Each of which is important to ensure chemical security. These systems will assist in ensuring hazardous chemicals are only accessible to those who are cleared to use them and assist in identification should a security incident occur. Follow the SVA Checklist to ensure the necessary electronic chemical security measures are currently in place or are implemented. When renovating spaces, consider updating the physical security access to laboratories.

4.4.4 Operational Security (Administrative Controls)

A security system is only as strong as the individuals who support it. Among the goals of implementing operational measures are to increase awareness of security risks and protocols, to provide authorization for people who need access to a given area or material, and to provide security training. Some examples of operational security measures include a sign-in system for lockable cabinets where COIs are stored, unknown visitor and unauthorized entry "tailgating" awareness, and chemical use tracking. This is a very important element of this chemical security program, as it can be directly influenced by members of each laboratory, through the

procedures that they follow daily. Follow the SVA Checklist to ensure the necessary operational chemical security measures are currently in place or are implemented.

4.4.5 Information (Data) Security

Information and data security can be as critical as security of equipment and materials. Loss of data and computer systems from sabotage, viruses, or other means can be devastating for a laboratory. The issue of dual use applies to information as well as laboratory materials. Over the years, several examples of cybersecurity breaches have led to loss of sensitive information. Detailed information regarding a COIs location, or sensitive research data may find its way into the public domain, creating a new resource for those with illicit intentions. Follow the SVA Checklist to ensure the necessary information chemical security measures are currently in place or are implemented.

4.5 Emergency Response Procedures

Emergency response procedures include necessary responses to potential security threats and suspected security incidents.

4.5.1 Suspicious Persons

Suspicious persons are generally not known to facility staff and generally have no means of identification or credentials. A suspicious person or activity may include a person who does not work at the facility who has no valid reason for being in an area where COIs are stored, someone asking questions regarding COI, person observed taking photos or casing the facility, or an employee exhibiting suspicious behavior that is outlined in Section 7 of the [Chemical Security SOP](#). It is important for laboratory personnel to maintain a continued awareness of ongoing activities within Lash Miller Chemical Laboratories.

4.5.2 Security Incidents

Security incidents still may occur even if all chemical security measures remain in place. If a security incident does occur such as a facility break in or theft, immediately report by calling campus police (8-2323). If you see the security breach as it is happening, do not engage, and immediately report by calling the emergency response line 8-2222.

4.6 Record Keeping

Records will be kept of the tracking of each COI as well as the import of any COIs regulated under the CWC. These records will be logged and kept for a length of time according to the guidelines in the [Chemical Security SOP](#).

4.7 Auditing

To ensure laboratory compliance with the chemical security program, a section regarding chemical security is included in the workplace inspection checklist. This inspection will be completed annually by

the joint health and safety committee. Additionally, an inventory audit should be completed annually to ensure that HECHMET information is representative of the true inventory of each laboratory. An audit of the chemical security program will also be completed by the Department of Chemistry every three years.