Chemical Exposure Monitoring Program
# Table of Contents

1. Introduction .................................................................................................................. 1  
Scope ................................................................................................................................ 1  
2. Exclusion ...................................................................................................................... 1  
3. Responsibilities .......................................................................................................... 1  
4. Procedures ................................................................................................................... 3  
5. Implementation of Controls ..................................................................................... 4  
6. Recordkeeping and Revision .................................................................................. 4  
7. Definitions .................................................................................................................. 5  

Appendix A – Hazard assessment form ........................................................................ 6
1. Introduction

This program is designed to regulate the effect of hazardous chemicals in East Carolina University. With over 650 research laboratories, many employees are engaged everyday handling various chemicals as part of their routine job demands. In addition to available controls, a chemical exposure monitoring is necessary to measure the effectiveness of these controls. This is to ensure that exposure, if any, are within regulatory limits established by the Occupational Safety and Health Administration (OSHA) in its 29 CFR 1910.1450 standard.

Scope

The implementation of this program is intended for employees of East Carolina University whose job require the use and handling of hazardous chemicals.

2. Exclusion

This program does not include asbestos, radiation, biological or noise exposures: which are included in the asbestos, radiation safety, biological safety and hearing conservation programs respectively. Chemical contaminants of interest include, but are not limited to, waste anesthetic gases (e.g. Isoflurane), formaldehyde, glutaraldehyde (Cidex), ethylene oxide and others listed in OSHA Z tables.

3. Responsibilities

a. Office of Environmental Health and Safety

i. Obtain, update and maintain a comprehensive laboratory chemical inventory provided by principal investigators and/or supervisors.

ii. Review supervisors/principal investigators’ chemical inventory and safety plans to ensure conformity with best practices.

iii. Conduct exposure assessment for new labs, or existing laboratories when there are significant changes. Assessment results shall be used to determine the need for periodic monitoring or termination.

iv. Conduct chemical exposure monitoring for both as required for compliance, accreditation and other purposes. All methods of conducting chemical exposure monitoring shall be based on those approved by OSHA as contained in the 29 CFR 1910.1450 Standard

v. Communicate results of chemical exposure monitoring to employee within 15 days of assessments.

vi. Successfully implement the contents of this program which include exposure assessment, laboratory safety plan review, recommendation of higher controls, coordination of training etc. to reduce employee exposures.

vii. Document and maintain database of chemical exposure monitoring assessment reports.
b. Principal Investigators/Supervisors

i. Maintain Chemical Hygiene Plan tailored towards potential hazards found in their respective labs. PI’s/supervisor’s should reference the EH&S Chemical Hygiene Plan to create a customize laboratory safety plans similar to those found at the EH&S Lab Safety Plan Library.

ii. Ensure laboratory users have received HAZCOM training before working in the laboratory. Only trained and qualified employees should be made to handle hazardous chemical.

iii. Document inventories of all laboratory chemicals and provide EH&S with same. All changes and updates of chemicals should also be reported for documentation.

iv. Report any suspected or potential chemical exposure agent to EH&S for follow up assessment, and/or chemical exposure monitoring.

v. Ensure Safety Data Sheets (SDS) of chemicals are accessible, post warning signs and labels on dangerous areas to warn of potential hazards. Laboratory safety plans should be clearly displayed to show chemical properties and safe handling procedures.

c. Office of Prospective Health

The Office of Prospective Health will:

i. Be responsible for monitoring biological and radioactive agents.

ii. Maintain database of biological and radioactive substances.

iii. Provide medical surveillance evaluation at no cost to employee.

d. Employees

i. Immediately report unusual signs or symptoms arising from working with new or existing chemical(s).

ii. Contact EH&S, where necessary, to report potential chemical exposure or suspected symptoms of overexposure.

iii. Strictly comply with standard operating procedures regarding the use and safe handling of hazardous chemicals.

iv. Contribute to the success of this program by participating in the chemical hygiene training programs, observing safe work practices, utilizing provided personal protective equipment etc.
4. Procedures

The Office of Environmental Health and Safety shall determine employee exposure in accordance with OSHA standard 29 CFR 1910.1450 (d). An initial or periodic monitoring shall be conducted depending on the type of hazardous chemical and the level of exposure in the environment.

a. Initial monitoring

i. Initial monitoring shall be performed as a baseline to determine the concentration of chemical substance. Initial monitoring will be conducted upon notification of possible exposure to hazardous chemicals in concentration that exceeds the action level or, in the absence of action level, the permissible exposure limits (PEL). Monitoring shall also be performed if results, based on routine exposure assessments, indicate exposure limits above regulatory standards. Supervisors/PIs can request monitoring by directly contacting the EH&S office or by completing the hazard assessment form in Appendix A and return to EH&S.

ii. The Permissible Exposure Limits for OSHA-regulated chemicals can be found at TABLE Z-1, TABLE Z-2 and TABLE Z-3 of the standard, or specifically on the labeled manufacturer’s Safety Data Sheet (SDS). Supervisors/PIs therefore must ensure that laboratory SDS materials reflect the complete chemical inventory available.

iii. Chemical Exposure Monitoring for compliance with OSHA or other regulatory agencies will be funded by the EH&S Office. This shall also apply if there are equipment changes or increase in volume of chemical usage, modification of controls, change of work procedures or practices, or as recommended by EH&S. However, monitoring requests based on accreditation and other related purposes will be the responsibility of the department.

iv. Initial monitoring results shall be made available to employee within 15 days of assessments. Explanation of results to employee may be provided at no cost.

v. The Office shall maintain a database of initial monitoring conducted and use same as baseline assessment for any other secondary monitoring at each respective locations. If the initial monitoring results indicate an exposure level at or above OSHA PEL or action level, periodic monitoring shall be performed.

b. Periodic monitoring

i. Periodic monitoring will be conducted when an initial monitoring indicates that employee exposures is at or above the action level or permissible exposure limit. This shall also be conducted if required for accreditation purposes.

ii. The rate of periodic monitoring will vary depending on the type of chemical and frequency of use. OSHA recommends that periodic monitoring be sustained if employee exposures are routinely above the action level-while the necessary controls are being implemented.
Monitoring however may be terminated when employee exposures are below the action level.

iii. Periodic monitoring like initial monitoring shall be based on methods approved by OSHA.

**c. Termination of monitoring**

i. Chemical Exposure Monitoring shall be terminated if initial monitoring results is below the action level. Also, if two consecutive periodic monitoring or measurements reveal that chemical concentration has reduced below the action level.

ii. A fresh monitoring will however be necessary if any one of the following conditions occurs: *equipment changes or increase in volume of chemical usage, modification of controls, change of work procedures or practices or as recommended by the EH&S office.*

iii. Monitoring requests based on laboratory recertification, laboratory annual exposure assessments for accreditation purposes will also be conducted accordingly.

**5. Implementation of Controls**

To minimize the concentration of hazardous chemicals, EH&S will ensure that controls currently in place are effective, and will continue to explore and recommend more effective controls for employee protection. Priority of implementing controls shall be according to standard hierarchy of controls which are elimination, substitution, engineering, administrative and the use of personal protective equipment.

**6. Recordkeeping and Revision**

All chemical exposure monitoring assessments shall be maintained in an active database by the EH&S. Assessment reports shall constitute a baseline for reassessing a particular lab or location. The Office of Prospective Health shall maintain medical examination results including tests or written opinion for each employee as required by the standard. Supervisors/PIs may also have access to laboratory assessment reports by contacting EH&S.

This program shall be updated as necessary to reflect current changes in regulations, standards and guidelines as recommended by OSHA, NIOSH and other approved agencies.
7. Definitions

**Action Level:** A concentration designated in 29 CFR part 1910 for a specific substance, calculated as an eight (8) hour time weighted-average, which initiates certain required activities such as exposure monitoring and medical surveillance.

**Chemical Hygiene Plan:** A written program developed and implemented 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.

**HAZCOM:** Hazard Communication is a standard by OSHA designed to protect employees who work with hazardous chemicals. The Right-to-know standard requires that every employee that work with hazardous chemicals be trained on proper handling and use of these chemicals.

**OSHA:** Occupational Safety and Health Administration, a federal organization (part of the Department of Labor) that ensures safe and healthy working conditions for Americans by enforcing standards and providing workplace safety training.

**Permissible Exposure Limits (PEL):** Means the regulatory limit on the amount or concentration of a chemical that a worker may be exposed to, which is usually based on an eight-hour time weighted average.

**Safety Data Sheet (SDS):** Document provided by a chemical manufacturer that contains information on potential hazards (health, fire, reactivity and environmental) associated with a chemical product, and to safely work with the product.

**Time Weighted Average (TWA):** The average exposure within the workplace to any hazardous chemical contaminant or agent using the baseline of an 8-hour work day or 40-hours work week.
## Appendix A

### Hazard Assessment Form

<table>
<thead>
<tr>
<th>Contact Name</th>
<th>Date</th>
</tr>
</thead>
<tbody>
<tr>
<td>Department</td>
<td></td>
</tr>
<tr>
<td>Location/Address</td>
<td></td>
</tr>
<tr>
<td>Email</td>
<td>Phone</td>
</tr>
</tbody>
</table>

**Job Task(s)**
1. 
2. 

**Frequency of task**

<table>
<thead>
<tr>
<th>Daily</th>
<th>Weekly</th>
<th>Monthly</th>
<th>Emergency only</th>
<th>Other (Please specify)</th>
</tr>
</thead>
<tbody>
<tr>
<td>☐</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
<td></td>
</tr>
</tbody>
</table>

Please list potential hazards associated with this task (physical, mechanical, ergonomic):
1. 
2. 
3. 

Please list potential health hazards associated with this task (list products and materials):
1. 
2. 
3. 

Please list types of contaminants or hazards:

<table>
<thead>
<tr>
<th>Particulate contaminants (e.g dust, fumes, mist etc)</th>
<th>Chemical contaminants (e.g aerosols, gas, liquid, vapor etc)</th>
<th>Biological contaminants (e.g molds, fungi, bacteria, bloodborne pathogens etc)</th>
<th>Physical risk (e.g noise, temperature)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>1.</td>
<td>1.</td>
<td>1.</td>
</tr>
<tr>
<td>2.</td>
<td>2.</td>
<td>2.</td>
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<tr>
<td>3.</td>
<td>3.</td>
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</tr>
<tr>
<td>4.</td>
<td>4.</td>
<td>4.</td>
<td>4.</td>
</tr>
</tbody>
</table>

Oxygen deficient or rich atmosphere?
- **Deficient**: less than 19% of air
- **Rich**: above 22% of air

<table>
<thead>
<tr>
<th>Yes</th>
<th>No</th>
<th>Varies</th>
<th>Don't know</th>
</tr>
</thead>
<tbody>
<tr>
<td>☐</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

What engineering controls are in place?
1. 

---

6
What other engineering controls could be added to reduce exposure?
1. 
2. 
3. 

What personal protective equipment are currently being used?
1. 
2. 
3. 

What other personal protective equipment is required for this task?
1. 
2. 
3. 

Recommendations

Comments

EH&S Use

<table>
<thead>
<tr>
<th>Contaminants</th>
<th>Vapor</th>
<th>Physical</th>
<th>Radioactive</th>
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</thead>
<tbody>
<tr>
<td>Gas</td>
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<tr>
<td>Mist</td>
<td>Dust</td>
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<tr>
<td>Fumes</td>
<td>Other Particulates</td>
<td>Chemical</td>
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<tr>
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<td>TLV:</td>
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<tr>
<td>IDLH:</td>
<td></td>
<td></td>
<td></td>
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</tbody>
</table>

Recommendations:

Name:
Signature: