THE OHIO STATE UNIVERSITY

Chemical Exposure Monitoring

Safety Program

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Table of Contents

1. Introduction

Numerous personnel at The Ohio State University (Ohio State) may be required as part of their normal job duties to work around hazardous materials. While these materials can be useful in their desired capacities, they can also be potentially hazardous to an individual's health if proper precautions are not implemented. Hazardous materials can be found in a number of common locations such as laboratories, maintenance and utilities operations, janitor closets, athletic facilities, etc.

Environmental Health and Safety (EHS) has created this Chemical Exposure Monitoring Program to ensure all individuals on campus are safely using hazardous chemicals in any facility and are not being exposed to levels above the Permissible Exposure Limits (PEL) set by the Occupational Safety and Health Administration (OSHA).

2. Responsibilities

Environmental Health and Safety

EHS has the following responsibilities as part of the Chemical Exposure Monitoring Program:

- Ensuring the Chemical Exposure Monitoring Program is reviewed, maintained, and updated.
- Conducting and supervising chemical exposure monitoring processes. Exposure monitoring for compliance with regulatory exposure limits will be funded by EHS; exposure monitoring for accreditation or other purposes will be funded by the applicable college or administrative unit.
- Utilizing accredited OSHA/NIOSH methods, when applicable, to complete chemical exposure monitoring.
- Creating and maintaining an active database of all chemical exposure monitoring sessions performed on campus.
- If necessary, providing recommendations for additional engineering controls, administrative controls, or personal protective equipment (PPE) to be used to protect employees from overexposure.
- Keeping chemical exposure assessment records on file as required by OSHA regulations. EHS will make available exposure assessment records when requested by employees or their designated representatives.

Principal Investigators (PIs)/Supervisors

All PIs and supervisors are to ensure that their employees are not being exposed to any concentrations above the permissible exposure limit set by OSHA or other regulatory agencies. It is the PI and/or supervisor's responsibility to contact EHS to request exposure monitoring when overexposures are suspected. This responsibility includes providing all necessary control methods recommended by EHS, such as engineering controls and personal protective equipment.

PIs in research laboratories where chemicals are utilized must maintain a Chemical Hygiene Plan customized for the potential hazards that can be found in their laboratory. This plan needs to apply to all individuals in the laboratory that use hazardous chemicals and must be accessible to all employees. PI's are responsible for making sure all employees have read and understood all information in the Chemical Hygiene Plan before working with hazardous chemicals. Additional information regarding Chemical Hygiene Plans can be found at http://www.ehs.osu.edu/ResBioSafety/ChemHP.aspx.

All supervisors and PI's are to ensure that all Standard Operating Procedures (SOPs), Hazard Communication documents/labels, and any other applicable forms correlating with hazardous substances are available and understood by all employees.

All supervisors and PIs are to ensure all employees have taken all required training associated with the chemicals used in their facility.

Ohio State Employees

All employees are to follow all aspects of the Chemical Exposure Monitoring Program while being employed in a facility that uses hazardous substances. Employees are required to use required control methods, such as proper PPE, training, and working techniques. Employees must report any chemical exposure symptoms to their supervisor and complete an Employee Accident Report.

All PIs and supervisors are to ensure that their employees are not being exposed to any concentrations above the permissible exposure limit set by OSHA or other regulatory agencies. It is the PI and/or supervisor's responsibility to contact EHS to request exposure monitoring when overexposures are suspected. This responsibility includes providing all necessary control methods recommended by EHS, such as engineering controls and personal protective equipment.

3. Definitions

Action Level – Concentration level, calculated as an 8-hour time weighted average, that initiates certain required activities such as exposure monitoring and medical surveillance.

Ceiling Limit – The concentration that should not be exceeded during any part of the exposure.

Chemical Hygiene Plan – A written program developed and implemented by the employer which sets forth procedures, equipment, personal protective equipment, and work practices that are capable of protecting employees from the health hazards presented by hazardous chemicals used in that particular workplace.

Permissible Exposure Limit (PEL) – Regulatory limits on the amount of concentration of a substance in the air and are based on an 8-hour time weighted average.

Safety Data Sheet (SDS) – A document provided by the chemical manufacturer that provides information on the physical data, toxicity, health effects, first aid, storage, disposal, spill procedures, and other key components to individuals that use the chemical.

Short-term Exposure Limit – The concentration to which an individual can be exposed continuously for a short period of time, typically 15 minutes, without suffering from adverse health effects.

Threshold Limit Value (TLV) – The airborne concentration of chemical substances representing conditions under which it is believed that nearly all workers may be repeatedly exposed to without adverse effects.

Time-Weighted Average – In air sampling, the average air concentration of contaminants during a given period, usually eight (8) hours.

4. Chemical Exposure Monitoring Process

Initial Monitoring

Upon notification from a PI or supervisor that employees may be being exposed to a certain substance (chemical) in unknown concentrations near the action level or PEL, or if required by regulation or accreditation, EHS will conduct initial chemical exposure monitoring. PELs for a specific chemical can be found on the manufacturer's Safety Data Sheet (SDS) as required by the Chemical Hygiene Plan.

An initial chemical exposure assessment may also be requested by any employee by contacting their supervisor and EHS.

Periodic Monitoring

If the initial chemical exposure monitoring determines that concentrations are above the action level or PEL, or if required by accreditation, a periodic monitoring program may be generated by EHS. If implemented, this monitoring program must be followed by all individuals that are in the facility and work with the hazardous substance.

Termination of Monitoring

If initial monitoring results conclude that concentrations are lower than the action level, or if two (2) consecutive periodic monitoring assessments show the concentration has dropped below the action level, monitoring may be terminated for that facility. Termination of monitoring will not be applicable for areas that require annual exposure assessments for accreditation purposes.

Chemical exposure monitoring will be conducted, however, if any change in the process, either procedural or chemical, involving a hazardous substance occurs.

Employee Notification of Monitoring Results

EHS must provide chemical exposure monitoring results to the tested individual and their supervisor, if applicable, within 15 working days after receiving the results. Individuals will be informed of monitoring results either electronically or in person.

5. Hierarchy of Control Methods

If concentrations of a hazardous substance are found to be above recommended limits, control methods will be required to be put into place in order to reduce exposure levels. EHS will use the hierarchy of control methods, in the preferred order below, to create a practical approach to reduce or eliminate exposures. Appendix A displays the hierarchy of control methods used by EH&S.

Elimination

This method involves completely removing a hazardous substance from the process. This is the most effective and preferred way to remove potentially dangerous exposures because the hazard is no longer present in the workplace.

Substitution

Controlling exposures through the substitution method is completed by exchanging a less hazardous substance for the original one that was being used in a procedure. It must be noted that a less hazardous substance may have dangerous hazards as well.

Engineering Controls

Engineering controls create a barrier that isolates an individual from the hazard. Some common examples of engineering controls include chemical fume hoods, local exhaust ventilation systems, glove boxes, and guards on machinery.

Administrative Controls

Administrative controls modify the way a certain process is completed. Some of these modifications can include rotation schedules to lessen exposure times, policies and procedures to outline how the process should be completed safely, and operating procedures such as training and good housekeeping.

Personal Protective Equipment

Personal protective equipment (PPE) includes devices worn by an individual to protect them from a hazard, such as a chemical. Some of these devices include respirators, gloves, lab coats, and safety goggles. PPE should never be the only control method used in a facility to prevent possible exposures to individuals as PPE can fail with little or no warning.

Appendix A - Hierarchy of Control Methods