Laboratory Chemical Waste Management Practices

1.0 Purpose / Background

Research, teaching, and clinical laboratories produce a variety of waste chemicals that may be subject to regulatory management standards and, if improperly managed in the laboratory, could pose a safety risk to laboratory personnel and the environment.

2.0 Scope

This practice applies to teaching, research, and clinical laboratories at Duke University, Duke University Medical Center, and Duke University Health Systems.

3.0 Procedures

Any laboratory that generates waste chemicals must be familiar with the Duke University/Medical Center "Chemical Waste Policy" prior to producing chemical wastes and must register with the Occupational and Environment Safety Office prior to requesting a waste pickup. Procedures to obtain a generator's ID can be found at http://www.safety.duke.edu/SafetyManuals/LabManual/index.htm. Waste chemicals generated in a *laboratory* must be managed in accordance with the following practices:

3.1 **Accumulation of Waste Chemicals:** Waste chemicals accumulated either during the operation of a process or otherwise accumulated in the laboratory must be placed into containers that are in good condition and compatible with the collected waste.

3.2 **Container Labeling and Marking**: Any container used to collect or accumulate waste chemicals must be labeled and marked with the following information using the label shown in attachment 1:

- ***Container Contents*** - Containers used to accumulate waste chemicals must be clearly marked with the words **"Waste (name of chemical) "**. Containers must be marked or labeled with the date waste is first placed into that container.

- ***Waste Collection Dates*** - Containers must have an "open date" listed on the container label and, when full or no longer being filled, a "fill date". The "open date" is the earliest date that waste is placed in the container whereas the "fill date" is the date when the container has been filled and will no longer be used to accumulate waste.

- ***Small or Odd Shaped Containers*** – Small or odd shaped containers used to store chemical waste for pick-up or used to store chemical wastes during a laboratory clean out may use the label illustrated in attachment 2. If the container is too small for a label, place the container in a larger container, seal, and then properly label the larger container.

3.3 **Container Management** – Containers used to collect or accumulate waste chemicals must be managed in the following manner:

- ***Closed Containers*** - Containers must be kept closed except when adding or removing wastes.
  - Chemical waste collected during processing (e.g., chromatography) on a continuous basis must be collected via tubes that are fed through the cap or container closure so that the container is closed.
  - Containers used to collect waste chemicals on a frequent, routine basis (e.g. solvent washes) must be closed at all times except when adding or removing waste.
- ***Clean Containers*** - Containers should be kept clean with no visible contamination on the outside of the container and markings or labels on the container must be readable and not defaced.
- ***Secondary Containment*** - Areas where waste chemicals are accumulated must have secondary containment sufficient to collect incidental spills that might occur when adding waste to containers.
- ***Full Containers*** - Containers should not be overfilled. "Full containers" should have at least a 10% head space to allow for expansion.

3.4 **Chemical Waste Stored in the Laboratory**:

Full containers used to accumulate chemical waste, unused or unopened chemicals or unknown chemicals that are temporarily stored awaiting removal

by OESO must be managed in the following manner.

3.4.1 **Container Management –** Containers used to store waste chemicals in the laboratory:

- Must be labeled and marked as outlined in paragraph 3.2,
- Must be kept closed and clean with no visible contamination of the outside of the container. Markings and labels on the container cannot be defaced such that they are no longer legible.
- All containers must have secondary containment sufficient to hold the volume of the container should an accidental spill occur during storage.

3.4.2 **Container Storage** - Filled containers must be stored in a secure area under the control of the operator.

3.4.3 **Removal of Chemical Wastes –** Filled containers of chemical wastes should be stored no longer than **180 days** before requesting a waste pick-up. In addition, no more than **50 gallons** of chemical waste may be stored in a laboratory at any one time.

3.5 Unused, Unopened or Unknown Chemicals in the Laboratory:

3.5.1 **Container Labeling and Marking**:

3.5.1.1 ***Unused or Unopened Chemicals*** **–** Containers holding unused or unopened chemicals no longer needed by the laboratory should be labeled with the date that the chemical is considered to be no longer needed. Notify OESO to collect and remove from the laboratory.

3.5.1.2 ***Unknown Chemicals–*** Containers holding chemicals that cannot be identified by chemical name, chemical constituents, or waste generating process by laboratory personnel should be labeled as **Waste Unknown** and with the date that they are considered to be no longer needed.

3.5.2 **Removal of Unused, Unopened or Unknown Chemicals –** Chemicals identified as no longer needed by the laboratory and that are unused, unopened, or unknown ***must*** **be removed from the laboratory no later than 30 days after being designated as no longer needed**.

3.6 Laboratory Shutdowns or Close-Outs:

Whenever there is a significant process change in a laboratory that will generate waste chemicals or whenever a laboratory is shutdown or closed out the principal investigator must, before leaving that laboratory, notify OESO and ensure that all waste chemicals are properly identified, labeled and marked so that they can be properly removed from the laboratory. Laboratory close-out procedures, including a close-out inspection by OESO, can be found in Section 5 of the Laboratory Safety Manual at http://www.safety.duke.edu/SafetyManuals/LabManual/index.htm.

4. Roles & Responsibilities

The following key personnel will participate in the implementation of this practice:

Principal Investigators/Laboratory Directors – Principal Investigators or Laboratory Directors are responsible for ensuring that this practice is implemented in laboratories. They may choose to assign or designate a laboratory waste manager to implement the practice.

Laboratory Waste Manager – The laboratory manager, supervisor or other designated individual must implement the procedures outlined above in the laboratory or laboratories over which they have been assigned control.

OESO – OESO will provide support and oversight to the laboratories through education, training, routine assessments of laboratory performance, and scheduled chemical waste pick-ups.

5. Training

Principal Investigators, laboratory waste managers or other persons who manage chemical waste in the laboratory must complete a "Laboratory Waste Management Course" developed and presented by OESO available at the Safety Office Website. Training records will be maintained and updated by OESO.

6. References

- **Standards -**

  40 CFR Parts 260- 262. – Hazardous Management Standards for Generators

- **Other Polices/Practices -**

  "Chemical Waste Policy – Duke University/Medical Center", Occupational, Environmental Safety Office, January 2000.

Attachment 1 - Sample Container Label:

000000001B 000000001B

WASTE ACCUMULATION CONTAINER

LAB ID#_____

WASTE_____

_____

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_____

OPEN DATE_____ FILL DATE_____

Attachment 2 - Small Container Label:

000000000A 000000000A

WASTE_____

LAB ID#_____ DATE_____