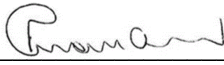





## Risk Management Manual Program

Complete Program Title: <b>Battery Recycling and Disposal Program</b>	Risk Management Manual (RMM) Number: <b>506</b>
Approved by:   <b>Vice-President, Administration</b>   <b>President and Vice-Chancellor</b>	Date of Most Recent Approval: <b>March 2021</b>
Date of Original Approval: <b>December 2008</b>	Supersedes/Amends Program dated: <b>January 2014</b>
Responsible Executive: <b>Vice-President, Administration</b>	Enquiries: <b>Environmental and Occupational Health Support Services (EOHSS) <a href="mailto:ehss@mcmaster.ca">ehss@mcmaster.ca</a></b>
<b>DISCLAIMER:</b> <i>If there is a discrepancy between this electronic program and the written copy held by the program owner, the written copy prevails.</i>	

### 1 PURPOSE

- 1.1 To provide a system for environmentally responsible recycling and disposal of used batteries that protects individuals, the natural environment, and McMaster University property.
- 1.2 To ensure compliance with environment-protection legislation and best practices which have the potential to impact the environment. This program is intended for used batteries generated from the University only. Individuals who have batteries to dispose of from their home must continue to follow household hazardous waste procedures.

### 2 SCOPE

- 2.1 All faculty, staff, students, volunteers, and contractors conducting recycling and disposal activities at any location owned or overseen by McMaster University.

### 3 RELATED DOCUMENTS

- 3.1 Environmental Protection Act of Ontario R.S.O. 1990
- 3.2 RMM #100 McMaster University Workplace and Environmental Health and Safety Policy

- 3.3 RMM #103 Environmental Protection Act of Ontario & Other Federal, Provincial, and Municipal Environmental Statutes
- 3.4 RMM #502 Hazardous Waste Management Program
- 3.5 RMM #505 Transportation of Dangerous Goods Program

## 4 DEFINITIONS

- 4.1 **Supervisor:** Person who has charge of a workplace or authority over a worker(s).
- 4.2 **Worker:** means any of the following, but does not include an inmate of a correctional institution or like institution or facility who participates inside the institution or facility in a work project or rehabilitation program:
  - a. A person who performs work or supplies services for monetary compensation.
  - b. A secondary school student who performs work or supplies services for no monetary compensation under a work experience program authorized by the school board that operates the school in which the student is enrolled.
  - c. A person who performs work or supplies services for no monetary compensation under a program approved by a college of applied arts and technology, university or other post-secondary institution.
  - d. Such other persons as may be prescribed who perform work or supply services to an employer for no monetary compensation (“travailleur”).
- 4.3 **Battery:** an electrochemical cell (or enclosed and protected material) that can be charged electrically to provide a static potential for power or released electrical charge when needed.
- 4.4 **Alkaline Battery:** a type of power cell dependent upon the reaction between [zinc](#) and [manganese oxide](#). The battery gets its name because it has an [alkaline](#) electrolyte of potassium hydroxide, as opposed to the acidic electrolyte of the zinc-carbon batteries which are offered in the same nominal voltages and physical size.
- 4.5 **Lead-Acid Battery:** a type of battery composed of a Lead-dioxide cathode, a sponge metallic Lead anode and a Sulphuric acid solution electrolyte.
- 4.6 **Lithium-Ion Battery:** a type of [rechargeable battery](#) in which a [lithium](#) ion moves between the [anode](#) and [cathode](#). The lithium ion moves from the anode to the cathode during discharge and from the cathode to the anode when charging. Most commonly used in consumer electronics.
- 4.7 **Ensure:** take every reasonable precaution to achieve the stated objective.
- 4.8 **Nickel-Cadmium Battery:** a type of [rechargeable battery](#) using [nickel oxide hydroxide](#) and metallic [cadmium](#) as [electrodes](#).

#### 4.9 **Acronyms:**

**EOHSS** - Environmental and Occupational Health Support Services

**FHSSO** - Faculty of Health Science Safety Office

**EPA** - Environmental Protection Act

**CJHSC** - Central Joint Health and Safety Committee

**RMM** – Risk Management Manual

## 5 **RESPONSIBILITIES**

### 5.1 **Role of Senior Managers (Deans / Directors / Chair / Managers):**

Senior Managers shall:

- provide the resources and support necessary to implement and maintain the battery recycling and disposal program within their area of responsibility.

### 5.2 **Role of Supervisors (Administrative and Academic)**

The responsible supervisors shall:

- ensure that the practices and procedures for handling the recycling and disposing of used batteries are followed by all individuals supervised;
- ensure that all individuals supervised are trained in environmental best practices related to the handling, recycling and disposal of used batteries;
- inform EOHSS/FHSSO immediately upon receiving notice of any significant environmental occurrence.

### 5.3 **Role of Individuals (Workers, Students, Volunteers, Contractors)**

Individuals shall:

- follow all prescribed practices and procedures related to the recycling and disposal of used batteries; and
- dispose of used batteries at the nearest battery recycling location (see Appendix B).

### 5.4 **Role of Environmental and Occupational Health Services (EOHSS)**

The EOHSS shall:

- monitor the effectiveness of the Battery Recycling and Disposal Program;
- provide input based on changing legislation and/or best practices for program updates;

- report if necessary any occurrence with impacts to the natural environment to the appropriate legislative authority; and
- review all hazardous waste best practices and handling procedures regularly for the legislative compliance and safety-related processes.

#### 5.5 **Role of Central Joint Health and Safety Committee:**

The CJHSC shall:

- review the Battery Recycling and Disposal Program on a scheduled basis; and
- document this review.

### 6 **PROCEDURAL GUIDELINES**

6.1 There is the potential for hydrogen build up when used batteries are packaged together. Used batteries must be separated into the following categories (see Appendix A):

- Alkaline Batteries
- Lead-Acid Batteries
- Lithium-Ion Batteries
- Nickel-Cadmium Batteries

6.2 Recycling and disposal pails/bins will be identified with labels and pictures for sorting of used batteries.

6.3 Used batteries must not be placed in the same pail/bin without sorting them first. Using the instructions and visual picture guide, individual batteries are to be placed into the appropriate recycling/disposal pail/bin.

6.4 If a used battery does not meet the above sorting criteria, EOHSS or FHSSO should be contacted to make arrangements for proper recycling and disposal.

### 7 **RECORDS**

7.1 The responsibility for maintaining records of used battery recycling and disposal shipments is assigned to EOHSS to for campus buildings excluding the McMaster University Medical Centre.

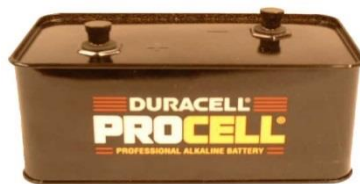
## APPENDIX A

### Sample Types of Batteries:

The following are the 4 types of used batteries that can be recycled at each of the designated areas:

#### Alkaline Batteries:

- Flashlight Batteries
- Lantern Batteries
- Batteries for commonly used products



#### Lead-Acid Batteries:

- UPS (Uninterruptable Power Supplies)
- Automotive and traction applications
- Sealed battery types available for use in portable equipment



#### Lithium Ion Batteries:

- Li-ion Batteries
- Cell Phone Batteries
- Laptop Batteries



### Nickel-Cadmium Batteries:

- Ni-Cad Batteries
- Battery Packs
- Rechargeable Batteries



## APPENDIX B

### Buildings with Battery Disposal Bins:

- **A.N. Bourns Science Building Stores –Room B166**
- **Commons Building – Main Entrance/Service Desk, Room 129**
- **David Braley Athletic Centre – Main Entrance/Joan Buddle Service Desk**
- **Mary Keyes Residence – Main Entrance/Service Desk, Room 126**
- **McMaster University Student Centre – OPIRG Office, Room 229**
- **McMaster University Medical Centre (MUMC) Bookstore– Room 1G1**
- **McMaster Innovation Park – McMaster Industry Liaison Office (MILO)**
- **McMaster Automotive Research Centre (MARC)**
- **Mills Library – Main Floor**
- **One James North**