Chapter 296-857 WAC, LEAD

WAC 296-857-100, Scope, Exposure Criteria, and Initial Assessment

WAC 296-857-10010, Scope and Exposure Criteria,

(1) This chapter applies to all occupational exposures to lead.

Definitions:
Lead means metallic lead, inorganic lead compounds, and organic lead soaps. Tetraethyl lead and all other organic lead compounds are excluded from this definition.
Exposure is the contact an employee has with lead, whether or not protection is provided by respirators or other personal protective equipment (PPE). Exposure can occur through various routes of entry such as inhalation, ingestion, skin contact, or skin absorption.

Note:
Working with any of the following materials is covered by the scope of the rule:

- Lead containing coatings
- Suspect coatings
    - Facility/structure constructed prior to 1978
    - Corrosion protection coatings
        - Structural metal
        - Maritime
- Lead containing products
    - Lead shot or ingots
    - Ammunition
    - Solder
    - Lead containing alloys
    - Lead grout
    - Smelting and casting
    - Precious metals
    - Contaminated soils
- Other materials containing lead

Note on Initial Protections:

- For all work falling under this rule there are, at minimum, basic requirements for housekeeping, training, and handwashing.
- For work which involves minor disturbance of lead containing materials, such as using hand tools for cutting or scraping coatings, cleaning up lead containing debris, or handling metals with 20% or more lead content, employers must also conduct blood lead testing and allow voluntary use of respirators, until a comprehensive exposure assessment is completed.
- Respirators must be required and interim controls put in place for work with a potential for significant lead exposure. The following activities are examples of work which can create exposures above the permissible exposure limit.

- Using power tools to cut, grind, sand or scrape lead containing coatings or materials
- Abrasive blasting lead containing coatings or materials
- Welding or torch cutting metals that contain lead or have been coated with lead containing materials (removing the lead coatings will significantly reduce exposures, but small residual quantities of lead can remain and generate significant exposures)

Note:
Work is typically not covered by this rule when:

- Air levels are maintained below <1.5 µg/m³ (statistical zero for the monitoring methods detailed in this rule)
- Non-pulverizing work with cold (room temperature) material, particularly handwork, with materials that are less than 5000 ppm of lead content and less than 1.0 mg/cm² in lead-containing coatings.
- Pulverizing work, such as use of power tools, on materials with less than 600 ppm lead content
- Hot work or burning, such as during welding and cutting of materials, with less than 50 ppm lead content (other potential hazards must be addressed)

(2) The following criteria are used for evaluating full-shift exposures to lead in the workplace

(a) Airborne lead exposures

(i) An 8-hour workday is the basis for the airborne lead exposure criteria. Compare an employee's complete daily exposure to the equivalent 8-hour exposure (TWA_{8e}).

(ii) The equivalent 8-hour exposure is the sum of lead exposure concentrations multiplied by the length of exposure at each concentration, with the sum divided by 8 hours.

Note:
Computing the equivalent 8-hour exposure time-weighted average (TWA_{8e}):

$$\mathrm{TWA}_{8e} = \frac{C_1 * T_1 + C_2 * T_2 + \cdots + C_n * T_n}{480}$$

Where:
C_n is the concentration during the nth period during the day
T_n is length of time for the nth period in minutes

All periods of exposure must be included for the complete work shift each day.

(iii) The following table gives the airborne lead criteria used in this rule.

Level	Description
Monitoring Level (ML) 10 µg/m³ TWA_{8e}	• Determine lead exposures for any conditions with the potential of employee exposure at or above 10 µg/m³ TWA_{8e}. • Employers must put in place a program to ensure work is tracked and appropriate work practices are used to limit lead exposures.
Permissible Exposure Limit (PEL) 20 µg/m³ TWA_{8e}	• Lead exposures greater than 20 µg/m³ TWA_{8e} must be controlled by means of feasible engineering and administrative systems. • Employers must put in place a written program to manage workplace controls, including monitoring the effective use of controls. • Employers provide respiratory protection whenever exposure exceeds 20 µg/m³ TWA_{8e} and make sure employees use it. • Hygiene and housekeeping practices must be in place to keep high lead exposures limited to lead control areas.

(b) Blood lead levels

(i) The following table gives the blood lead criteria used in this rule.

Level	Description
Advisory Level 5 µg/dL	• Employees will be advised that their blood lead level is elevated when testing indicates a blood lead level greater than 5 µg/dL.
Action Level 10 µg/dL	• Employers must review exposures, work practices and controls and document action plans to reduce exposures when employees are found to have blood lead levels above 10 µg/dL. • Employees medically removed from work generally do not return to lead work until their blood lead level is below 10 µg/dL.
Action Shift Increase of 5 µg/dL	• Compared to any test in the previous 12 months. • Employers must review exposures, work practices and controls and document action plans to reduce exposures
Chronic Removal Level 20 µg/dL	• Employers must provide employees with other equivalent employment without lead exposure above the monitoring level, 10 µg/m³ TWA_{8e}, when 2 or more test results within twelve months indicate blood lead levels above 20 µg/dL.
Acute Removal Level 30 µg/dL	• Employers must provide employees with other equivalent employment without lead exposure above the monitoring

	level when any single test results indicate blood lead levels above 30 µg/dL.

WAC 296-857-10020, Implementation Schedule

To be determined.

WAC 296-857-10030, Multi-employer worksites

(1) Facility owners arranging for construction or maintenance work must ensure contractors and other employers conducting work are provided relevant information about lead in the facility prior to bidding or contracting for work.
   (a) Past surveys of the facility and information about any lead handling activities must be made available in writing.
   (b) For work which will potentially disturb lead containing materials, the facility owner must make sure a survey is conducted to document potential lead hazards if existing information is insufficient.

(2) Employers controlling work with actual or potential lead exposure must make sure other employers, with workers involved with the work or in adjacent areas, are provided written documentation of information necessary for assessing lead exposure.

WAC 296-857-10040, Determining employees are not covered by this rule

(1) Employers who have used due diligence to survey their work environment and materials in use and found no lead containing materials are not required to do further evaluation.
   (a) If an employee requests information on lead content of materials in the work place, the employer must make that information available in writing. Existing resources, such as Safety Data Sheets and building inspection records, may be used. The employer does not need to conduct new testing or research for materials that have been adequately evaluated and documented.
   (b) If the employee request identifies materials that have not been previously cleared, the employer must evaluate the materials and provide a written assessment within 14 days. Interim protection must be provided for any work activity involving these materials with a potential for exposure above the monitoring level, 10 µg/m³ TWA_{8e}.

(2) When work involves lead containing materials, but the employer has determined there is no hazard of inhalation or ingestion of lead during the work, the employer must document their assessment.
   (a) The assessment must be available to employees in writing in the workplace.
   (b) The assessment must clearly demonstrate that employee lead exposures do not have the potential for a significant uptake of lead.
   (c) The assessment must be based on clearly convincing information, including any combination of the following: objective data about the materials and the work, professional engineering or industrial hygiene assessments, bulk sampling, air monitoring, or surface sampling.

(d) Provide information on lead as required by Chapter 296-901 WAC, Globally Harmonized System for Hazard Communication.

(e) The assessment cannot be considered clearly convincing if there are indications of any of the following circumstances

(i) Employee exposure to measurable airborne lead concentrations, 1.5 µg/m³ or greater using the monitoring methods detailed in this rule.

(ii) Work with molten metals containing lead more than 1 ppm.

(iii) Hot work or burning of materials, such as with welding and torch cutting, with 50 ppm lead content.

(iv) Work which pulverizes materials containing 600 ppm lead, such as use of power tools for cutting, grinding or sanding.

(v) Any work that manipulates materials at ambient temperature with a content of 5000 ppm (0.5%) or more of lead.

(vi) Work with paints and coatings with more than 1.0 mg/cm² of lead.

(vii) Work which leaves free lead on employee accessible surfaces at a concentration of 4.3 µg/dm² or more.

WAC 296-857-10050, Initial classification of employee exposure

(1) Prior to starting any work that may expose workers to lead, an initial determination must be made of the expected exposure based on the highest reasonable exposure level that may be generated by the work activity. The initial exposure assessment must determine whether employees could be exposed above the permissible exposure limit, 20 µg/m³ TWA_{8e}, or the monitoring level, 10 µg/m³ TWA_{8e}, which will determine which portions of the rule must be implemented in the workplace at the start of work.

(2) Until a comprehensive exposure assessment is completed per WAC 296-857-40010, Classifying exposure for employees covered by the rule, the provisions of this rule must be applied based on the initial determination of employee exposure.

(3) The initial determination may be based on:

(a) Professional engineering or industrial hygiene assessments of objective data available prior to commencing work.

(b) Recognized and generally accepted good safety and health practices in industry consensus documents or published in academic journals.

(c) Presumption rules found in subsection (4) of this section.

(d) Following an Industry Compliance Protocol promulgated by the department.

(4) Exposure presumption rules:

(a) The following tables give the presumed exposure levels for tasks as described.

(i) Employers may rely on these levels for an initial determination until it is feasible to obtain a thorough exposure assessment. Monitoring and laboratory analysis is typically feasible within 2 to 3 business days.

(ii) For some tasks, as indicated in the table, employers may rely on the presumed exposure level for short-term work or permanently. In these cases, further exposure assessment is not necessary, but can allow for more flexibility for, protective equipment, work practices and controls if

actual exposure levels are determined to be lower than the presumed levels.

(iii) Tables in the Compliance Protocols may differ from these tables based on different expectations for work practices.

(b) Worker protection must be consistent with the presumed exposure levels for work in the tables "Presumed Exposure Levels" or based on a professional estimate of exposure following recognized and generally accepted good safety and health practices.

(c) Once a complete assessment is conducted meeting the requirements in WAC 296-857-40010, Classifying exposure for employees covered by the rule, worker protections, work practices, and medical services must be adjusted based on this assessment.

(d) Presumed Exposure Levels

(i) Table of General Industry Tasks

Task	Presumed Exposure Level	Controls and Training	Monitoring requirement
Working with room temperature materials containing lead but with no lead containing surface materials	Less than: 10 µg/m³ TWA_{8e}	Basic rules WAC 296-857-200	No monitoring required
Working with room temperature materials that have not been disturbed with exposed lead metal or lead containing coatings	Less than: 10 µg/m³ TWA_{8e}	Basic rules WAC 296-857-200	Initial blood lead level if work involves metals containing greater than 20% lead.
Working with room temperature lead containing materials that have been disturbed, such that free lead dust may be released from the matrix of the material, but where visible dust emissions are not present	Greater than: 10 µg/m³ TWA_{8e} Less than: 20 µg/m³ TWA_{8e}	Basic rules WAC 296-857-200 Allow voluntary respirator use when it does not create a hazard.	Initial assessment and initial blood lead level

Working with room temperature lead containing materials in a manner that disturbs the materials or where there is minimal visible dust emitted during the work	Greater than: 20 µg/m³ TWA_{8e} Less than: 200 µg/m³ TWA_{8e}	Basic rules WAC 296-857-200 Exposure controls WAC 296-857-300 Respirator APF of 10 or more	Initial assessment and continuing based on level documented. Initial and continuing blood lead levels
Construction, remodeling, or maintenance work in an active lead control area	Greater than: 20 µg/m³ TWA_{8e} Less than: Based on host employer assessment	Basic rules WAC 296-857-200 Exposure controls WAC 296-857-300 Respirator APF of based on host employer assessment	Initial assessment and continuing based on level documented
Mechanical sanding or grinding lead containing materials with a HEPA filtered local exhaust system	Greater than: 20 µg/m³ TWA_{8e} Less than: 200 µg/m³ TWA_{8e}	Basic rules WAC 296-857-200 Exposure controls WAC 296-857-300 Respirator APF of 10 or more	Initial assessment and continuing based on level documented. Initial and continuing blood lead levels
Mechanical sanding or grinding lead containing materials without controls	Greater than: 200 µg/m³ TWA_{8e} Less than: 2000 µg/m³ TWA_{8e}	Basic rules WAC 296-857-200 Exposure controls WAC 296-857-300 Respirator APF of 100 or more	Initial assessment and continuing based on level documented. Initial and continuing blood lead levels
Chemical or heat stripping of lead containing coatings from non-lead substrates (with a heat gun set at below 1100° F)	Greater than: 20 µg/m³ TWA_{8e} Less than: 200 µg/m³ TWA_{8e}	Basic rules WAC 296-857-200 Exposure controls WAC 296-857-300 Respirator APF of 10 or more	Initial assessment and continuing based on level documented. Initial and continuing blood lead levels

Heat stripping of lead containing coatings with a heat gun at or above 1100° F	Greater than: 200 µg/m³ TWA_{8e} Less than: 2000 µg/m³ TWA_{8e}	Basic rules WAC 296-857-200 Exposure controls WAC 296-857-300 Respirator APF of 100 or more	Initial assessment and continuing based on level documented. Initial and continuing blood lead levels
Welding or torch cutting of non-lead metals where lead containing coatings have been thoroughly stripped to more than 15 cm from the point of action	Greater than: 200 µg/m³ TWA_{8e} Less than: 2000 µg/m³ TWA_{8e}	Basic rules WAC 296-857-200 Exposure controls WAC 296-857-300 Respirator APF of 100 or more	Initial assessment and continuing based on level documented. Initial and continuing blood lead levels
Welding or torch cutting of metals with intact lead containing coatings	Greater than: 2000 µg/m³ TWA_{8e} Less than: 50,000 µg/m³ TWA_{8e}	Basic rules WAC 296-857-200 Exposure controls WAC 296-857-300 Respirator APF of 1000 or more	Initial assessment and continuing based on level documented. Initial and continuing blood lead levels
Working with molten lead in a pot containing less than 10 kg of lead	Greater than: 200 µg/m³ TWA_{8e} Less than: 2000 µg/m³ TWA_{8e}	Basic rules WAC 296-857-200 Exposure controls WAC 296-857-300 Respirator APF of 1000 or more	Initial assessment and continuing based on level documented. Initial and continuing blood lead levels
Working with molten lead in quantities greater than 10 kg	Greater than: 2000 µg/m³ TWA_{8e} Less than: 20,000 µg/m³ TWA_{8e}	Basic rules WAC 296-857-200 Exposure controls WAC 296-857-300 Respirator APF of 1000 or more	Initial assessment and continuing based on level documented. Initial and continuing blood lead levels

(ii) Construction and maintenance tasks

Task	Presumed Exposure Level	Controls and Training	Monitoring requirement
Where lead containing coatings or paint are present: Working around undisturbed lead coatings.	Less than: 10 µg/m³ TWA_{8e}	Basic rules WAC 296-857-200	No monitoring required
Where lead containing coatings or paint are present: Working around disturbed lead coatings.	Greater than: 10 µg/m³ TWA_{8e} Less than: 20 µg/m³ TWA_{8e}	Basic rules WAC 296-857-200 Allow voluntary respirator use when it does not create a hazard.	No monitoring under Compliance Protocol for Incidental Lead Paint Work Otherwise, Initial assessment and initial blood lead level
Where lead containing coatings or paint are present: Manual demolition of structures (e.g., dry wall), manual scraping, manual sanding, heat gun applications, and power tool cleaning with dust collection systems	Greater than: 20 µg/m³ TWA_{8e} Less than: 200 µg/m³ TWA_{8e}	Basic rules WAC 296-857-200 Exposure controls WAC 296-857-300 Respirator APF of 10 or more	No monitoring under Compliance Protocol for Incidental Lead Paint Work Otherwise, Initial assessment and continuing based on level documented. Initial and continuing blood lead levels
Spray painting with lead paint	Greater than: 20 µg/m³ TWA_{8e} Less than: 500 µg/m³ TWA_{8e}	Basic rules WAC 296-857-200 Exposure controls WAC 296-857-300 Respirator APF of 25 or more	Initial assessment and continuing based on level documented
Construction, remodeling, or maintenance work in an active lead control area	Greater than: 20 µg/m³ TWA_{8e} Less than: Based on host employer assessment	Basic rules WAC 296-857-200 Exposure controls WAC 296-857-300 Respirator APF of based on host	Initial assessment and continuing based on level documented

		employer assessment	
Using lead containing mortar; lead burning	Greater than: 500 µg/m³ TWA_{8e} Less than: 2500 µg/m³ TWA_{8e}	Basic rules WAC 296-857-200 Exposure controls WAC 296-857-300 Respirator APF of 125 or more	Initial assessment and continuing based on level documented
Where lead containing coatings or paint are present: Rivet busting; power tool cleaning without dust collection systems; cleanup activities where dry expendable abrasives are used; and abrasive blasting enclosure movement and removal.	Greater than: 500 µg/m³ TWA_{8e} Less than: 2500 µg/m³ TWA_{8e}	Basic rules WAC 296-857-200 Exposure controls WAC 296-857-300 Respirator APF of 125 or more	Initial assessment and continuing based on level documented
Where lead containing coatings or paint are present: Abrasive blasting; Welding; Cutting; and Torch burning.	Greater than: 2500 µg/m³ TWA_{8e}	Basic rules WAC 296-857-200 Exposure controls WAC 296-857-300 Respirator APF of 1000 or more	Initial assessment and continuing based on level documented

(iii) Metal scrapping tasks

Task	Presumed Exposure Level	Controls and Training	Monitoring requirement
Handling lead containing metals with greater than 20% lead content	Greater than: 10 µg/m³ TWA_{8e} Less than: 20 µg/m³ TWA_{8e}	Basic rules WAC 296-857-200 Allow voluntary respirator use when it does not create a hazard.	Initial assessment and initial blood lead level
Where lead containing coatings	Greater than: 500 µg/m³ TWA_{8e}	Basic rules WAC 296-857-200	Initial assessment and continuing

or paint have been removed: • Abrasive blasting; • Welding; • Cutting; and • Torch burning.	Less than: 2500 µg/m³ TWA_{8e}	Exposure controls WAC 296-857-300 Respirator APF of 125 or more	based on level documented
Where lead containing coatings or paint are present: • Abrasive blasting; • Welding; • Cutting; and • Torch burning.	Greater than: 2500 µg/m³ TWA_{8e}	Basic rules WAC 296-857-200 Exposure controls WAC 296-857-300 Respirator APF of 1000 or more	Initial assessment and continuing based on level documented

(iv) Gun range tasks

Task	Presumed Exposure Level	Controls and Training	Monitoring requirement
Range Master/Range safety officer	Greater than: 10 µg/m³ TWA_{8e} Less than: 20 µg/m³ TWA_{8e}	Basic rules WAC 296-857-200 Allow voluntary respirator use when it does not create a hazard.	Initial assessment and initial blood lead level
Firearms trainer in range	Greater than: 10 µg/m³ TWA_{8e} Less than: 20 µg/m³ TWA_{8e}	Basic rules WAC 296-857-200 Allow voluntary respirator use when it does not create a hazard.	Initial assessment and initial blood lead level
Firing weapons in the range	Greater than: 10 µg/m³ TWA_{8e} Less than: 20 µg/m³ TWA_{8e}	Basic rules WAC 296-857-200 Allow voluntary respirator use when it does not create a hazard.	Initial assessment and initial blood lead level

Firearms trainer in classroom	Less than: 10 µg/m³ TWA_{8e}	Basic rules WAC 296-857-200	No monitoring required
Sales	Less than: 10 µg/m³ TWA_{8e}	Basic rules WAC 296-857-200	Initial blood lead level if work involves metals containing greater than 20% lead.
Loading ammunition	Greater than: 10 µg/m³ TWA_{8e} Less than: 20 µg/m³ TWA_{8e}	Basic rules WAC 296-857-200 Allow voluntary respirator use when it does not create a hazard.	Initial assessment and initial blood lead level
Range housekeeping, pickup spent shells and other debris at shooting stations	Greater than: 10 µg/m³ TWA_{8e} Less than: 20 µg/m³ TWA_{8e}	Basic rules WAC 296-857-200 Allow voluntary respirator use when it does not create a hazard.	Initial assessment and initial blood lead level
Range housekeeping, full clean of range	Greater than: 20 µg/m³ TWA_{8e} Less than: 200 µg/m³ TWA_{8e}	Basic rules WAC 296-857-200 Exposure controls WAC 296-857-300 Respirator APF of 10 or more	No monitoring under Compliance Protocol for Incidental Lead Paint Work Otherwise, Initial assessment and continuing based on level documented. Initial and continuing blood lead levels
Emptying bullet traps	Greater than: 200 µg/m³ TWA_{8e} Less than: 2000 µg/m³ TWA_{8e}	Basic rules WAC 296-857-200 Exposure controls WAC 296-857-300 Respirator APF of 100 or more	Initial assessment and continuing based on level documented. Initial and continuing blood lead levels
Range ventilation service	Greater than: 200 µg/m³ TWA_{8e} Less than: 2000 µg/m³ TWA_{8e}	Basic rules WAC 296-857-200 Exposure controls WAC 296-857-300	Initial assessment and continuing based on level documented.

		Respirator APF of 100 or more	Initial and continuing blood lead levels
Berm mining	Greater than: 200 µg/m³ TWA_{8e} Less than: 2000 µg/m³ TWA_{8e}	Basic rules WAC 296-857-200 Exposure controls WAC 296-857-300 Respirator APF of 100 or more	Initial assessment and continuing based on level documented. Initial and continuing blood lead levels

WAC 296-857-200, Basic rules

WAC 296-857-20010, Cleaning practices

(1) Keep lead work areas and surrounding areas as clean of free lead accumulations as feasible.

(2) The following criteria are used to determine if cleaning is sufficient:

(a) For clean areas, where the employer assumes no lead exposure occurs, all employee accessible surfaces must be less than 4.3 µg/dm². All other surfaces in these areas must be below 43 µg/dm².

(i) Single sample testing as described in WAC 296-857-50010 Surface Sampling, may be used for evaluation of clean areas.

(ii) Clean areas include any area of a lead work establishment where employees and other individuals do not use protective equipment, work practices, or controls to prevent lead exposure. Examples of clean areas are lunch rooms, clean change rooms, common areas used by employees not engaged in lead work, parking lots, and areas accessible to the public.

(b) For lead work areas, Single sample testing as described in WAC 296-857-50010, Surface Sampling, indicating surface contamination less than 27 µg/dm² indicates that the areas are clean.

(c) For lead work areas not kept below 27 µg/dm², the four sample testing as described in WAC 296-857-50010, Surface Sampling, is used to determine whether additional cleaning is necessary.

(3) Use vacuuming or other cleaning methods that minimize airborne contamination from cleaning.

(4) Clean and dispose of contaminated items in ways that prevent further exposure in the workplace.

(5) When cleaning with any vacuum cleaner or vacuum system, use and empty the vacuum cleaner in a way that minimizes the release of lead back into the workplace. The vacuum discharge must be HEPA filtered or the discharge must be routed in a manner that does not expose employees to lead.

(6) When using wet cleaning, such as mopping, the work practices need to ensure free lead is removed from the surface.
  (a) Frequent changes of scrubbing materials or rinse water are necessary to ensure lead is not redeposited on the surface being cleaned.
  (b) Use clean and dirty rinse buckets for mops and wipes (2-bucket method).
  (c) Use disposable mops, rags, and wipes when appropriate to reduce recontamination of surfaces.

(7) When you have demonstrated vacuuming, wet cleaning, or other cleaning methods that minimize airborne contamination are ineffective, you may use the following to clean up lead contamination:
  (a) Shoveling, brushing, dry or wet sweeping;
  (b) Compressed air with an effective ventilation system specifically designed to capture dust produced by the compressed air cleaning process.

(8) To prevent unnecessary exposure and accidental spills, keep containers tightly covered when not in use.

WAC 296-857-20020, Training

(1) Make a copy of this chapter (Chapter 296-857 WAC, Lead) readily available to all employees exposed to lead. A copy of the rule may be posted in the work area or on company network or computer resources. A link to the rule or DOSH lead topic page that is readily accessible is sufficient for employees with network access.

(2) Post the current WISHA lead safety poster in lead work areas, where employees report to work, or with other WISHA posters.

(3) For employees exposed to any amount of lead provide the following training:
  (a) Basic training, specific about lead, for each of the following topics:
    (i) Operations and locations in the work area where lead is present.
    (ii) Methods and observations that may be used to detect the presence or release of lead in the work area.
    (iii) For example, a warning sign posted outside of exposure control areas or labels identifying lead- containing materials.
    (iv) Health hazards associated with lead, including the symptoms and effects of exposure such as:
      (A) Reproductive health effects on both males and females.
      (B) Hazards to the developing fetus and children.
      (C) Physical hazards of lead compounds, if any.
  (b) Steps employees can take to protect themselves from lead, including at least the following:
    (i) Appropriate work practices.
    (ii) Exposure controls.
    (iii) Emergency procedures.
    (iv) Personal protective equipment.
    (v) Additional precautions for pregnant employees.
    (vi) Other procedures implemented by you.

(vii) Details of the hazard communication program you developed.

(4) For employees potentially exposed to lead at or above the monitoring level, 10 µg/m³ TWA_{8e}, and employees exposed to lead compounds that may cause eye or skin irritation, such as lead arsenate or lead azide, provide the following training:

(a) Basic training given in subsection (3).

(b) Additional training that:

(i) Informs employees about the contents of this chapter.

(ii) Informs employees about the specific nature of the job assignment and operations that could result in exposure to lead at or above the AL. This includes characteristics of the operation such as the types of materials involved, equipment, and exposure controls.

(A) Exposure controls include local exhaust system ventilation and work practices, such as work practices related to PPE use, housekeeping, and lunchroom use.

(iii) Informs employees about the purpose of blood testing, medical examinations, and consultations.

(iv) Describes how you are fulfilling the blood testing, medical examination and consultation, and medical removal requirements of this chapter.

(v) Instructs employees to not practice chelation to remove lead from their bodies except under direction of a physician.

(vi) Informs about content of the current exposure control plan.

(vii) Informs about the employee's right to access records.

(5) For construction work, the competent person for any work must receive sufficient training to be able to identify and correct lead hazards in the workplace.

WAC 296-857-20030, Handwashing.

(1) Provide handwashing facilities that meet the requirements in these separate chapters:

(a) For general industry applications, go to the safety and health core rules' section, Provide convenient and clean washing facilities, WAC 296-800-23025.

(b) For construction work, go to the safety standards for construction work section, Sanitation, WAC 296-155-140.

(2) Locate handwashing facilities near or next to work activities with lead exposure.

(3) Make sure employees wash their hands and faces at break times and at the end of the work shift.

(4) Effective handwashing requires that the methods used free up lead on the hands or face and provide a mechanism for removing the lead. Thorough scrubbing and rinsing or wiping are generally both necessary to effectively clean hands and faces. Objective wipe tests can be used to verify effective handwashing.

Note:

- When employees wash while showering at the end of the work shift (turn to WAC 296-857-30040) they will meet this requirement to wash their hands and faces at the end of the work shift.

- When work activities are located in areas where exposures are above the permissible exposure limit, 20 µg/m³ TWA_{8e}, the location of handwashing facilities will also depend on where lunchrooms or eating areas are located (turn to WAC 296-857-50040).

WAC 296-857-20040, Voluntary Respirator Use

(1) Employers may provide or allow respirators for voluntary use by employees whose exposures do not exceed the permissible exposure limit, 20 µg/m³ TWA_{8e}. Lead exposures below the permissible exposure limit can contribute to employee blood lead levels and use of respirators is generally appropriate.

(2) Employers must allow voluntary use of respirators by employees who request it when exposures are at or above the monitoring level, 10 µg/m³ TWA_{8e}, unless the respirator use will create a greater hazard.

(3) Employers may require employees to use respirators at any level of exposure. When this is done, follow the requirements in Chapter 296-842 WAC, Respirators, for required respirators.

(4) Review respirator use to make sure voluntary use of the respirator is safe as required in WAC 296-842-11005(1).

(5) Develop a written respirator program as required by chapter 296-842 WAC, Respirators, and including those elements specifically required in WAC 296-842-11005(3).

(6) To be effective at protecting workers from lead, air-purifying respirators must have 100 series filters (N, R, or P designation may be determined by other factors in the work environment) or high-efficiency particulate air (HEPA) filters for powered air purifying respirators (PAPR).

WAC 296-857-300, Exposure Controls

WAC 296-857-30010, Exposure control areas

(1) Establish temporary or permanent exposure control areas, where there is potential for employee exposure to airborne lead above the permissible exposure limit, 20 µg/m³ TWA_{8e}.

Note:
Even when controls reduce exposures to below the permissible exposure limit, 20 µg/m³ TWA_{8e}, an exposure control area and plan must be implemented when failure of the controls, poor maintenance of the controls, or employee error or misuses of the controls has the potential to result in an exposure above the permissible exposure limit.

(2) Clearly identify the boundaries of exposure control areas from the rest of the workplace in any way that minimizes employee access;

(3) Post signs at access points to exposure control areas that are easy to read (for example, they are kept clean and well lit), including this warning:

DANGER LEAD WORK AREA MAY DAMAGE FERTILITY OR THE UNBORN CHILD CAUSES DAMAGE TO THE CENTRAL NERVOUS SYSTEM DO NOT EAT, DRINK, OR SMOKE IN THIS AREA

(4) Keep signs and areas near them free of statements that contradict or detract from the warning message.
(5) Allow only authorized personnel to enter exposure control areas.
(6) Make sure food, beverages, tobacco products, and gum are not present or consumed in exposure control areas. In addition, do not allow cosmetics to be present or applied in these areas.

WAC 296-857-30020, Exposure control plan.

(1) Establish and implement a site-specific, written exposure control plan that reflects current work conditions and includes at least the following for your exposure control areas:
(2) A description of each activity releasing lead, for example:
    (a) The number of employees exposed (crew size);
    (b) Employee job responsibilities;
    (c) Current exposure controls;
    (d) Materials involved;
    (e) Equipment used;
    (f) Operating procedures;
    (g) Maintenance practices.
(3) Air monitoring data which documents the sources of lead emissions;
(4) Employee input on control strategies and priorities;
(5) A report of the technology considered for exposure controls;
(6) A description of what you will do, including engineering plans and studies used as a basis for selecting exposure controls, to reduce lead exposures to:
    (a) Below the permissible exposure limit, 20 µg/m³ TWA_{8e}, if feasible, or;
    (b) The lowest achievable level, when exposures cannot be reduced below the permissible exposure limit.
    (c) If there are exposures above the permissible exposure limit, 20 µg/m³ TWA_{8e}, a periodic review of control improvements and options (at least every three years) must be conducted:
        (i) Each option considered must be listed and an appropriate engineering analysis of the relative priorities of the options must be given
        (ii) Input must be requested from affected employees.
        (iii) Available resources must be applied towards the highest priority items in a timely manner
        (iv) A detailed schedule for implementing the plan, including construction contracts, purchase orders for equipment, and other documentation.

(7) Relevant work practices, including at least:
  (a) Use of personal protective equipment, including respirators;
  (b) Housekeeping;
  (c) Use of change areas, showers, lunchrooms, and handwashing facilities.

(8) A job rotation schedule, when this will be used to reduce airborne exposure. Include the following information:
  (a) Name and unique identifier of each employee on the rotation schedule;
  (b) Each employee's daily exposure duration and level at each job or work station location;
  (c) Other information that may help evaluate the reliability of using job rotation to reduce airborne exposure.

(9) Frequent and regular inspections of job sites, materials, and equipment. When construction work is performed, these inspections must be made by a competent person and documented in writing.

(10) Other relevant information.

(11) Review and update your exposure control plan to make sure it is effective and reflects current work conditions.

(12) Make your exposure control plan available at the worksite.

(13) Allow affected employees and their designated representatives to review or copy the plan when requested.

WAC 296-857-30030, Exposure controls

(1) Use feasible exposure controls to reduce exposures to or below the permissible exposure limit, 20 µg/m³ TWA_{8e}, or as low as achievable.

IMPORTANT:
- Respirators and other personal protective equipment (PPE) are not exposure controls.
- Exposure controls include the use of ventilation systems, wet methods, and work practices to reduce airborne exposures. For more examples, see Respiratory hazards, chapter 296-841 WAC.

(2) When mechanical ventilation is used as an exposure control:
  (a) Establish baseline readings for appropriate system performance indicators such as capture velocity, duct velocity, and static pressure which can be used to verify the effectiveness of the system.
  (a) For each indicator, identify values that indicate the system is operating effectively and identify actions that will be taken for measurements outside that range to correct the system performance or otherwise prevent exposure to lead
  (b) Routinely measure, least every three months, the system performance indicators
  (c) In addition to routine measurement, measure within five days of any change in production, process, or control that may result in a change in system performance.

(d) System performance indicators need to be measured each time the system is set up at a job site or when a system that hasn't been used for a long period of time is put back into operation.

(3) When ventilation air is recirculated back into the workplace:

(a) Use a high-efficiency particulate air (HEPA) filter and a reliable back-up filter.

(b) Use controls that monitor lead levels in the air returning to the workplace and automatically bypass the system if it fails

(c) Make sure the bypass controls are maintained and operated according to the manufacturer's specifications.

(d) Exemption: When hand-held, vacuum-shrouded tools equipped with HEPA filtration are used during construction work, you aren't required to monitor lead levels in the tool's exhaust air or have an automatic bypass

WAC 296-857-30040, Showering, changing, and eating facilities.

(1) Provide the following facilities for employees who work in exposure control areas and keep them as free of lead contamination as feasible:

(a) Shower facilities;

(b) Clean change rooms with storage for street clothes separated from storage for protective clothing, work clothes, and protective equipment, to prevent cross-contamination from lead;

(c) Lunchrooms.

Note:

- Lunchrooms may be located within exposure control areas, but are considered separate from the exposure control area.
- You may provide eating areas instead of lunchrooms for employees performing construction work.
- Change areas are allowed for employees performing construction work as long as they are kept clean and meet other requirements in this chapter.

(2) Make sure employees do the following before leaving the exposure control area to enter the eating areas or lunchroom:

(a) Remove protective clothing and equipment, or remove dust from protective clothing and equipment using cleaning methods that don't disperse lead dust, such as vacuums equipped with HEPA filters.

(b) Wash their hands and faces before eating, drinking, smoking, applying cosmetics, or taking breaks.

(c) Don't leave the workplace wearing any clothing or equipment worn while working in the exposure control area (including shoes or boots, unless effective shoe covers are used in the exposure control area).

(3) Make sure eating areas such as lunchrooms

(d) Are located so they are readily accessible to the employees;

(e) Meet these additional requirements when lunchrooms are provided and located inside exposure control areas:
  (i) Operate with a temperature-controlled, HEPA-filtered air supply;
  (ii) Operate under positive pressure compared to surrounding areas;
  (iii) Are maintained below the monitoring level, 10 µg/m³ TWA_{8e}, and
  (iv) Free lead on accessible surfaces is kept below 4.3 µg/dm².

WAC 296-857-30050, Protective clothing and equipment.

(1) Provide employees with appropriate protective clothing and equipment.
(2) When lead is present, the PPE hazard assessment, required by WAC 296-800-16005, must include evaluation of the following types of PPE:
  (a) Coveralls or similar full-body work clothing;
  (b) Gloves;
  (c) Hats;
  (d) Shoes or disposable shoe covers;
  (e) Face shields or vented goggles, when necessary to prevent eye irritation.
(3) Replace or launder protective clothing daily for exposures above 80 µg/m³, and at least weekly for lower exposures.
(4) Make sure PPE is used and maintained properly following the manufacturer's instructions.
  (a) Do not allow cleaning that includes blowing, shaking, or other actions that release lead dust into the air.
  (b) Do not allow employees to clean or launder protective clothing or equipment at home.
(5) Make sure employees put on protective clothing in a clean change room.
(6) Make sure employees remove protective clothing in a change room prior to leaving the work site.
(7) Place contaminated protective clothing that will be cleaned, laundered, or disposed in a closed container that prevents the release of lead located in the change room.
(8) Repair or replace PPE as needed to maintain effectiveness.
(9) Inform individuals who clean or launder protective clothing about the potentially harmful health effects associated with lead. Provide this information in writing. For example, you can provide a copy of Health and hazard information about lead, found in WAC 296-857-700.
(10) Label containers of contaminated PPE with the following warning:

DANGER: CLOTHING AND EQUIPMENT CONTAMINATED WITH LEAD.
MAY CAUSE FERTILITY OR THE UNBORD CHILD.
CAUSES DAMAGE TO THE CENTRAL NERVOUS SYSTEM.
DO NOT EAT, DRINK OR SMOKE WHEN HANDLING.
DO NOT REMOVE DUST BY BLOWING OR SHAKING.
DISPOSE OF LEAD CONTAMINATED WASH WATER IN ACCORDANCE WITH APPLICABLE LOCAL, STATE, OR FEDERAL REGULATIONS.

WAC 296-857-30060, Required Respirator Use

(1) Develop a written respirator program as required by chapter 296-842 WAC, Respirators, and include the following additional requirements:
  (a) That employees use respirators when:
    (i) They're in an exposure control area and controls are not reducing exposure to below the permissible exposure limit, 20 µg/m³ TWA_{8e}
    (ii) Responding to emergencies
    (iii) Under additional exposure conditions when you identify the need for respiratory protection to prevent the uptake of lead.
(2) Make sure air-purifying respirators selected have high-efficiency particulate air (HEPA) filters or 100 series filters (N, R, or P designation may be determined by other factors in the work environment).
(3) Employees may request a powered air-purifying respirator (PAPR) when this type of respirator will provide proper protection and a licensed health care professional (LHCP) allows this type of respirator in their written opinion.

WAC 296-857-400, Characterizing and Tracking Employee Exposure

WAC 296-857-40010, Classifying exposure for employees covered by the rule

(1) Employers must evaluate the exposure of employees covered by this rule and classify the exposure into one of three categories based on highest reasonably expected exposure documented by sampling. Sampling must cover worst case scenarios.
  (a) Basic Rules, for exposures determined to be below the permissible exposure limit, 20 µg/m³ TWA_{8e}.
  (b) Monitoring Levels, for exposures determined to be below the permissible exposure limit, 20 µg/m³ TWA_{8e} but at or above the monitoring level, 10 µg/m³ TWA_{8e}. Monitoring levels also includes work that involves handling of metals with greater than 20% lead content.
  (c) Exposure Control Levels, for all exposure at or above the permissible exposure limit, 20 µg/m³ TWA_{8e}.
(2) For exposures at or above the permissible exposure limit, 20 µg/m³ TWA_{8e}, sampling must also provide sufficient information to select appropriate personal protective equipment, respirators, work practices, and controls.
(3) The criteria are for comparison to the time weighted average for an 8-hour shift.
(4) Airborne lead exposure criteria are based on an 8-hour workday and are compared to the employee's time-weighted average exposure for shifts of 8-hours or less. Multiply the criteria by 8 and divide by the number of hours in the work shift to adjust the criteria for a shift longer than 8 hours.
(5) For the purposes of this rule, employee exposure is that exposure which would occur if the employee were not using a respirator.

(6) Employers may use task based assessments and provide protection for each task based on applying the rule for that task as if it was done for the full shift.

(7) Classification can be done through any of the following methods

(a) Full-shift exposure monitoring

(i) Air samples collected from the breathing zone of representative employees drawn through the full shift are a direct measurement of exposure.

(A) Samples must be collected and analyzed using the methods given in WAC 296-857-500, Lead Sampling and Analysis, or other accredited methods with as good or better accuracy.

(B) Sampling and analytical error must be taken into account when interpreting results, but are otherwise directly comparable to the exposure criteria of this rule.

(ii) Partial shift sampling used to estimate exposures requires additional documentation.

(A) Documentation of the shift work must be provided to show that the period of sampling is representative of the highest exposure for the shift.

(B) For any period of the shift that is treated as having no exposure, there must be clear documentation of activities and rationale for this assessment.

(b) Past monitoring of work may be used with the following additional documentation about the work at the time of monitoring and the current work:

(i) Training of the workers must be consistent.

(ii) Work methods must be consistent

(iii) Materials must be consistent

(iv) The prior monitoring must have been conducted within the past 12 months.

(c) Exposure assessments provided in Compliance Protocols promulgated by the department may be relied on for short term projects lasting less than one week or as provided for in the Model Exposure Control Plan. Additional assessments of conditions and exposures must be conducted as given in the Model Exposure Control Plan.

(d) Any other objective information (other than direct monitoring of the work currently or within the last 12 months) which clearly demonstrates the level of exposure can be used to establish exposure in the following circumstances:

(i) Where objective information clearly demonstrates exposures cannot be at or above the monitoring level, 10 µg/m³ TWA_{8e}, this assessment can be relied on permanently. The documentation must be retained throughout the activity and made available to employees during training and at their request.

(ii) For exposures possibly at or above the monitoring level, 10 µg/m³ TWA_{8e}, objective information can be relied on for 2 days, while conducting direct measurement of employee exposure. The accuracy and applicability of

the objective information must be assessed, and employee protective clothing and equipment must be selected based on the highest reasonably expected exposure level indicated by the objective information as a whole.

WAC 296-857-40020, Monitoring of employee exposure over time

(1) Employers must evaluate the exposure of employees who are exposed at or above the permissible exposure limit, 20 µg/m³ TWA_{8e}, at least every three months by direct measurement of representative employee exposure.
(2) Employers must evaluate the exposure of employees who are exposed at or above the monitoring level, 10 µg/m³ TWA_{8e}, at least every six months by direct measurement of representative employee exposure.
(3) Periodic exposure monitoring must use the procedures given in WAC 296-857-40010(7).
(4) Reducing exposure monitoring frequency may be done when a lowering of exposure is demonstrated by two or more consecutive exposure evaluations made at least seven days apart.
(5) If an exposure assessment indicates the exposure has increased, continued monitoring must at the schedule for the new, elevated level of exposure.

WAC 296-857-40030, Notifying employees of exposure monitoring results

(1) Provide written notification of exposure monitoring results to employees represented by your exposure evaluation within five business days after the results become known to you.
(2) When employee exposure monitoring results are above the permissible exposure limit, 20 µg/m³ TWA_{8e}, also provide written notification to employees of all the following within fifteen business days after the results become known to you:
    (a) Actions being taken to reduce exposures and an implementation schedule.
    (b) Any reason why exposures can't be lowered to below the permissible exposure limit, 20 µg/m³ TWA_{8e}.

Note:

- Corrective actions include exposure controls and any repairs to exposure controls. For examples of exposure controls, see Table 1 in another chapter, Respiratory hazards, chapter 296-841 WAC.
- You can notify affected employees either individually or post the notifications in areas readily accessible to affected employees.
- Posted notification may need specific information that allows affected employees to determine which monitoring results apply to them
- Notification may be:
    - In any written form, such as hand-written or e-mail;
    - Limited to the required information, such as exposure monitoring results.
- When notifying employees about corrective actions, your notification may refer them to a separate document that is available and provides the required information.

WAC 296-857-40040, Exposure records

(1) Establish and keep complete and accurate records for all exposure monitoring conducted under this chapter. Make sure the exposure record includes at least:
  (a) The name and unique identifier of
    (i) The employee sampled;
    (ii) All other employees represented by the sampled employee
  (b) A description of the methods used to obtain exposure monitoring results and evidence of the method's accuracy
  (c) A description of the procedure used to obtain representative employee exposure monitoring results;
  (d) The date, number, duration, location, and result of each sample taken;
  (e) Any environmental variables that could affect exposure concentration measurements, for example, temperature, humidity, altitude, and wind speed;
  (f) The type of respirators and other protective equipment worn, if any;
  (g) Exposure controls in use and work practices, for example, ventilation systems, enclosures, use of wet methods, and specific work practices.
(2) All exposure assessments, whether through direct monitoring of exposure, use of recent monitoring of previous work, or use of other objective information sources, must be kept to show employee exposure history.
(3) Keep employee exposure records for at least thirty years.

WAC 296-857-500, Lead Sampling and Analysis

WAC 296-857-50010, Surface Sampling

(1) Surface sampling is conducted to determine the amount of free lead dust and debris is found on a surface. This is lead that can be picked up on clothing and skin or disturbed and made airborne with the potential for ingestion or inhalation.
(2) In order to analyze surface samples, use a laboratory with an established analysis protocol with a demonstrated accuracy of ±25% with a confidence level of 95%.
(3) The laboratory analyzing the samples will specify appropriate wiping materials, solvents, and storage containers.
(4) Single Sample Method—appropriate for verifying a surface is clean, has less than 4.3 µg/dm².
  (a) Use a template with an area of a square decimeter (10 centimeters squared or a circle of diameter 11.3 centimeters) to determine the sample area.
    (i) If the surface configuration prevents using a template, the area sampled must be measured accurately.
    (ii) The surface template or measurement method must be documented in the sampling record.
  (b) Wipe the entire sampling area evenly with the wipe material and repeat wiping in several directions.
  (c) Submit the wipe material to the laboratory for analysis.

(d) If a square decimeter was sampled the laboratory analysis result can be compared directly to the level of 4.3 µg/dm² to determine if the surface was clean.

(e) If the sampling surface was a different area, the surface density must be computed based on the actual area sampled.

(5) Four Sample Method—used to determine the effectiveness of cleaning.

(a) Use a template with an area of a square decimeter (10 centimeters squared or a circle of diameter 11.3 centimeters) to determine the sample area.

(i) If the surface configuration prevents using a template, the area sampled must be measured accurately.

(ii) The surface template or measurement method must be documented in the sampling record.

(iii) Two side-by-side sampling areas will be used, one for samples prior to cleaning and one for samples following cleaning.

(b) Prior to cleaning:

(i) Wipe the entire sampling area evenly with the wipe material and repeat wiping in several directions.

(ii) Submit the wipe material to the laboratory for analysis as sample A.

(iii) Wipe the same sampling area evenly with a second piece of wipe material and repeat wiping in several directions.

(iv) Submit the second wipe material to the laboratory for analysis as sample B.

(c) Following cleaning:

(i) Wipe the entire second, adjacent, sampling area evenly with third piece of wipe material and repeat wiping in several directions.

(ii) Submit the wipe material to the laboratory for analysis as sample C.

(iii) Wipe the same sampling area evenly with a fourth piece of wipe material and repeat wiping in several directions.

(iv) Submit the fourth wipe material to the laboratory for analysis as sample D.

(d) If a square decimeter was sampled the laboratory analysis result of sample A can be compared directly to the key level of 4.3 µg/dm² to determine if the surface was clean. If the surface is clean, the other three samples may not need to be analyzed.

(e) For lead work areas, the result of sample A can be compared to the cleaning level of 27 µg/dm². If the result is below this level, the cleaning of this work area is considered effective and the other three samples may not need to be analyzed.

(f) If the sampling surface was a different area, the surface density must be computed based on the actual area sampled.

(g) Four sample interpretation:

(i) The difference between A and B indicates the accumulated free lead on the surface between cleanings. High values of A, much greater than 27 µg/dm², may represent a significant hazard and the employer may need to address this in their program.

(ii) If the three samples, B, C, and D, are similar in magnitude then the cleaning methods are efficient at removing free lead from the surface. If these samples are elevated, significantly above 4.3 µg/dm² in clean areas or 27 µg/dm² in lead work areas, then it may be necessary to consider sealing or changing the surface material to limit employee exposure to lead contained in the surface. For example, the surface may be coated with a lead containing material or a porous material may have become impregnated with lead.

(iii) If sample D is statistically lower than sample C, it is an indication that cleaning is leaving a significant amount of free lead on the surface and improvements in cleaning are necessary.

Note:
Conversion Table—Surface Sampling
µg/dm² is equivalent to µg/100 cm²

SI	Customary Units
4.3 µg/dm²	40 µg/ft²
27 µg/dm²	250 µg/ft²
43 µg/dm²	400 µg/ft²

WAC 296-857-50020, Air Sampling

(1) Air sampling is used to determine the quantity of lead in the air breathed by employees.

(2) Samples must be collected from the vicinity of the employee's mouth and nose, within 45 cm (18 inches).

(3) Sampling, using one or more discrete samples, must cover the entire period of lead exposure during the work shift.

Note:

- Sampling other than personal breathing zone sampling may be useful in managing lead exposures. Results of other sampling is considered to be objective data and may be part of the data used to estimate exposures, particularly for negative exposure assessments.
- Lead dust and fume may be carried by air currents and form plumes of greater density. Area samples more than a short distance from employees, may have much higher or lower results and often do not properly represent employee exposure.
- Clearance samples may be most useful in verifying that lead work has been concluded and used to determine that an exposure control area may be opened up for people to enter without concern for lead exposure.

(4) In order to analyze air samples, use a laboratory with an established analysis protocol with a demonstrated accuracy of ±25% with a confidence level of 95%.

(5) The laboratory must use a method capable of detecting 2 µg of lead in a sample.

(6) The laboratory analyzing the samples will specify appropriate sampling media, equipment, and air flow rates.
(7) Sample volumes must be sufficient to detect airborne lead concentrations as low as 1.5 µg/m³ for samples used to establish negative exposure assessments. Lower volume samples may be used for monitoring when higher concentrations of lead are expected.

WAC 296-857-600, Blood Lead, Medical Monitoring, and Medical Removal

WAC 296-857-60010, Monitoring employee blood lead levels

(1) Blood lead testing must be made available at no cost to employees and at a reasonable time and place.
(2) Select a licensed health care provider and lab qualified to collect blood and conduct the analysis. These services are covered under Washington State Department of Health rules. It is recommended that the providers have experience with occupational medicine.
(3) Employers must make sure employees receive blood testing results within 5 days of receiving them from the medical providers.
(4) Any blood lead test indicating blood lead levels above the advisory level, 5 µg/dL, must be communicated to the employee along with information on the medical significance of elevated blood leads including information in this standard.
(5) The employer must review exposures, work practices and controls in response to any blood lead test indicating blood lead levels above the action level, 10 µg/dL, or for any blood lead level result indicating an increase in blood lead level of 5 µg/dL or more. The employer must create a written plan for reducing lead exposures through new or corrected controls or work practices and pvide it to employees within 15 days of receiving the blood lead testing results.
(6) Employers must make initial blood lead testing, to establish a baseline blood lead level, available to any employee who could have an exposure at or above the monitoring level, 10 µg/m³ TWA_{8e}, or who handle metals with greater than 20% lead content.
    (a) Blood testing must be available to the employee prior to starting lead work if the lead exposure is reasonably anticipated.
    (b) For exposures that were not anticipated, blood lead testing must be made available within 2 days of discovering exposures to lead could have been at or above the monitoring level, 10 µg/m³ TWA_{8e}.
    (c) If the employee baseline test was collected prior to the employee conducting any lead work and shows an elevated blood lead level, greater than the advisory level, 5 µg/dL, the employer should provide information on potential exposures to lead outside work and recommended that the employee follow-up with prior employers regarding exposure to lead and their rights.
(7) Follow-up testing is required in the following circumstances
    (a) If the employee was given an initial test, but monitoring of work clearly documents there was no exposure at or above the monitoring level, 10 µg/m³ TWA_{8e}, and the workers blood lead level is below the advisory level, 5 ug/dl , then no follow-up test is required.

(b) If employee exposures may be at or above the monitoring level, 10 µg/m³ TWA_{8e}, a follow-up test must be made available every 2 months for 6 months and every 6 months after that.
(c) If an employee stops participating in lead work, either because of the conclusion of work or moving to another position, a follow-up test must be made available within 2 weeks of completing work.
(d) If an employee blood lead level is greater than the action level, 10 µg/dL, testing must be made available every 2 months.
(e) If an employee has a blood lead level at or above the acute removal level, 30 µg/dL, or has a second test within twelve months showing a blood lead level at or above the chronic removal level, 20 µg/dL, then provide a follow-up test within 2 weeks to confirm this level.
(f) If an employee has been medically removed, provide blood lead testing monthly until 2 consecutive tests show the employee's blood lead level has decreased to below the action level, 10 µg/dL.

(8) Employers may retest for any blood lead level of 20 µg/dL or greater.
(a) The employee must be informed immediately if the employer is delaying medical removal until a retest is done.
(b) The retest must be completed within 14 days.
(c) The second result may be substituted for the original result.
(d) Medical removal must be initiated within 14 days of the original test if blood lead levels greater than the medical removal level, 20 µg/dL for chronic removal or 30 µg/dL for acute removal, are confirmed or if a retest is not completed within the 14 day period.

WAC 296-857-60020, Reporting blood lead tests to the department

(1) Employers who arrange for blood lead testing must submit workplace information to the department using the provided forms or systems.
(a) A complete "Report of Blood-Lead Test" may be submitted with the order for the blood lead test or delivered by the employee at the time of testing to be included in the laboratory's mandatory reporting to the Department of Health.
(b) Employers may also report the blood lead test directly to the department using other electronic forms or systems provided for that purpose.

(2) Make sure the following information is provided accurately:
(a) Name and contact information of the employee
(b) Employee birthdate
(c) Employee gender
(d) Industry sector
(e) Employee occupation
(f) Employee work tasks involving lead
(g) Employer name
(h) Employer phone number
(i) Test date

WAC 296-857-60030, When to make medical examinations available

(1) Make medical examinations available at no cost to employees and at a reasonable time and place.

(2) If employees have a potential for exposure at or above the monitoring level, 10 µg/m³ TWA_{8e}, for more than 30 days in any 12-month period, then medical examinations must be made available to employees prior to assignment or as soon as possible for exposures discovered for ongoing work.

(3) Medical examinations must be made available annually to employees who have blood lead levels at or above the action level, 10 µg/dL, within the prior twelve months.

(4) Medical examinations must be made as soon as possible, upon notification by an employee either that the employee has developed signs or symptoms commonly associated with lead intoxication, that the employee desires medical advice concerning the effects of current or past exposure to lead on the employee's ability to procreate a healthy child, that the employee is pregnant, or that the employee has demonstrated difficulty in breathing during a respirator fitting test or during use.

(5) Make medical examinations available when medically necessary to employees who have been medically removed from work.

WAC 296-857-60040, Employee's may request a second opinion

(1) The employer must inform employees of the right to a second opinion including the following information:

  (a) The employee may select the medical physician who will conduct the second opinion examination.

  (b) The employee has 15 working days from the employer arranged examination or the notice of their right to a second opinion examination to request the second opinion examination, whichever is later.

  (c) The employee must request the second opinion examination in writing and initiate steps to make an appointment from their chosen physician within the 15-day period.

  (d) The employer will pay for the second opinion examination, as long as the employee meets the requirement to request and arrange for the appointment in a timely manner.

  (e) The employer must inform the employee how the second opinion examination will be paid for if the employee does not request and arrange for the examination in a timely manner (employers may offer to pay for examinations not required in this rule).

(2) When a second opinion examination is conducted, the same information provided for the employer selected examination must be provided to the employee's physician.

(3) If the second opinion examination results and recommendations are consistent with the employer's arranged examination, then those results will be followed.

(4) If the second opinion examination results differ from the employer arranged examination results, work with the employee, employer's physician, and employee's phycisian to resolve the differences between the two examination results or recommendations.
(5) If the two physicians cannot resolve the differences, the employer may need to bring in a third physician, selected with the consent of the employee and employee's physician.
    (a) The third physician may mediate the results discussion or conduct a third examination.
    (b) The third physician's results and recommendations will be used unless the employee and employer agree to follow one of the two previous results.

WAC 296-857-60050, Selecting a medical physician

(1) Select a medical physician who will conduct or supervise examinations and consultations. Make sure the physician follows the protocols in WAC 296-857-800, Medical Protocols, for all examinations under this standard.
(2) Make sure the physician has the following information.
    (c) A copy of this chapter (WAC 296-857-100 through WAC 296-857-900)
    (d) A description of the duties of the employee being evaluated and how these duties relate to lead exposure.
    (e) The anticipated or representative exposure monitoring results for the employee being evaluated, including monitoring results pertaining to any other toxic substances, if applicable.
    (f) A description of the personal protective equipment (PPE) each employee being evaluated uses or will use.
    (g) Information from previous employment-related examinations, such as prior blood lead determinations and written medical opinions, when you have access to this information and it's not available to the examining physician.
    (h) Instructions that the written opinions the physician provides to you be limited to the following information:
        (i) The physician's opinion about whether or not the employee has medical conditions that would put the employee at increased risk for material impairment to health from exposure to lead (other than elevated blood lead levels);
        (ii) Any recommended special protective measures or limitations for the employee's exposure to lead;
        (iii) Any recommended limitation on the use of respirators, including a determination of whether the employee can wear a powered air-purifying respirator when an physician determines the employee can't wear a negative-pressure respirator;
        (iv) Whether the employee's blood lead result is any one of the following:
            (A) Above the advisory level, 5 µg/dL;
            (B) Above the action level 10 µg/dL, follow-up will be required at this level;

(C) Above the chronic removal level, 20 µg/dL for a second test within 12 months, which indicates the employee must be removed from exposure.

(D) Above the acute removal level, 30 µg/dL, for any single test, which indicates the employee must be removed from exposure.

(v) Instruction to advise the employee of any occupational or non-occupational medical condition that dictates further medical examination or treatment.

Note:
Medical evaluations and exams are also required for respirator use under Chapter 296-842 WAC, Respirators, and other substance specific rules. It is appropriate to have the examination requirements of any or all of these rules covered in a single examination. Coordinate with the physician to make sure this is done efficiently.

WAC 296-857-60070, Medical removal requirements

(1) Temporarily remove an employee from areas where lead exposure is at or above the monitoring level, 10 µg/m³ TWA_{8e}, when either of the following occurs:

(a) The written opinion from your physician recommends removal from lead exposures due to a medical condition that puts the employee at increased risk for material impairment to health, or,

(b) Results from a periodic blood test and 2-week follow-up show the employee's blood lead level (BLL) is above the acute removal level, 30 µg/dL, or that this is the second result within 12 months above the chronic removal level, 20 µg/dL.

(i) If a follow-up blood test is not conducted within 2 weeks, temporarily remove the employee from exposure to lead at or above monitoring level, 10 µg/m³ TWA_{8e}.

(2) Follow any protective measures or limitations specified for the employee during temporary removal by your physician's (employer's physician) written opinion.

(a) When your employee seeks a 2nd opinion, continue to follow your physician's written opinion until either:

(i) Complete the process for 2nd and 3rd physician opinions, or,

(ii) You and the employee reach an agreement consistent with the recommendations of one of the physicians.

(3) Continue the employee's temporary removal until one of the following occurs:

(a) Results from 2 consecutive blood tests show the employee's blood lead level has decreased to below the action level, 10 µg/dL.

(b) The employee's lead related work concludes. For example, the employee's hiring agreement specifies work on a single project and the project has been completed.

(c) A final medical determination has been completed. Follow the physician's recommendations, including special protective measures and any limitations on the employee' exposure to lead, and do either of the following:

(i) Return the employee to their former job status, when indicated; or,
(ii) Permanently remove the employee from work with lead exposure at or above the monitoring level, 10 µg/m³ TWA_{8e}.

Note:
When returning the employee to their former job status, you may apply terms established by a collective bargaining agreement to make sure the employee's current and previous rights to a specific job classification or position that existed before removal are fulfilled.
Some options for removal, if recommended by the physician, may include:

- Reducing the employee's daily exposure time
- Transferring the employee to another job, if available.

(4) Provide medical examinations and consultations to obtain a final medical determination, when the employee has not been returned to their former job status by the end of 18 months of temporary removal. This provides you with a concluding written opinion.
(a) For a final medical determination, do all the following:
(i) Follow the Medical Examination Process and the content as detailed in WAC 296-857-800, Medical Protocols.
(ii) Include the employee's medical record as described in Medical Records, WAC 296-857-xxxxxx, as part of the information you provide the physician for this final medical determination

Note:
When a final medical determination allows an employee with a BLL above 10 µg/dL to return to his or her former job status, temporary removal is not automatically required when the employee's blood lead level is above the long term removal level, 20 µg/dL unless specified by a written opinion.

(5) Maintain medical removal benefits throughout the temporary medical removal period. These include the employee's current pay rate, seniority, and other employment rights and benefits as though the employee had not been removed.
(a) Also provide medical removal benefits to an employee when:
(i) You choose to medically remove the employee, or place other limitations on the employee; and,
(ii) Medical removal or limitations aren't required by this chapter.

Note:
You may choose to provide medical removal benefits for employees who refuse to participate in blood testing, medical examinations, or medical consultations made available to them during the removal period.
If you are required to provide medical removal benefits and the employee will receive compensation for lost pay from other sources, you may reduce your medical removal benefit

obligation to adjust for the amount provided by these sources at the time the employee receives such compensation.

- This reduction in your medical removal benefit obligation doesn't include worker's compensation payments the employee receives for treatment-related expenses.
- Examples of other sources are:
  - Public or employer-funded compensation programs, including worker's compensation programs;
  - Employment by another employer, made possible by the employee's removal.

WAC 296-857-60080, Medical removal benefits

(1) The employer must provide up to eighteen months of medical removal protection benefits on each occasion that an employee is removed from exposure to lead or otherwise limited pursuant to this chapter.

(2) For the purposes of this section, the requirement that an employer provide medical removal protection benefits means that the employer must maintain the earnings, seniority and other employment rights and benefits of an employee as though the employee had not been removed from normal exposure to lead or otherwise limited. Employees may be assigned to work without lead exposure if the employee's earnings and rights are maintained.

(3) Medical removal benefits are required when:

(a) An employee's blood lead level is determined to be greater than the acute removal level, 30 µg/dL.

(b) An employee's blood lead level is determined to be greater than the chronic removal level, 20 µg/dL, for the second time within a 12-month period.

(c) An employee is determined by a physician or other licensed health care professional to be at risk for permanent material impairment due to lead exposure.

(d) An employer elects to remove an employee from lead exposure due to any other health concern.

(4) Medical removal benefits may be discontinued when the employee blood lead level is below the blood lead action level, 10 µg/dL, in two consecutive tests or when cleared to return to work by a physician or other licensed health care professional.

(5) Medical removal benefits may be terminated for employees hired on a temporary or project basis for work that has concluded unless,

(a) when the employee contract period concludes, the employer continues with the lead related tasks, medical removal benefits must continue.

(b) an employee's occupation specifically involves lead and their ongoing elevated blood lead levels or other medical conditions will prevent gainful employment with another employer, the exposing employer must continue medical removal benefits under this section.

(6) During the period of time that an employee is removed from normal exposure to lead or otherwise limited, the employer may condition the provision of medical removal protection benefits upon the employee's participation in follow-up medical surveillance made available pursuant to this section.

(7) If an industrial insurance claim (worker's compensation) is filed for an employee lead-related disability, then the employer shall continue to provide medical removal protection benefits pending disposition of the claim. To the extent wage replacement payments are made during the period of removal, the employer's medical removal protection paymet obligation shall be reduced by such amount. The employer shall receive no credit for workers' compensation payments received by the employee for treatment related expenses.

(8) Other credits. The employer's obligation to provide medical removal protection benefits to a removed employee shall be reduced to the extent that the employee receives compensation for earnings lost during the period of removal either from a publicly or employer-funded compensation program, or receives income from employment with another employer made possible by virtue of the employee's removal.

(9) The employer shall take the following measures with respect to any employee removed from exposure to lead due to an elevated blood lead level whose blood lead level has not declined within the past eighteen months of removal so that the employee has been returned to his or her former job status:

(a) The employer shall make available to the employee a medical examination pursuant to this section to obtain a final medical determination with respect to the employee;

(b) The employer shall assure that the final medical determination obtained indicates whether or not the employee may be returned to his or her former job status, and if not, what steps should be taken to protect the employee's health;

(c) Where the final medical determination has not yet been obtained, or once obtained indicates that the employee may not yet be returned to his or her former job status, the employer shall continue to provide medical removal protection benefits to the employee until either the employee is returned to former job status, or a final medical determination is made that the employee is incapable of ever safely returning to his or her former job status.

(d) Where the employer acts pursuant to a final medical determination which permits the return of the employee to his or her former job status despite what would otherwise be an unacceptable blood lead level, later questions concerning removing the employee again shall be decided by a final medical determination. The employer need not automatically remove such an employee pursuant to the blood lead level removal criteria provided by this section.

WAC 296-857-60090, Medical records

IMPORTANT:
This section applies any time a medical record is created for an employee exposed to lead.

(1) Establish and maintain accurate medical records for each employee receiving a blood test, medical examination, or consultation for lead exposure and make sure the records include the following:

(a) The employee's name and unique identifier;
(b) A description of the employee's duties;
(c) A copy of the licensed health care professional's (LHCP's) written opinions;
(d) The anticipated or representative employee exposure monitoring results provided to the LHCP for the employee;
(e) A copy of the results of biological monitoring, including blood lead testing;
(f) A copy of medical examination results including required medical and work histories;
(g) A copy of any employee medical complaints related to lead exposure;
(h) A description of laboratory procedures used;
(i) A copy of any standards or guidelines used to interpret test results, or references to such standards or guidelines.

(2) Establish and maintain accurate medical removal records for each occasion that temporary medical removal occurs, and make sure the records include the following:
(a) The name and unique identifier of the employee removed;
(b) The date the employee was medically removed;
(c) A statement of whether or not removal was due to a blood lead level (BLL) above 50 □g/dl;
(d) A brief description of how each removal was or is being accomplished;
(e) The date the employee was returned to their former job status.

(3) Maintain medical records for the duration of employment plus thirty years.

(4) Maintain each employee's medical removal records for at least the duration of the employee's employment.

Note:
Your medical provider may keep these records for you.
Medical removal records may be kept as part of the employee's medical record.
Medical records, except for physicians' written opinions, may be accessed only with the employee's written consent.

WAC 296-857-700, Lead Information

General Health Information About Lead
Contents of the DOSH Lead Hazard Poster

Elemental lead (metallic).

- All inorganic lead compounds such as those found in paint.
- A class of organic lead compounds called lead soaps.
- Tetraethyl lead and all other organic lead compounds aren't covered by this chapter.

How does lead get into my body?

- Breathing (inhaling) lead can occur when you are exposed to lead-containing particles such as dust, fume, or mist. Once inhaled, these particles deposit lead in your upper respiratory tract and lungs.
- Swallowing (ingesting) lead can occur when:
    - You have lead on your hands and then handle food, smoke cigarettes, or put on lipstick or lip balm;
    - Food, cigarettes, or other items have been placed where lead could settle on them, and then you put the contaminated items in your mouth.
- Lead particles brought home on your clothes, shoes, or body can be inhaled or ingested by household members.
- Lead is not absorbed through your skin, except for tetraethyl lead and other organic lead compounds that aren't covered by this chapter.

What happens after lead enters my body?

- Once you inhale or swallow lead, it is absorbed into your blood and circulates throughout your body.
    - Nearly all (ninety-five percent) of inhaled lead is absorbed by your blood, while about ten percent of ingested lead is absorbed. By contrast, children can absorb five times as much ingested lead as adults.
- Some of this blood lead is quickly excreted from the body in urine. The remaining blood lead is transported to various organs and body tissues where it's stored.
    - Most of the blood lead (ninety percent) gets stored in your bones. This stored lead is released back into your blood over time.
    - The amount of stored lead grows when you keep absorbing more lead than your body excretes.
    - The more lead you store, the greater your chances of substantial and permanent damage to your body and health, in both the short term and long term.
- Even if you aren't having immediate symptoms, stored lead may cause irreversible damage; first to individual cells, then to organs, then to whole body systems.
- You may not feel the effects of stored lead for years, and when you finally do, there may not be much that can be done about it.

Why is it important to monitor my blood lead levels?

- There is an established link between blood lead levels and various health effects.
- Your blood lead level is an important indicator of how likely you are to acquire, over time, a lead- related health problem.:
- A measurement of your blood lead level shows how much lead is currently in your blood.
    - This includes:
        - Lead absorbed due to recent exposures; AND
        - Stored lead (from past exposure) being released from bones and other organs/body tissues.

    - Blood lead tests do not tell you how much lead is stored in your bones and other organs/body tissues.
- Blood lead testing may be abbreviated as "PbB" or “BLL” and usually reported as an amount of lead per a standard amount (volume) of blood. The most common units are micrograms of lead per deciliter of blood (abbreviated as "µg/dL blood").
- Blood lead levels are usually below 5 µg/dL. Testing showing blood lead above this indicates an exposure to lead from work, hobbies, or the environment.
- Blood lead levels above 10 µg/dL are of general concern and the source of lead should be identified and steps taken to reduce lead exposure.
- Blood lead levels above 10 µg/dL require the employer to review lead exposures in the workplace and ensure controls and work practices are correct.
- Persistent blood lead levels of 20 µg/dL (more than one test in 12 months) or a single test of 30 µg/dL represent a potential for material harm. Employers are required to remove employees with these blood lead levels from work with lead.
- In addition to blood testing, you'll need regular medical examinations and consultations to further monitor your health when your blood lead level climbs above 10 µg/dL.

What health effects are linked with lead exposure?

- Lead is a potent, systemic poison and affects many body organs and systems. Early symptoms of lead poisoning are often subtle and nonspecific.
- Nervous system symptoms include:
    - Listlessness.
    - Fatigue.
    - Irritability.
    - Sleep disturbance.
    - Headache.
    - Difficulty concentrating.
    - Decreased libido (sex drive).
- Digestive system symptoms include:
    - Abdominal cramps (lead colic).
    - Loss of appetite (anorexia).
    - Nausea.
    - Constipation.
    - Diarrhea.
- Musculoskeletal system symptoms include:
    - Joint pain (arthralgia).
    - Muscle pain or tenderness (myalgia).
- The health impairment and disease that lead causes can show up after periods of exposure as short as days or as long as several years.
    - Very high, short-term exposures are extremely unusual, but not impossible. For example, if a single dose of lead is large enough, it can kill you in a matter of days. Serious brain damage (acute encephalopathy) may arise quickly after such

exposures, beginning with seizures; followed by coma and then death from cardiorespiratory arrest (your brain stops telling your heart to beat and your lungs to breathe).

- It's more common to have exposure to low levels of lead (though still above the permissible exposure limit) sustained over a long period of time such as months or years (chronic exposure).

WAC 296-857-800, Medical Protocols

Information for Physicians

There are two primary medical services employers are required to provide for employees under this standard: blood lead testing and medical examinations. Medical examinations may be done for health surveillance purposes to verify exposed employees are, and remain, healthy. This involves a baseline examination and annual checks. Employers may also require a determination of risk for significant material impairment to manage employee medical removal from work involving lead exposure.

Qualifications

Medical physicians may perform employee medical surveillance as allowed under their licensing. Physicians should review the requirements of this rule, and be aware of recommendations for assessing occupational lead exposure through sources such as the Center for Disease Control and Prevention's National Institute for Occupational Safety and Health or the American College of Occupational and Environmental Medicine.

The one circumstance requiring additional credentialing is when resolving a dispute between an initial medical finding and second opinion examination. In this case, the physician reviewing the case must be a board certified occupational medicine physician.

Employer responsibilities

Employers arranging for medical surveillance services for employees are required to ensure these services are provided at no cost to the employee. These services are not to be billed to the employee and the testing and exams must be conducted during paid work time. The employee should not incur travel costs. The employer is responsible for communicating with the employee about their rights and results, but communication from the health care provider is appropriate, and may be preferred when confidential medical information is involved. Significant medical findings not relevant to lead exposure should only be communicated directly to the employee.

Employee rights.

- Employees have a right to opt out at any time and resume services at any time.

- Employees with blood lead levels above the removal criteria or who are at risk for significant material impairment due to lead exposure have a right to pay and other benefits while removed from work for health reasons.
    - The acute blood lead removal level is 30 µg/dL.
    - The long term blood lead removal level is 20 µg/dL, which applies when the employee has had a previous test, no more than 12 months earlier at this level.
    - Employee's benefit rights are also triggered by a medical finding of a risk for significant, permanent material impairment, or when an employer otherwise elects to remove an employee from lead exposure due to medical concerns.
- Employees have a right to request a second opinion, at no cost to the employee, for any medical findings. If the initial opinion and second opinion cannot be resolved, the employer must arrange for review of the case by a board certified occupational medicine physician.
- Employees may initiate a workers' compensation claim at any time. The rights for medical removal under this rule are different than the rights to compensation under industrial insurance. The intent of this rule is to identify dangerous lead exposures and manage those exposures to prevent permanent material impairment of employees.

Blood Lead Testing

Employers are required to arrange for blood lead testing for any employee who may possibly be exposed at or above the airborne lead monitoring level, 10 µg/m³ TWA_{8e}. Follow-up testing is required at 2 month intervals for the first six months and every six months thereafter, as long as the employee is or may be exposed to lead at or above 10 µg/m³ TWA_{8e} and does not have elevated blood lead levels. More frequent testing will be required when an elevated blood lead level of 10 µg/dL is found or when increase of 5 µg/dL is found within a 12-month period.

Employee blood levels of 5 µg/dL or more are considered elevated and employees should be advised of this by the employer or physician along with information on the effects of lead exposure and information on protecting themselves.

Content of Medical Examinations

When conducting an initial, periodic, or high-blood lead medical examination and consultation, the following elements should be covered. The physician may amend or add to this as dictated by good medical practice. Recent tests or examinations may be relied upon at the discretion of the physician and do not need to be repeated unnecessarily.

- A detailed work history and medical history including:
    - Past and current exposure to lead (occupational and non-occupational activities)
    - Personal habits including smoking, hygiene, and hobbies
    - History of gastrointestinal, hematological, renal, cardiovascular, reproductive, and neurological problems

    - Medications, supplements, vitamins, and review of dietary habits
- A complete physical examination with particular attention to:
    - Gastrointestinal, hematological, renal, cardiovascular, and neurological systems
    - Pulmonary status, if respiratory protection will be used
- A blood pressure measurement
- A blood sample and analysis that determines:
    - Blood lead level (BLL)
    - Hematocrit and hemoglobin determinations, red cell indices, and examination of peripheral smear morphology
    - Blood urea nitrogen
    - Serum creatinine
- A routine urinalysis with microscopic examination
- Additional tests the examining physician determines are necessary

An unplanned medical examination and consultation in response to unexpected lead exposure

- Content as determined by the examining phycisian
- A pregnancy test or laboratory evaluation of male fertility, if requested by the employee

Medical removal examinations and consultations

- Content as determined by the examining physician
- A pregnancy test or laboratory evaluation of male fertility, if requested by the employee
- A final medical determination within 18 months from when the removal began

2nd opinion and review examinations and consultations

- Medical examinations, consultations, and laboratory tests as necessary to complete the physician's review.

Communication with Employee and Employer

The results of a medical examination are confidential and only certain information should be communicated openly with the employer.

- The physician's opinion about whether or not the employee has medical conditions that would put the employee at increased risk for material impairment to health from exposure to lead (other than elevated blood lead levels);
- Any recommended special protective measures or limitations for the employee's exposure to lead;
- Any recommended limitation on the use of respirators, including a determination of whether the employee can wear a powered air-purifying respirator when an physician determines the employee can't wear a negative-pressure respirator;
- Whether the employee's blood lead result is any one of the following:
    - Above the advisory level, 5 µg/dL;
    - Above the action level 10 µg/dL, follow-up will be required at this level;

  - Above the chronic removal level, 20 µg/dL for a second test within 12 months, which indicates the employee must be removed from exposure.
  - Above the acute removal level, 30 µg/dL, for any single test, which indicates the employee must be removed from exposure.
- Instruction to advise the employee of any occupational or non-occupational medical condition that dictates further medical examination or treatment.

Other observations, test results, and advice from the physician may be communicated to the employee directly and placed into the employee file or record. Communication with phycisians working directly for the employer is appropriate, where the confidentiality of the information will be preserved.

Medical Removal Recommendations

Removing a worker from lead work for medical reasons triggers medical removal benefits for the employee which require the employer to maintain the worker's pay, benefits, seniority and other rights. The employer is encouraged to keep employees on staff with changes in duties to prevent lead exposure, but will still need to pay the employee even if other work is not available.

The blood lead level criteria in this standard have been set based on the risk for significant material impairment in the general working population. These levels are not no-effect levels but recommendations for medical removal should not be based solely on blood lead levels, which may be elevated, but are below the medical removal criteria levels. If an employee has signs or symptoms of significant material impairment thought to be due to lead exposure, a recommendation for medical removal is appropriate, even with low blood lead levels. Conversely, an employee who has been medically removed may be allowed to return to work with blood lead levels above the action level, 10 µg/dL, when the physician considers them healthy and expects that the work conditions will not cause the employees blood lead levels to remain above this level (such as when improvements have been made to workplace controls or personal protective equipment). The physician may set conditions for return to work.

This rule does not address reproductive or fetal development issues as these are beyond the jurisdiction of the department to regulate. Employees and employers can be counselled on these issues and medical findings related to them. Employers are encouraged to assess these issues on a case by case basis respecting employee privacy rights.

Recordkeeping

Employers are required to make sure medical records related to this rule must be preserved for the length of employment of the worker plus 30 years. Physicians may maintain the records, but must have in place provisions to notify employers and employees if circumstances arise where further retention of the records is in jeopardy, such as closing a practice. For recordkeeping purposes, a sealed copy of the employee records marked as confidential medical records may be submitted to the employer for retention.

WAC 296-857-900, Task and Industry Specific Compliance Protocols

- The following protocols are provided to give industry or task specific information where there is extensive experience indicating exposures can be moderated through standard controls and good work practices.
- These plans do not include requirements in addition to the main portions of this chapter. References are included to the primary requirement, though the protocol may describe the requirement in a manner specific to the task or industry at hand.
- Some of the protocols include safe-harbor provisions. Generally, this is a presumed exposure level which can be used in lieu of direct monitoring for a period of time. If the employer provides personal protective equipment and hygiene facilities consistent with this presumed exposure level and implements the work practices and controls in the model control plan, then direct measurement of exposure may be delayed or unnecessary.
- The model control plan provided here can be used in place of an employer specific plan. Note that the model plan may have

WAC 296-857-90010, Incidental Lead Paint in Construction/RRP Work

- This protocol is for use by contractors and maintenance operations handling lead containing paint. The following assumptions apply to work under this protocol.
    - The work will be done with hand tools or power tools with HEPA filtered dust collection systems.
    - Lead containing paint abatement is not the purpose of the work.
    - The work occurs in residential or similar construction where the primary lead containing material is finish paint. Typically wood construction with some masonry elements. Painted surfaces are on wood or wallboard substrates. Structural steel is not used.
    - Contractors conducting this work are in compliance with the Department of Commerce and Environmental Protection Agency programs and have certification from them when required.
        - This protocol is not intended for use during work for lead abatement work as defined by the Department of Commerce and Environmental Protection Agency.
        - Lead abatement work may involve greater levels of exposure and firms doing this work will typically be required to have a program consistent with permissible exposure limit requirements.
    - Training required for environmental certification will be supplemented with additional information on WISHA rules, particularly for personal protective equipment, respiratory protection, hygiene practices, and work practices.

- The following presumptions are made for lead exposures during incidental lead paint work.

Task	Presumed Exposure Level	Controls and Training	Monitoring requirement
Where lead containing coatings or paint are present: Working around undisturbed lead coatings.	Less than: 10 µg/m³ TWA_{8e}	Basic rules WAC 296-857-200	No monitoring required
Where lead containing coatings or paint are present: Working around disturbed lead coatings.	Greater than: 10 µg/m³ TWA_{8e} Less than: 20 µg/m³ TWA_{8e}	Basic rules WAC 296-857-200 Allow voluntary respirator use when it does not create a hazard.	No monitoring under Compliance Protocol for Incidental Lead Paint Work Otherwise, Initial assessment and initial blood lead level
Where lead containing coatings or paint are present: Manual demolition of structures (e.g., dry wall), manual scraping, manual sanding, heat gun applications, and power tool cleaning with dust collection systems	Greater than: 20 µg/m³ TWA_{8e} Less than: 200 µg/m³ TWA_{8e}	Basic rules WAC 296-857-200 Exposure controls WAC 296-857-300 Respirator APF of 10 or more	No monitoring under Compliance Protocol for Incidental Lead Paint Work Otherwise, Initial assessment and continuing based on level documented. Initial and continuing blood lead levels

- Employers following this protocol must assume paint in structures built before 1978 contains lead in quantities that will require controls and PPE as specified in this protocol. Paint may be tested by collecting samples for laboratory analysis, use of X-ray fluorescence, or following EPA/Department of Commerce rules for colorimetric testing kits. Any paint found to potentially contain 5000 ppm lead or more than 1 mg/cm² of lead on the surface must be treated as a lead containing material under this protocol.

- Require employees disturbing painted surfaces to wear half-face respirators with P100 filters. More protective respirators may be selected. Full face respirators provide eye protection. Workers may request PAPRs with HEPA cartridges. The employer must implement a respiratory protection program as required under Chapter 296-842 WAC, Respirators, including the following items:

    - Identification of a respirator program coordinator

  - Identification of the respirator models and configuration the employer will require for each task performed
  - The process for medical clearance and fit testing of workers

- Provide personal protective equipment including:
  - Safety glasses or goggles (goggles must be used with caustic paint removers and solvents corrosive the eyes), or full face respirators.
  - Disposable overalls or overalls that are laundered per the rule requirements
  - Work boots. For workers scraping or sanding paint, disposable shoe covers or dedicated work boots that are not worn off the worksite.
  - Gloves or a glove combination that provides impermeable protection from lead accumulation on the hands and necessary protection from cuts or other hand hazards.
  - Other personal protective equipment necessary based on other hazards at the worksite.

- Train all workers to the basic level (20020). Work covered under the EPA/Department of Commerce rules must be conducted by workers meeting the minimum training and accreditation standards of that program, with additional training on worker safety issues.
  - Specific training topics:
    - Health effects of lead
    - Respiratory protection
    - Personal protective equipment
    - Work practices specific to the worksite
    - Limits of work practices (not applicable to work on structural steel or other non-residential, light commercial work)

- The site competent person must be able to recognize lead related hazards and have authority to take action to correct lead issues at the worksite.

- Exposure assessment for this work may rely on the presumption that there is exposure to lead at a level no more than 10 times the permissible exposure limit, 20 µg/m³ TWA_{8e}. While this presumption is used, the employer must meet all requirements of the rule consistent with this level of exposure including:
  - Provide baseline blood lead testing for all workers contacting presumed or actual lead containing coatings or in the vicinity of any work disturbing these materials.
  - Establishing lead control areas around any work disturbing presumed or actual lead containing coatings
  - Require respirator use for all workers disturbing presumed or actual lead containing coatings
  - Provide appropriate personal protective equipment

- Providing a clean change area and hygiene facilities (including dedicated handwashing, boot cleaning, and showers as necessary) to allow workers to clean themselves and keep their street cloths clean and lead free.
- Provide follow-up blood lead testing for workers involved with tasks that disturbed presumed or actual lead containing coatings.
- Provide medical exams for workers involved with tasks that disturb presumed or actual lead containing coatings more than 30 days per year.

- Employers may elect to conduct exposure assessments to determine actual lead exposure levels and tailor their program under this protocol as indicated by those results.

WAC 296-857-90020, Gun Range Work

- This compliance protocol is for use by operators of gun ranges. The protocol covers the operation and maintenance of the gun range and has information related to sales and repair of firearms. Establishments working with firearms, but not including a firing range, may also utilize this plan, although they may not need all elements of this protocol

- This plan is intended to cover lead exposure during the majority of work in and around a gun range, but employers must still complement this plan by establishing some specific policies and procedures.
  - Respirator program
    - A voluntary use program may be used for workers doing general housekeeping, brass collection, and training or range safety functions.
    - A required respirator program will be required for workers cleaning the range, servicing the bullet trap, or working with the ventilation equipment.
  - Specific work procedures for the establishment must be put in place for servicing the bullet traps and ventilation systems. If these functions are done by a contractor, the range must have in place contracts or procedures for ensuring contractors are aware of the lead hazard, capable of operating safely in this environment, and have appropriate safety programs in place.

- The following assumptions apply to work under this plan.
  - The range is properly designed and functioning following generally accepted industry standards.
    - Indoor ranges must be ventilated with sufficient air flow at the shooting stations to draw lead containing fume away from the shooter's breathing zone.
    - Outdoor ranges are designed to prevent blocking air flow or creating turbulence at the shooting stations which might keep lead containing fume in the breathing zone of the shooters.

- This plan includes all working and maintenance tasks associated with the gun range. Gun range operators who contract parts of this work or allow other employers to use the range may have limited exposures for their direct employees, but must ensure other employers in the gun range facility are aware of the lead hazards and taking appropriate precautions to protect employees.
- The gun range is separated from sales, training, and gunsmith operations. The range will have a separate entrance and dedicated hygiene facilities.

- The following presumptions are made for lead exposures in a gun range establishment.

Task	Presumed Exposure Level	Controls and Training	Monitoring requirement
Range Master/Range safety officer	Greater than: 10 µg/m³ TWA_{8e} Less than: 20 µg/m³ TWA_{8e}	Basic rules WAC 296-857-200 Allow voluntary respirator use when it does not create a hazard.	Initial assessment and initial blood lead level
Firearms trainer in range	Greater than: 10 µg/m³ TWA_{8e} Less than: 20 µg/m³ TWA_{8e}	Basic rules WAC 296-857-200 Allow voluntary respirator use when it does not create a hazard.	Initial assessment and initial blood lead level
Firing weapons in the range	Greater than: 10 µg/m³ TWA_{8e} Less than: 20 µg/m³ TWA_{8e}	Basic rules WAC 296-857-200 Allow voluntary respirator use when it does not create a hazard.	Initial assessment and initial blood lead level
Firearms trainer in classroom	Less than: 10 µg/m³ TWA_{8e}	Basic rules WAC 296-857-200	No monitoring required
Sales	Less than: 10 µg/m³ TWA_{8e}	Basic rules WAC 296-857-200	Initial blood lead level if work involves metals containing greater than 20% lead.
Loading ammunition	Greater than: 10 µg/m³ TWA_{8e} Less than: 20 µg/m³ TWA_{8e}	Basic rules WAC 296-857-200 Allow voluntary respirator use when it does not create a hazard.	Initial assessment and initial blood lead level

Range housekeeping, pickup spent shells and other debris at shooting stations	Greater than: 10 µg/m³ TWA_{8e} Less than: 20 µg/m³ TWA_{8e}	Basic rules WAC 296-857-200 Allow voluntary respirator use when it does not create a hazard.	Initial assessment and initial blood lead level
Range housekeeping, full clean of range	Greater than: 20 µg/m³ TWA_{8e} Less than: 200 µg/m³ TWA_{8e}	Basic rules WAC 296-857-200 Exposure controls WAC 296-857-300 Respirator APF of 10 or more	No monitoring under Compliance Protocol for Incidental Lead Paint Work Otherwise, Initial assessment and continuing based on level documented. Initial and continuing blood lead levels
Emptying bullet traps	Greater than: 200 µg/m³ TWA_{8e} Less than: 2000 µg/m³ TWA_{8e}	Basic rules WAC 296-857-200 Exposure controls WAC 296-857-300 Respirator APF of 100 or more	Initial assessment and continuing based on level documented. Initial and continuing blood lead levels
Range ventilation service	Greater than: 200 µg/m³ TWA_{8e} Less than: 2000 µg/m³ TWA_{8e}	Basic rules WAC 296-857-200 Exposure controls WAC 296-857-300 Respirator APF of 100 or more	Initial assessment and continuing based on level documented. Initial and continuing blood lead levels
Berm mining	Greater than: 200 µg/m³ TWA_{8e} Less than: 2000 µg/m³ TWA_{8e}	Basic rules WAC 296-857-200 Exposure controls WAC 296-857-300 Respirator APF of 100 or more	Initial assessment and continuing based on level documented. Initial and continuing blood lead levels

- Facility work zones

- Activities in the break areas, sales shop, gun range, and gunsmith sections of the facility must be kept separate.
- Employee break and lunch rooms are to be kept free of lead contamination.
- The sales shop is a lead work area, but no activities that generate airborne lead are allowed in this area, but it is assumed that firearms, other equipment, and work surfaces may be contaminated with lead. Employees must practice appropriate hygiene, particularly diligent hand washing when working in the sales shop.
- The gun range public spaces, including the entrance foyer and any ancillary spaces used by gun range users without decontaminating, are considered lead contaminated. Appropriate hygiene practices are required, particularly hand washing, and employees working primarily in these areas may want to have dedicated range shoes and clothes.
- The gun range service areas, including the bullet trap, including the space immediately in front of it, and ventilation system must be designated as lead control areas and access must be limited to properly trained and equipped range personnel.
- Gunsmith shops and ammunition loading areas are also considered lead control areas. The access to these areas must be limited to properly trained and equipped range personnel. Each control area may have different authorized entrants.

- Housekeeping in clean areas of the facility
  - Break rooms and lunch rooms must be kept free of lead contamination. All accessible surfaces must be maintained with free lead concentrations below 4.3 µg/dm². Other surfaces should be maintained below 43 µg/dm² as practical. Single sample surface sampling of accessible surfaces must be done every six months to ensure surfaces are kept clean.
  - Sales areas must be kept as free as practical of lead contamination. Sampling every six months must be done to make sure lead contamination is being properly controlled. Four sample surface testing can be done to show the lead contamination is being kept to appropriate levels. If the first sample of the set below 4.3 µg/dm², for any set, the remaining three samples do not need to be analyzed. Surfaces found to be consistently over 43 µg/dm² despite effective cleaning, must be replaced or sealed.
  - Public areas of the range must be as free as practical of lead contamination. Sample every three months to make sure lead contamination is properly controlled. Four sample surface testing can be done to show the lead contamination is being kept to appropriate levels. If the first sample of the set is below 4.3 µg/dm², for any set, the remaining three samples do not need to be analyzed. Surfaces found to be consistently over 43 µg/dm² despite effective cleaning, must be replaced or sealed.
  - Cleaning of accessible surfaces must be weekly or more frequently if indicated by sampling. Cleaning of surfaces where firearms or ammunition are handled should be done following each activity or shift.

  - Wet wiping or mopping are the preferred techniques for cleaning. HEPA filtered vacuums can also be used. Cleaning solution or water and the cleaning media need to be changed out regularly to prevent recontamination or spreading of contamination.

- Housekeeping in lead control areas
  - Lead control areas must be tested every three month using the four sample surface testing protocol. If the first sample of the set is below 27 µg/dm², the remaining samples do not need to be analyzed.
  - Counters and other surfaces used for handling firearms and ammunition must be cleaned after each activity or work shift. Use a fresh wet rag or wipe for each cleaning, rinsing or replacing it occasionally.
  - Floors and other accessible surfaces must be mopped or wiped at least weekly using a wet mop.
    - The mop must be rinsed frequently to make sure contamination is not spread. Use two buckets, one with clean water and detergent and a second for squeezing out the mop.
    - Mop the range floor starting with the shooting stations and moving toward the bullet traps.
    - For ranges that allow tactical training (shooting from prone position and moving down the range, rather than using fixed shooting stations), the floor must be mopped before each training session or shift.
  - Mopping machines designed for lead cleanup work, walk behind or riding styles, are effective at reducing lead contaminations and should be considered for larger ranges.

- Employee blood lead monitoring
  - All employees working in any portion of the range, gunsmith shops, or loading ammunition must be offered a blood lead test prior to starting work.
  - Elevated blood lead levels in the pre-work testing should be discussed with the employee to ensure any non-work exposures are controlled. If the employee blood lead level exceeds the blood lead action level, 10 µg/dL, the employee should be asked to review this information with any prior employer.
  - Employees working in gunsmith shops, ammunition loading, or range maintenance and cleaning must be offered blood lead tests every two months for the first six months of employment and every six months after that.

- Control system monitoring
  - Ventilation systems used to control lead in firing ranges must be commissioned under the supervision of a registered professional engineer with expertise in industrial or environmental contaminant control systems.
  - During commissioning, air flow in the range will be checked to make sure it matches the engineering specifications as designed to minimize lead exposure.

- Following commissioning, the registered professional engineer must specify a maintenance program and periodic measurements of the system performance (airflow, pressure, etc). The specification must include target values for correct operation of the system and high and low limits that indicate a problem with the system.
- Following the engineer's schedule, take measurements and record the results. The system and range must be taken out of service if there are readings outside the proper service range until the system is restored to proper function.
- Conduct scheduled maintenance following the engineered program and document maintenance activities.

- Employee exposure monitoring
  - Housekeeping surface sampling checks and ventilation system monitoring provide documentation of exposure levels for the following workers:
    - Sales staff not working in the range or gunsmithing areas
    - Range desk staff
    - Range safety officers and trainers who primarily monitor activity in the range from a control room or by camera.
  - Initial exposure monitoring must be done for range safety officers, trainers, and other personnel who spend more than 4 hours per day in the range, for employees who do target practice or firearm qualifications while working, and for employees doing minor housekeeping in the range, such as collecting brass.
    - For any of these employee groups found have exposures below the monitoring level, 10 µg/m³ TWA_{8e}, the employer may also rely on the housekeeping checks and ventilation system monitoring to determine ongoing exposure.
    - For employees exposed at or above the monitoring level, 10 µg/m³ TWA_{8e}, ongoing monitoring will be necessary following the requirements in WAC 296-857-400, Characterizing and Tracking Employee Exposure. If the range ventilation can be improved to reduce exposures below the monitoring level, then further direct exposure monitoring can be suspended.
    - Further monitoring will be necessary if any changes in firearms, ammunition, training protocols, or ventilation system are made which could increase exposure to lead.
  - Initial and ongoing exposure monitoring must be conducted for employees cleaning the range, servicing the bullet trap, and performing ventilation system maintenance.