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.

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3.0 Objective
This manual outlines the procedures that WCM Supervisors and Employees must follow in order 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 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 2003.

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 obligations 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.
- 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 responsibilities include:
- Identify and notify EHS of potential lead-generating activities 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 to EHS for review prior to beginning any lead dust-generating work.

5.5 SUPERVISORS
Supervisors are required to:
- 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 responsibilities 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 that may contain lead are:
- Interior and exterior paint applied prior to 1978.
- Lead piping.
- Radiation shielding.
- Steel and iron primer.
- Industrial paint.
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- 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
- A sampling of materials for lead content
- Personal exposure monitoring

A visual inspection of the area may prompt the collection of samples to determine both the quality 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 (µg/m3) calculated as an 8-hour Time Weighted Average (TWA). In addition, OSHA has set an Action Level (AL) of 30 µg/m3 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 have exposure to lead, when said exposure is below the AL, shall receive a copy of Appendix A – OSHA Substance Data Sheet for Occupational Exposure to Lead and Appendix B – OSHA Employee Standard Summary.

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.

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 work 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 also 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.
CONTINUED: Lead Management Program

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 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.
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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 like 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 Appendix A and Appendix B, noted at the end of this program manual.

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, social security number, 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 social security number 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

- 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](https://www.govinfo.gov/content/pkg/FR-2001-01-05/pdf/01-84.pdf)
Appendix A – OSHA Substance Data Sheet for Occupational Exposure to Lead


Substance data sheet for occupational exposure to lead - 1910.1025 App A

I. SUBSTANCE IDENTIFICATION

A. Substance: Pure lead (Pb) is a heavy metal at room temperature and pressure and is a basic chemical element. It can combine with various other substances to form numerous lead compounds.

B. Compounds Covered by the Standard: The word “lead” when used in this standard means elemental lead, all inorganic lead compounds and a class of organic lead compounds called lead soaps. This standard does not apply to other organic lead compounds.

C. Uses: Exposure to lead occurs in at least 120 different occupations, including primary and secondary lead melting, lead storage battery manufacturing, lead pigment manufacturing, and use, solder manufacturing and use, shipbuilding and ship repairing, auto manufacturing, and printing.

D. Permissible Exposure Limit (PEL): The standard established a 50 micrograms of lead per cubic meter of air (30 ug/m³), averaged over an 8-hour workday.

E. Action Level: The standard establishes an action level of 30 micrograms per cubic meter of air (30 ug/m³), time weighted average, based on an 8-hour workday. The action level initiates several requirements of the standard, such as exposure monitoring, medical surveillance, and training and education.

II. HEALTH HAZARD DATA

A. Ways in which lead enters your body: When absorbed into your body in certain doses, lead is a toxic substance. The object of the lead standard is to prevent absorption of harmful quantities of lead. The standard is intended to protect you not only from the immediate toxic effects of lead, but also from the serious toxic effects that may not become apparent until years of exposure have passed.

Lead can be absorbed into your body by inhalation (breathing) and ingestion (eating). Lead (except for certain organic lead compounds not covered by the standard, such as tetraethyl lead) is not absorbed through your skin. When lead is scattered in the air as a dust, fume, or mist it can be inhaled and absorbed through your lungs and upper respiratory tract. Inhalation of airborne lead is generally the most important source of occupational lead absorption. You can also absorb lead through your digestive system if lead gets into your mouth and is swallowed. If you handle food, cigarettes, chewing tobacco, or make-up which have lead on them or handle them with hands contaminated with lead, this will contribute to ingestion.

A significant portion of the lead that you inhale or ingest gets into your bloodstream. Once in your bloodstream, lead is circulated throughout your body and stored in various organs and body tissues. Some of this lead is quickly filtered out of your body and excreted, but some remains in the blood and other tissues. As exposure to lead continues, the amount stored in your body will increase if you are absorbing more lead than your body is excreting. Even though you may not be aware of any immediate symptoms of disease, this lead stored in your tissues can be slowly causing irreversible damage, first to individual cells, then to your organs and whole body systems.

B. Effects of overexposure to lead - (1) Short-term (acute) overexposure. Lead is a potent, systemic poison that serves no known useful function once absorbed by your body. Taken in large enough doses, lead can kill you in a matter of days. A condition affecting the brain called acute encephalopathy may arise which develops quickly to seizures, coma, and death from cardiorespiratory arrest. A short-term dose of lead can lead to acute encephalopathy. Short term occupational exposures of this magnitude are highly unusual, but not impossibly. Similar forms of encephalopathy may, however, arise from extended, chronic exposure to lower doses of lead. There is no sharp dividing line between rapidly developing acute effects of lead, and chronic effects which take longer to acquire. Lead adversely affects numerous body systems, and causes forms of health impairment and disease which arise after periods of exposure as short as days or as long as several years.

(2) Long-term (chronic) overexposure. Chronic overexposure to lead may result in severe damage to your blood-forming, nervous, urinary and reproductive systems. Some common symptoms of chronic overexposure include loss of appetite, metallic taste in the mouth, anxiety, constipation, nausea, pallor, excessive tiredness, weakness, insomnia, headache, nervous irritability, muscle and joint pain or soreness, fine tremors, numbness, dizziness, hyperactivity and colic. In lead colic there may be severe abdominal pain.

Damage to the central nervous system in general and the brain (encephalopathy) in particular is one of the most severe forms of lead poisoning. The most severe, often fatal, form of encephalopathy may be preceded by vomiting, a feeling of dullness progressing to drowsiness and stupor, poor memory, restlessness, irritability, tremor, and convulsions. It may arise suddenly with the onset of seizures, followed by coma, and death. There is a tendency for muscular weakness to develop at the same time. This weakness may progress to paralysis often observed as a characteristic "wrist drop" or "foot drop" and is a manifestation of a disease to the nervous system called peripheral neuropathy.

Chronic overexposure to lead also results in kidney disease with few, if any, symptoms appearing until extensive and most likely permanent kidney damage has occurred. Routine laboratory tests reveal the presence of this kidney disease only after about two-thirds of kidney function is lost. When overt symptoms of urinary dysfunction arise, it is often too late to correct or prevent worsening conditions, and progression to kidney dialysis or death is possible.

Chronic overexposure to lead impairs the reproductive systems of both men and women. Overexposure to lead may result in decreased sex drive, impotence and sterility in men. Lead can alter the structure of sperm cells raising the risk of birth defects. There is evidence of miscarriage and stillbirth in women whose husbands were exposed to lead or who were exposed to lead themselves. Lead exposure also may result in decreased fertility, and abnormal menstrual cycles in women. The course of pregnancy may be adversely affected by exposure to lead since lead crosses the placental barrier and poses risks to developing fetuses. Children born of parents either one of whom were exposed to excess lead levels are more likely to have birth defects, mental retardation, behavioral disorders or die during the first year of childhood.

Overexposure to lead also disrupts the blood-forming system resulting in decreased hemoglobin (the substance in the blood that carries oxygen to the cells) and ultimately anemia. Anemia is characterized by weakness, pallor and fatigue as a result of decreased

CONTINUED: Lead Management Program

Substance data sheet for occupational exposure to lead - 1910.1025 App A

(3) Health protection goals of the standard. Prevention of adverse health effects for most workers from exposure to lead throughout a working lifetime requires that worker blood lead (PbB) levels be maintained at or below forty micrograms per one hundred grams of whole blood (40 ug/100g). The blood lead levels of workers (both male and female workers) who intend to have children should be maintained below 30 ug/100g to minimize adverse reproductive health effects to the parents and to the developing fetus.

The measurement of your blood lead level is the most useful indicator of the amount of lead being absorbed by your body. Blood lead levels (PbB) are most often reported in units of milligrams (mg) or micrograms (ug) of lead (1 mg=1000 ug) per 100 grams (100g), 100 milliliters (100 ml) or deciliter (dl) of blood. These three units are essentially the same. Sometimes PbBs are expressed in the form of mg% or ug%. This is a shorthand notation for 100g, 100 ml, or dl.

PbB measurements show the amount of lead circulating in your blood stream, but do not give any information about the amount of lead stored in your various tissues. PbB measurements merely show current absorption of lead, not the effect that lead is having on your body or the effects that past lead exposure may have already caused. Past research into lead-related diseases, however, has focused heavily on associations between PbBs and various diseases. As a result, your PbB is an important indicator of the likelihood that you will gradually acquire a lead-related health impairment or disease.

Once your blood lead level climbs above 40 ug/100g, your risk of disease increases. There is a wide variability of individual response to lead, thus it is difficult to say that a particular PbB in a given person will cause a particular effect. Studies have associated fatal encephalopathy with PbBs as low as 150 ug/100g. Other studies have shown other forms of diseases in some workers with PbBs well below 80 ug/100g. Your PbB is a crucial indicator of the risks to your health, but one other factor is also extremely important. This factor is the length of time you have had elevated PbBs. The longer you have an elevated PbB, the greater the risk that large quantities of lead are being gradually stored in your organs and tissues (body burden). The greater your overall body burden, the greater the chances of substantial permanent damage.

The best way to prevent all forms of lead-related impairments and diseases both short term and long term is to maintain your PbB below 40 ug/100g. The provisions of the standard are designed with this end in mind. Your employer has prime responsibility to assure that the provisions of the standard are complied with both by the company and by individual workers. You as a worker, however, have a responsibility to assist your employer in complying with the standard. You can play a key role in protecting your own health by learning about the lead hazards and their control, learning what the standard requires, following the standard where it governs your own actions, and seeing that your employer complies with provisions governing his actions.

(4) Reporting signs and symptoms of health problems. You should immediately notify your employer if you develop signs or symptoms associated with lead poisoning or if you desire medical advice concerning the effects of current or past exposure to lead on your ability to have a healthy child. You should also notify your employer if you have difficulty breathing during a respirator fit test or while wearing a respirator. In each of these cases your employer must make available to you appropriate medical examinations or consultations. These must be provided at no cost to you and at a reasonable time and place.

The standard contains a procedure whereby you can obtain a second opinion by a physician of your choice if the employer selected the initial physician.

[56 FR 24686, May 31, 1991]

Appendix B – OSHA Employee Standard Summary – 1910.1025


Employee standard summary - 1910.1025 App B

U.S. Department of Labor
Occupational Safety & Health Administration

www.osha.gov

Regulations (Standards - 29 CFR)
Employee standard summary - 1910.1025 App B

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This appendix summarizes key provisions of the standard that you as a worker should become familiar with.

I. PERMISSIBLE EXPOSURE LIMIT (PEL) – PARAGRAPH (C)

The standards set a permissible exposure limit (PEL) of fifty micrograms of lead per cubic meter of air (50 ug/m³), averaged over a 8-hour work-day. This is the highest level of lead in air to which you may be permittedly exposed over an 8-hour workday. Since it is an 8-hour average it permits short exposures above the PEL so long as for each 8-hour workday your average exposure does not exceed the PEL.

This standard recognizes that your daily exposure to lead can extend beyond a typical 8-hour workday as the result of overtime or other alterations in your work schedule. To deal with this, the standard contains a formula which reduces your permissible exposure when you are exposed more than 8 hours. For example, if you are exposed to lead for 10 hours a day, the maximum permitted average exposure would be 40 ug/m³.

II. EXPOSURE MONITORING – PARAGRAPH (D)

If lead is present in the workplace where you work in any quantity, your employer is required to make an initial determination of whether the action level is exceeded for any employee. This initial determination must include instrument monitoring of the air for the presence of lead and must cover the exposure of a representative number of employees who are reasonably believed to have the highest exposure levels. If your employer has conducted appropriate air sampling for lead in the past year he may use these results. If there have been any employees complaints or symptoms which may be attributable to exposure to lead or if there is any other information or observations which would indicate employee exposure to lead, this must also be considered as part of the initial determination.

The initial determination must have been completed by March 31, 1979. If this initial determination shows that a reasonable possibility exists that any employee may be exposed, without regard to respirators, over the action level (50 ug/m³) your employer must set up an air monitoring program to determine the exposure level of every employee exposed to lead at your workplace.

In carrying out this air monitoring program, your employer is not required to monitor the exposure of every employee, but he must monitor a representative number of employees and job class. Enough sampling must be done to enable each employee’s exposure level to be reasonably represented by at least one full-shift (at least 7 hours) air sample. In addition, these air samples must be taken under conditions which represent each employee’s regular, daily exposure to lead. All initial exposure monitoring must have been completed by May 30, 1979.

If you are exposed to lead and air sampling is performed, your employer is required to notify you in writing of air monitoring results which represent your exposure. If the results indicate your exposure exceeds the PEL (without regard to use of respirators),
then your employer must also notify you of this in writing, and provide you with a
description of the corrective action that will be taken to reduce your exposure.

Your exposure must be rechecked by monitoring every six months if your exposure is over
the action level but below the PEL. Air monitoring must be repeated every 3 months if you
are exposed over the PEL. Your employer may discontinue monitoring for you if 2
consecutive measurements, taken at least two weeks apart, are below the action level.
However, whenever there is a production, process, control, or personnel change at your
workplace which may result in new or additional exposure to lead, or whenever there is any
other reason to suspect a change which may result in new or additional exposure to lead,
your employer must perform additional monitoring.

III. METHODS OF COMPLIANCE - PARAGRAPH (E)

Your employer is required to assure that no employee is exposed to lead in excess of the
PEL. The standard establishes a priority of methods to be used to meet the PEL.

IV. RESPIRATORY PROTECTION - PARAGRAPH (F)

Your employer is required to provide and assure your use of respirators when your exposure
to lead is not controlled below the PEL by other means. The employer must pay the cost of
the respirator. Whenever you request one, your employer is also required to provide you a
respirator even if your air exposure level does not exceed the PEL. You might desire a
respirator when, for example, you have received medical advice that your lead absorption
should be decreased. Or, you may intend to have children in the near future, and want to
reduce the level of lead in your body to minimize adverse reproductive effects. While
respirators are the least satisfactory means of controlling your exposure, they are capable of
providing significant protection if properly chosen, fitted, worn, cleaned, maintained, and
replaced when they stop providing adequate protection.

Your employer is required to select respirators from the seven types listed in Table II of the
Respiratory Protection section of the standard (Sec. 1910.1025(f)). Any respirator chosen
must be approved by the National Institute for Occupational Safety and Health (NIOSH)
under the provisions of 42 CFR part 84. This respirator selection table will enable your
employer to choose a type of respirator that will give you a proper amount of protection
based on your airborne lead exposure. Your employer may select a type of respirator that
provides greater protection than that required by the standard; that is, one recommended
for a higher concentration of lead than is present in your workplace. For example, a powered
air-purifying respirator (PAPR) is much more protective than a typical negative pressure
respirator, and may also be more comfortable to wear. A PAPR has a filter, cartridge, or
canister to clean the air, and a power source that continuously blows filtered air into your
breathing zone. Your employer might make a PAPR available to you to ease the burden of
having to wear a respirator for long periods of time. The standard provides that you can
obtain a PAPR upon request.

Your employer must also start a Respiratory Protection Program. This program must include
written procedures for the proper selection, use, cleaning, storage, and maintenance of
respirators.

Your employer must ensure that your respirator facepiece fits properly. Proper fit of a
respirator facepiece is critical to your protection from airborne lead. Obtaining a proper fit on
each employee may require your employer to make available several different types of
respirator masks. To ensure that your respirator fits properly and that facepiece leakage is
minimal, your employer must give you either a qualitative or quantitative fit test as specified

You must also receive from your employer proper training in the use of respirators. Your
employer is required to teach you how to wear a respirator, to know why it is needed, and
to understand its limitations.

The standard provides that if your respirator uses filter elements, you must be given an
opportunity to change the filter elements whenever an increase in breathing resistance is
detected. You also must be permitted to periodically leave your work area to wash your face
and respirator facepiece whenever necessary to prevent skin irritation. If you ever have
difficulty in breathing during a fit test or while using a respirator, your employer must make
a medical examination available to you to determine whether you can safely wear a
respirator. The result of this examination may be to give you a positive pressure respirator
CONTINUED: Lead Management Program

All medical surveillance required by the standard must be performed by or under the supervision of a licensed physician. The employer must provide required medical surveillance without cost to employees and at a reasonable time and place. The standard's medical surveillance program has two parts: periodic biological monitoring and medical examinations.

Your employer's obligation to offer you medical surveillance is triggered by the results of the air monitoring program. Medical surveillance must be made available to all employees who are exposed in excess of the action level for more than 30 days a year. The initial phase of the medical surveillance program, which includes blood lead level tests and medical examinations, must be completed for all covered employees no later than August 28, 1979. Priority within this first round of medical surveillance must be given to employees whom the employer has determined to be at greatest risk from continued exposure (for example, those with the longest prior exposure to lead, or those with the highest current exposure). Thereafter, the employer must periodically make medical surveillance—both biological monitoring and medical examinations—available to all covered employees.

Biological monitoring under the standard consists of blood lead level (PbB) and zinc protoporphyrin (ZPP) tests at least every 6 months after the initial PbB test. A zinc protoporphyrin (ZPP) test is a very useful blood test which measures an effect of lead on your body. Thus, biological monitoring under the standard is currently limited to PbB testing. If a worker’s PbB exceeds 40 ug/100g, the monitoring frequency must be increased from every 6 months to at least every 2 months and not reduced until two consecutive PbB tests indicate a blood lead level below 40 ug/100g. Each time your PbB is determined to be over 40 ug/100g, your employer must notify you of this in writing within five working days of his receipt of the test results. The employer must also inform you that the standard requires temporary medical removal with economic protection when your PbB exceeds certain criteria. (See Discussion of Medical Removal Protection-Paragraph (k).) During the first year of the standard, this removal criterion is 80 ug/100g. Anytime your PbB exceeds 80 ug/100g your employer must make you available to you a prompt follow-up PbB test to ascertain your PbB. If the two tests both exceed 80 ug/100g and you are temporarily removed, then your employer must make successive PbB tests available to you on a monthly basis during the period of your removal.

Medical examinations beyond the initial one must be made available on an annual basis if your blood lead level exceeds 40 ug/100g at any time during the preceding year. The initial examination will provide information to establish a baseline to which subsequent data can be compared. An initial medical examination must also be made available (prior to assignment) for each employee being assigned for the first time to an area where the airborne concentration of lead equals or exceeds the action level. In addition, a medical examination or consultation must be made available as soon as possible if you notify your employer that you are experiencing signs or symptoms commonly associated with lead poisoning or that you have difficulty breathing while wearing a respirator or during a respirator fit test. You must also be provided a medical examination or consultation if you notify your employer that you desire medical advice concerning the effects of current or past exposure to lead on your ability to procreate a healthy child.

Finally, appropriate follow-up medical examinations or consultations may also be provided for employees who have been temporarily removed from exposure under the medical removal protection provisions of the standard. (See Part IX, below.)

The standard specifies the minimum content of pre-assignment and annual medical examinations. The content of other types of medical examinations and consultations is left up to the sound discretion of the examining physician. Pre-assignment and annual medical examinations must include (1) a detailed work history and medical history, (2) a thorough physical examination, and (3) a series of laboratory tests designed to check your blood chemistry and your kidney function. In addition, at any time upon your request, a laboratory evaluation of male fertility will be made (microscopic examination of a sperm sample), or a pregnancy test will be given.

The standard does not require that you participate in any of the medical procedures, tests, etc. which your employer is required to make available to you. Medical surveillance can, however, play a very important role in protecting your health. You are strongly encouraged, therefore, to participate in a meaningful fashion. The standard contains a multiple physician review mechanism which would give you a chance to have a physician of your choice directly participate in the medical surveillance program. If you were dissatisfied with an examination by a physician chosen by your employer, you could select a second physician to conduct an
Lead Management Program

In cases where the examining physician determines that chelation is appropriate, you must be notified in writing of this fact before such treatment. This will inform you of a potentially harmful treatment, and allow you to obtain a second opinion.

IX. MEDICAL REMOVAL PROTECTION - PARAGRAPH (K)

Excessive lead absorption subjects you to increased risk of disease. Medical removal protection (MRP) is a means of protecting you when, for whatever reasons, other methods, such as engineering controls, work practices, and respirators, have failed to provide the protection you need. MRP involves the temporary removal of a worker from his or her regular job to a place of significantly lower exposure without any loss of earnings, seniority, or other employment rights or benefits. The purpose of this program is to cease further lead absorption and allow your body to naturally excrete lead which has previously been absorbed. Temporary medical removal can result from an elevated blood lead level, or a medical opinion. Up to 18 months of protection is provided as a result of either form of removal. The vast majority of removed workers, however, will return to their former jobs long before this eighteen month period expires. The standard contains special provisions to deal with the extraordinary but possible case where a longterm worker's blood lead level does not adequately decline during eighteen months of removal.

During the first year of the standard, if your blood lead level is 80 ug/100g or above you must be removed from any exposure where your air lead level without a respirator would be 100 ug/m3 or above. If you are removed from your normal job you may not be returned until your blood lead level declines to at least 60 ug/100g. These criteria for removal and return will change according to the following schedule:

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<td></td>
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<tr>
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<td>After Mar. 1, 1981</td>
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<td>30 and above</td>
</tr>
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<td>After Mar. 1, 1982</td>
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</tr>
<tr>
<td></td>
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You may also be removed from exposure even if your blood lead levels are below these criteria if a final medical determination indicates that you temporarily need reduced lead exposure for medical reasons. If the physician who is implementing your employers medical program makes a final written opinion recommending your removal or other special protective measures, your employer must implement the physician's recommendation. If you are removed in this manner, you may only be returned when the doctor indicates that it is safe for you to do so.

The standard does not give specific instructions dealing with what an employer must do with a removed worker. Your job assignment upon removal is a matter for you, your employer and your union (if any) to work out consistent with existing procedures for job assignments. Each removal must be accomplished in a manner consistent with existing collective bargaining relationships. Your employer is given broad discretion to implement temporary removals so long as no attempt is made to override existing agreements. Similarly, a removed worker is provided no right to veto an employer's choice which satisfies the standard.

In most cases, employers will likely transfer removed employees to other jobs with sufficiently low lead exposure. Alternatively, a worker's hours may be reduced so that the time weighted average exposure is reduced, or he or she may be temporarily laid off if no other alternative is feasible.

In all of these situations, MRP benefits must be provided during the period of removal - i.e., you continue to receive the same earnings, seniority, and other rights and benefits you would have had if you had not been removed. Earnings includes more than just your base wage; it includes overtime, shift differentials, incentives, and other compensation you would have earned if you had not been removed. During the period of removal you must also be provided with appropriate follow-up medical surveillance. If you were removed because your blood lead level was too high, you must be provided with a monthly blood test. If a medical opinion caused your removal, you must be provided medical tests or examinations that the
doctor believes to be appropriate. If you do not participate in this follow up medical surveillance, you may lose your eligibility for MRP benefits.

When you are medically eligible to return to your former job, your employer must return you to your “former job status.” This means that you are entitled to the position, wages, benefits, etc., you would have had if you had not been removed. If you would still be in your old job if no removal had occurred that is where you go back. If not, you are returned consistent with whatever job assignment discretion your employer would have had if no removal had occurred. MRP only seeks to maintain your rights, not expand them or diminish them.

If you are removed under MRP and you are also eligible for worker compensation or other compensation for lost wages, your employer’s MRP benefits obligation is reduced by the amount that you actually receive from these other sources. This is also true if you obtain other employment during the time you are laid off with MRP benefits.

The standard also covers situations where an employer voluntarily removes a worker from exposure to lead due to the effects of lead on the employee’s medical condition, even though the standard does not require removal. In these situations MRP benefits must still be provided as though the standard required removal. Finally, it is important to note that in all cases where removal is required, respirators cannot be used as a substitute. Respirators may be used before removal becomes necessary, but not as an alternative to a transfer to a low exposure job, or to a lay-off with MRP benefits.

X. EMPLOYEE INFORMATION AND TRAINING - PARAGRAPH (L)

Your employer is required to provide an information and training program for all employees exposed to lead above the action level or who may suffer skin or eye irritation from lead. This program must inform these employees of the specific hazards associated with their work environment, protective measures which can be taken, the danger of lead to their bodies (including their reproductive systems), and their rights under the standard. In addition your employer must make readily available to all employees, including those exposed below the action level, a copy of the standard and its appendices and must distribute to all employees any materials provided to the employer by the Occupational Safety and Health Administration (OSHA).

Your employer is required to complete this training program for all employees by August 28, 1979. After this date, all new employees must be trained prior to initial assignment to areas where there is a possibility of exposure over the action level.

This training program must also be provided at least annually thereafter.

XI. SIGNS - PARAGRAPH (M)

The standard requires that the following warning sign be posted in work areas where the exposure to lead exceeds the PEL:

WARNING
LEAD WORK AREA
NO SMOKING OR EATING

XII. RECORDKEEPING - PARAGRAPH (N)

Your employer is required to keep all records of exposure monitoring for airborne lead. These records must include the name and job classification of employees measured, details of the sampling and analytic techniques, the results of this sampling, and the type of respiratory protection being worn by the person sampled. Your employer is also required to keep all records of biological monitoring and medical examination results. These must include the names of the employees, the physician’s written opinion, and a copy of the results of the examination. All of the above kinds of records must be kept for 40 years, or for at least 20 years after your termination of employment, whichever is longer.

Recordkeeping is also required if you are temporarily removed from your job under the medical removal protection program. This record must include your name and social security number, the date of your removal and return, how the removal was or is being accomplished, and whether or not the reason for the removal was an elevated blood lead level. Your employer is required to keep each medical removal record only for as long as the
duration of an employee’s employment.

The standard requires that if you request to see or copy environmental monitoring, blood lead level monitoring, or medical removal records, they must be made available to you or to a representative that you authorize. Your union also has access to these records. Medical records other than PBB’s must also be provided upon request to you, to your physician or to any other person whom you may specifically designate. Your union does not have access to your personal medical records unless you authorize their access.

XIII. OBSERVATIONS OF MONITORING - PARAGRAPHS (O)

When air monitoring for lead is performed at your workplace as required by this standard, your employer must allow you or someone you designate to act as an observer of the monitoring. Observers are entitled to an explanation of the measurement procedure, and to record the results obtained. Since results will not normally be available at the time of the monitoring, observers are entitled to record or receive the results of the monitoring when returned by the laboratory. Your employer is required to provide the observer with any personal protective devices required to be worn by employees working in the area that is being monitored. The employer must require the observer to wear all such equipment and to comply with all other applicable safety and health procedures.

XIV. FOR ADDITIONAL INFORMATION

A. Copies of the Standard and explanatory material may be obtained by writing or calling the OSHA Docket Office, U.S. Department of Labor, room N2634, 200 Constitution Avenue, N.W., Washington DC 20210. Telephone: (202) 219-7894.


B. Additional information about the standard, its enforcement, and your employer’s compliance can be obtained from the nearest OSHA Area Office listed in your telephone directory under United States Government/Department of Labor.

[60 FR 52856, Oct. 11, 1995; 63 FR 1152, Jan. 8, 1998; 71 FR 16673, April 3,
CONTINUED: Lead Management Program

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http://www.osha.gov/pls/oshaweb/owadisp.show_document?p_table=...