Lead Management Program
(EHS Program Manual 7.6)

1.0 Overview

Environmental Health and Safety (EHS) at Weill Cornell Medicine (WCM) has developed this Lead Management Program to outline the types of lead-dust generating activities that may occur at the College, the applicable methods for protection, and the responsibilities of the different personnel involved.

This manual is written in keeping with the Occupational Safety and Health Administration (OSHA) Lead Standard 29 CFR 1910.1025.

2.0 Table of Contents

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3.0 Objective

This manual outlines the procedures that WCM Supervisors and Employees must follow in order to minimize exposures to lead and to perform the most common types of lead work in a manner that protects their health and safety, as well as the health of WCM students, staff, the public, and the environment.

4.0 Applicability

This program applies to all WCM employees who may have occupational exposure to airborne lead dust and/or fumes, and employees who plan, design, or supervise work that may generate lead dust or result in lead contamination, including those who use or handle lead in radiation shielding. Contractors who work on WCM property or on behalf of WCM are also required to abide by the requirements of this program.

This program does not apply to Child-Occupied Facilities, which are covered under the New York City Childhood Lead Poisoning Prevention Act of 2004.

The use of lead and lead compounds in laboratory experiments is covered by EHS Program Manual 4.1 – Laboratory Chemical Hygiene Plan.

5.0 Responsibilities

5.1 ENVIRONMENTAL HEALTH AND SAFETY (EHS)

EHS duties include:

- Serve as technical resource for WCM employees.
- Determine the presence of lead in the work environment.
- Perform exposure monitoring for employees exposed to lead.
- Conduct Personal Protective Equipment (PPE) assessments for employees with potential lead exposure.
- Review and approve proposed lead abatement procedures.
- Provide training for WCM employees with occupational lead exposure.
- Manage, review, and update the Lead Protection Program.

5.2 ENGINEERING AND MAINTENANCE (E&M)

E&M duties include:

- Notify EHS of work that may affect materials containing lead.
- Utilize all engineering, administrative, and Personal Protective Equipment (PPE) controls required under this program.
- Notify EHS if work will affect a material whose lead-containing status is unknown.
- Ensure that all employees who are identified as having a potential exposure to lead receive training, medical testing, and PPE as required by this program.

5.3 CAPITAL PLANNING

Capital Planning duties include:

- Identify and notify EHS of operations that may potentially generate lead dust when developing, reviewing, or assessing construction plans and/or activities.
- Ensure that all work is performed in a manner that does not result in overexposure of lead to WCM personnel or the public.
- Include language regarding the safe handling and disposal of lead and lead-contaminated materials in all applicable scopes of work and/or contract documents.
- Ensure that contractors who perform lead-related work on behalf of WCM receive a copy of this manual and adhere to the requirements within.

5.4 CONTRACTORS/ABATEMENT COMPANIES

Contractors and Abatement Companies must:

- Perform all work that disturbs materials listed in Section 6 as required by this manual, as well as all local, state, and federal regulations.
- Submit proposed Lead abatement procedures and containment procedures to EHS for review prior to beginning any lead dust-generating work.

5.5 SUPERVISORS

Supervisors' duties include:

- Assess work tasks before employee assignment to determine if there is a potential for lead exposure.
- Contact EHS for assistance where a definitive assessment of the potential for lead exposure is not possible.
- Ensure that employees assigned to perform lead work receive training, medical testing, and PPE as stated in this program.
- Ensure the implementation and use of engineering and/or administrative controls.

5.6 EMPLOYEES

Employees must:

- Perform all assigned work in a manner consistent with this manual.
- Utilize engineering, administrative, and PPE controls required for the job.
- Notify immediate supervisor or EHS of previously unidentified lead-generating activities.
- Practice good housekeeping and personal hygiene controls to reduce or eliminate the spreading of lead dust contamination.

5.7 WORKFORCE HEALTH AND SAFETY (WHS)

Workforce Health and Safety duties include:

- Provide medical clearance for the use of respirators according to EHS Program Manual 7.1 – Respiratory Protection.
- Provide a program of biological monitoring and medical surveillance for all employees exposed to levels of inorganic lead above the action level of 30 µg/m3 (TWA) for more than 30 days per year, in compliance with 29 CFR 1910.1025.
- Coordinate with supervisors and EHS if an employee must be temporarily removed from work due to an elevated blood lead level, as detailed in paragraph (k) of 29 CFR 1910.1025. This procedure is known as medical removal.

6.0 Potential Lead Sources

Lead is a soft, heavy, and toxic metal. Environmental and occupational exposures to airborne lead can result in adverse short-term and long-term health effects. The primary routes of exposure to lead are the inhalation and/or ingestion of lead dust or fumes.

Examples of building material and other types of materials+- that may contain lead are:

- Interior and exterior paint applied prior to 1978.
- Lead piping.
- Radiation shielding.
- Steel and iron primer.
- Industrial paint.

- Industrial electrical jacketing.
- Roof flashing.
- Tank linings.
- Soft solder.
- Glazed ceramics.

7.0 Exposure Assessments

The Manager/Supervisor must review all work procedures to determine if there is any potential for lead exposure or contamination. In making this determination, the Manager/Supervisor needs to consider whether the materials may contain lead and, if so, whether the work activities involving those materials can potentially generate dust or fumes.

EHS will perform or coordinate exposure assessments of all employees who are identified as being potentially exposed to significant amounts of lead in order to determine their exposure levels. The evaluation will be performed at the start of all new projects, and when there are significant changes to the work process of existing activities that may affect employee exposure levels.

Exposure assessments will include some or all of the following techniques:

- Appraisal of work activities
- Review of work location
- Sampling of materials for lead content
- Personal exposure monitoring

A visual inspection of the area may prompt collection of samples to determine both the quantity of lead-based paint and the relative lead-based paint hazard that exists in a space.

When sampling is needed to determine whether lead is present in a particular material, dust, or tap water, the process will be performed by following the protocols set out by the U.S. Department of Housing and Urban Development (HUD) "Guidelines for the Evaluation and Control of Lead-Based Paint Hazards in Housing." Sampling will consist of collecting lead dust wipe samples, collecting samples of deteriorated paint chips, or utilizing an X-ray Fluorescence instrument (XRF). XRF is the preferred initial testing method because it is the least intrusive.

The HUD Guidelines also detail the number of sample points required in the evaluation, which is based on several variables, including the number of individual dwellings within a specific building. These guidelines must be followed when conducting the assessment.

Samples must be sent to a laboratory accredited by EPA National Lead Laboratory Accreditation Program (NLLAP).

Where personal exposure monitoring is determined to be necessary, it will be conducted according to the National Institute for Occupational Safety and Health (NIOSH) Manual of Analytical Methods and will be full-shift samples wherever possible. Exposure assessments are based on representative samples of employees who may be exposed to the greatest airborne concentrations of lead in the workplace. Additional monitoring will occur if there has been a change that may result in new or additional exposure to lead.

Employees or their designated representatives may observe any monitoring of employee exposure to lead if they request to do so. Employees or representatives observing a monitoring procedure must wear all protective clothing, including respirators, when required. Observers are entitled to receive an explanation of the measurement procedures, observe all steps related to the monitoring of lead performed at the place of exposure, and record or receive copies of results when returned by the laboratory.

8.0 Exposure Levels

OSHA has set a lead Permissible Exposure Level (PEL) of 50 micrograms per cubic meter of air ($\mu g/m^3$) calculated as an 8-hour Time Weighted Average (TWA). In addition, OSHA has set an Action Level (AL) of 30 $\mu g/m^3$ as an 8-hour TWA. **Employees exposed above the AL for more than 30 days in any calendar year must be included in the medical monitoring portion of this program.**

For the purposes of this program manual, exposures are those that would occur if the employee were not utilizing respiratory protection.

In order to assure that employees receive the appropriate protection required for the type of work they perform, the following actions must be followed based on an employee's actual or anticipated exposure level:

8.1 EXPOSURE BELOW THE ACTION LEVEL (AL)

Any employee who may be exposed to airborne lead, when said exposure is below the AL, must receive a copy of "OSHA Substance Data Sheet for Occupational Exposure to Lead" and "OSHA Employee Standard Summary", as found on the OSHA website.

EHS will maintain a written record of monitoring results indicating this result.

8.2 EXPOSURE ABOVE THE ACTION LEVEL (AL)

All employees identified as being exposed above the AL, or for whom the possibility of skin or eye irritation exists, must receive training prior to initial job assignment.

No employee shall be exposed to lead above the AL for more than 30 days per year without being included in a medical monitoring program that complies with the OSHA lead standard 29 CFR 1910.1025, as well as an EHS-approved Lead Work Program.

If monitoring reveals exposures above the AL, it will be repeated at a minimum every six months until at least two consecutive measurements, taken at least seven days apart, are below the AL.

8.3 EXPOSURE ABOVE THE PERMISSIBLE EXPOSURE LEVEL (PEL)

As of the publication of this manual, no tasks at WCM have been identified that routinely expose employees to concentrations of lead above the PEL.

If a task is identified that exposes staff above the PEL and it can be demonstrated that engineering and administrative controls are not effective in reducing an employee's exposure to below the PEL, an Exposure Control Program (ECP) specific to the work being performed must be developed and implemented prior to the start of work. The ECP must provision for each of the controls mandated by the OSHA lead standard, and must be approved by the Director of EHS. Where engineering and administrative controls are not sufficient in reducing exposures to below the PEL, they must still be utilized to minimize exposures to as low a level as possible.

If monitoring reveals exposures above the PEL, it will be repeated at a minimum quarterly until at least two consecutive measurements, taken at least seven days apart, are below the PEL.

8.4 EMPLOYEE NOTIFICATION

EHS must notify affected employees of monitoring results within 15 days of receipt. Notification can be provided either individually in writing or by posting the results in an appropriate location accessible to affected employees.

If exposure monitoring indicates an exceedance of the PEL, EHS will determine the corrective actions that have been taken or will be taken to reduce exposure to or below the PEL. Employees will be notified of the corrective actions in writing.

9.0 Exposure Controls

When employee exposures are found to exceed the PEL, WCM must implement engineering and work practice controls to reduce lead exposure.

9.1 ENGINEERING CONTROLS

Engineering controls must be the primary means of reducing employee exposures below the PEL.

Examples of engineering controls include:

- Ventilation.
- Encapsulation.
- Air filtration.
- Source capture.
- Chemical peels and strippers.
- Wet methods

9.2 ADMINISTRATIVE CONTROLS

If it is determined that engineering controls alone are not sufficient to reduce exposures below the PEL, a program to reduce the exposure through Administrative Controls must be implemented in addition to the engineering controls.

Administrative Controls may include:

- Job rotation schedule.
- Reduced work shifts.
- Restricted work site access.

9.3 PERSONAL PROTECTIVE EQUIPMENT (PPE)

Where employees are exposed above the PEL, or at the employee's request, the employer must provide and assure the use of respirators in compliance with the EHS Program Manual 7.1 – Respiratory Protection. Respirators should provide sufficient protection so that employees' actual exposures to lead are below the PEL when the protection provided by the respirator (also known as Assigned Protection Factor) is taken into account.

Employees must also receive sufficient PPE to prevent skin or eye irritation and gross contamination of street clothes.

EHS will be responsible for completing a PPE assessment for any employee exposed above the AL.

10.0 Classification of Lead Generating Work

Because lead does not biodegrade, any amount of lead released into the workplace becomes a source of environmental contamination. Lead released in significant concentrations may result in adverse health effects to employees or other susceptible individuals. Therefore, all lead work must be performed in a manner consistent with this program.

Lead work will be classified as one of three types based on the exposure potential of the work. The exposure potential is the combined effect of the amount of lead dust or fumes that a type of work may create, combined with the duration of the work. The levels range from Level 1 (lowest) to Level 3 (highest).

Examples of engineering controls and work practices that can help contain or reduce the amount of lead dust are included in each section. Employees must consider all available methods and implement the necessary controls to reduce contamination to the lowest reasonably achievable level. Any employee who is uncertain of the proper classification for a given assignment must notify EHS for assistance in making the determination.

10.1 LEVEL 1

Level 1 work has the potential to generate negligible amounts of lead dust fumes or debris. This level of work is not expected to result in exposures above the Action Level.

Such work includes but is not limited to the following work activities:

- Drilling small holes in building materials.
- Hanging or removing objects from walls, ceilings, or floors.
- Minor disturbances, such as cutting or scraping of building materials with less than 1 square foot total surface area.
- Plumbing or electrical activities, such as lead joint work on cast iron soil pipes or cable splicing.
- Wet wiping or mopping of areas contaminated with lead dust.

10.1.1 Control Procedures

- Use vacuums with a HEPA filter to capture lead dust at the source or to clean contaminated surfaces.
- Use drop cloths to capture debris and plastic sheeting to contain dust.
- Do not dry-sweep dust possibly contaminated with lead; use either a wet mop/rag or HEPA vacuum.
- Utilize good personal hygiene practices, including keeping the work area clean, no smoking, eating or drinking in the work area and washing your hands after handling any lead materials.
- Use disposable gloves and eye protection where appropriate.

10.2 LEVEL 2

Level 2 work is likely to generate moderate amounts of lead and may result in lead exposures over the Action Level, but the scope of work is of limited size and/or duration, such that exposures can be controlled through common engineering controls.

Examples of Level 2 work include:

- Sawing, sanding, scraping, or otherwise disturbing building materials known or assumed to be coated with lead-based paint with a total surface area between 1 and 10 square feet.
- Hot Work such as burning, cutting, or welding metals coated with lead-based paint and sweeping or otherwise disturbing dust that contains lead.
- Removing or replacing window and doorframes.
- The handling, removal, or installation of bulk lead metal for radiation shielding.

10.2.1 Control Procedures

- Use vacuums with HEPA filters to capture lead dust at the source or to clean contaminated surfaces.
- Contain the work area to prevent the spread of lead.
- Limit access to work areas to employees engaged in lead work only.
- Remove lead-based paint from work surfaces by means other than heating or scraping (e.g., Chemical peels or strippers).
- Use PPE such as respirators or disposable gloves and suits.

10.3 LEVEL 3

Level 3 work has the potential to generate significant amounts of lead dust or fumes.

Examples of level 3 work include:

- Sawing, sanding, scraping, or otherwise disturbing building materials known or assumed to be coated with lead-based paint with a total surface area greater than 10 square feet.
- Extended Hot Work such as burning, cutting, or welding metals containing lead or coated with lead-based paint.
- Removing or replacing multiple windows and/or doorframes.
- Demolition of building material coated with lead-based paint.

10.3.1 Control Procedures

Prior to beginning any level 3 lead work by employees, management must submit a lead work plan to EHS for approval. The lead work plan must include a description of the type of work to be performed and the controls to be utilized. The plan must employ all practical control measures necessary to reduce employee exposures to the lowest level possible.

No employee shall be exposed to lead above the AL for more than 30 days per year without being included in a medical monitoring program that complies with the OSHA lead standard 29 CFR 1910.1025. If monitoring results indicate that exposures are above the PEL, appropriate change rooms, hand washing stations, and showers will be provided for employees performing this work.

If the PEL is to be exceeded, a sign stating, “DANGER; LEAD; MAY DAMAGE FERTILITY OR THE UNBORN CHILD; CAUSES DAMAGE TO THE CENTRAL NERVOUS SYSTEM; DO NOT EAT, DRINK, OR SMOKE IN THIS AREA” will be posted at the entrance to the work area.

11.0 Waste Disposal

Several Federal, State, and Local regulations control the handling, storage, labeling, and disposal of hazardous waste. Generators must determine if waste streams that include lead-contaminated materials, such as paint chips or building materials coated with lead paint, need testing to determine if the waste is regulated. Examples of these waste streams are waste from abatement activities, construction, and demolitions. This consideration should include all parts of the waste stream, not just those involving lead-containing materials (e.g., paint).

Employees should contact EHS for assistance in determining what waste is regulated. Specific information regarding shipping procedures and documentation is detailed in EHS Program Manual 5.2.

The following sections describe the criteria to be followed when handling waste.

11.1 SCRAP LEAD

The disposal and/or recycling procedures for scrap lead are outlined in Section 10.18 of EHS Program Manual 5.2 – Waste Disposal Procedures. Scrap lead that is recycled is exempt from testing under the Scrap Metal Exemption presented under 6NYCRR Part 371.1(c) (7).87.

11.2 LEAD WASTE

The EHS Program Manual 5.2 – Waste Disposal Procedures details how lead waste generated from WCM work activities must be collected and stored. Examples of wastes include paint chips, contaminated equipment such as Personal Protective Equipment (PPE), tools, tarps, or other materials that cannot be adequately decontaminated. EHS will determine the classification of the waste and arrange for disposal at no cost.

11.3 WHOLE BUILDING DEMOLITION

Every effort must be made to remove all hazardous materials from buildings before demolition (e.g., mercury-containing light bulbs or asbestos-containing materials). Subsequently, all other debris resulting from large-scale or whole-building demolitions should be treated as a single waste stream.

Typically, if the only remaining source of lead in this waste stream were lead-based paint on building materials, debris from this type of activity would not be classified as hazardous waste when subjected to laboratory analysis, due to the relatively small ratio of lead to all other building materials. Such materials can potentially be disposed of as construction and demolition waste.

12.0 Training

12.1 EMPLOYEES PERFORMING LEVEL 1 WORK

Any employee with potential exposure to airborne lead must receive a copy of "OSHA Substance Data Sheet for Occupational Exposure to Lead" and "OSHA Employee Standard Summary", as found on the OSHA website.

12.2 EMPLOYEES PERFORMING LEVEL 2 WORK

Employees who are or could become exposed to lead at or above the AL must receive Lead Awareness Training before working with lead and annually thereafter as part of the employee's annual Right-to-Know instruction.

This training will include information regarding:

- Requirements of the OSHA standard.
- Specific hazards associated with the employee's work environment.
- Proper use of PPE, including respiratory protection.
- Purpose and descriptions of the medical surveillance program and medical removal program.
- Protective measures that can be taken.
- The danger of lead to their bodies (including their reproductive systems).
- Employee rights under the OSHA standard.

13.0 Record Retention, Availability, and Revisions

All records will be maintained as required by the Occupational Safety & Health Administration (OSHA) lead standard 29 CFR 1910.1025, as described in the following sections.

13.1 EXPOSURE MONITORING RECORDS

EHS will maintain Exposure monitoring records and results for each employee for a period of 40 years or for the duration of employment plus 20 years, whichever is longer.

Exposure monitoring records must include:

1. The date(s), number, duration, location, and results of each of the samples taken, including a description of the sampling procedure used to determine representative employee exposure where applicable.
2. A description of the sampling and analytical methods used and evidence of their accuracy.
3. The type of respiratory protective devices worn, if any.
4. Name, CWID, and job classification of the employee monitored and all other employees whose exposure the measurement is intended to represent.
5. The environmental variables that could affect the measurement of employee exposure.

13.2 TRAINING RECORDS

EHS will maintain all training records for at least 3 years after the training date. The training records shall include the dates of the training sessions, a summary of the material covered in the training sessions, names and qualifications of the trainer(s), and names and job titles of the attendees.

13.3 MEDICAL SURVEILLANCE RECORDS

NewYork-Presbyterian Hospital Workforce Health and Safety will maintain medical records of WCM faculty and staff. The records will document the monitored employee's job description and all results of exposure monitoring, medical examinations, employee medical complaints, and tests performed in compliance with 29 CFR 1910.1025. Copies of healthcare professionals' written opinions and employee complaints regarding lead exposure incidents will also be kept in the medical record.

Medical records will be kept confidential and disclosed only with the employee's written permission, except as required by 29 CFR 1910.105 or by law. Medical records shall be maintained for at least 40 years or the duration of employment plus 20 years, whichever is longer.

NewYork-Presbyterian Hospital Workforce Health and Safety will also maintain medical removal records for WCM faculty and staff, if applicable. The records will contain the name and CWID of the employee, the date of removal and the corresponding date the employee returned to work, and a brief explanation of how and why the removal occurred, as required by 29 CFR 1910.1025. Medical removal records will be maintained for at least the duration of the affected employee's employment.

14.0 Definitions

- **HEPA (High-Efficiency Particle Air) Filter:** Filters rated to remove at least 99.97% of airborne particles 0.3 micrometers (μm) in diameter.
- **Lead:** "Lead" means metallic lead, all inorganic lead compounds, and organic lead soaps. Excluded from this definition are all other organic lead compounds.
- **Lead-Based Paint:** Paint that contains 0.5% or more lead.
- **Lead Work:** Work that generates lead dust or fumes.
- **Medical Removal:** The process of removing employees from work when they are exposed to lead due to elevated lead levels found in the blood during routine medical surveillance, as specified in 29 CFR 1910.1025 Appendix C.

15.0 References

- Occupational Safety & Health Administration (OSHA) lead standard 29 CFR 1910.1025 https://www.osha.gov/laws-regs/regulations/standardnumber/1910/1910.1025
- The New York City Childhood Lead Poisoning Prevention Act of 2004 https://www1.nyc.gov/site/doh/health/health-topics/lead-poisoning-information-for-building-owners.page
- Environmental Protection Agency (EPA) 40 CFR Part 745 Lead; Identification of Dangerous Levels of Lead https://www.govinfo.gov/content/pkg/FR-2001-01-05/pdf/01-84.pdf
- U.S. Department of Housing and Urban Development "Guidelines for the Evaluation and Control of Lead-Based Paint Hazards in Housing" https://www.hud.gov/sites/documents/SECOND_EDITION_2012.PDF