



Name: Asbestos Management Plan		
Date Created: June 2008	Date Revised: January 2021	Reviewed By: EHS Staff

INTRODUCTION

Asbestos is a general name for a group of naturally occurring minerals composed of small fibers. Due to its heat and chemical resistance, strength, and durability, asbestos was incorporated into a number of common building materials, including spray-on fireproofing, floor tiles, sheet vinyl flooring, acoustical plaster and textures, pipe and boiler insulation, and roofing materials. These materials were commonly used prior to 1981, when the use of asbestos in manufacturing was phased out in the United States. Portland State University has a number of buildings which were constructed prior to this period and the presence of asbestos-containing materials (ACM) or presumed asbestos-containing materials (PACM) have been documented in some of our buildings by material surveys. Due to the recognized negative health effects of prolonged exposure to airborne fibers, the use, disturbance, and disposal of asbestos is regulated by the Occupational Safety and Health Administration (OSHA) and Oregon Department of Environmental Quality (DEQ).

PURPOSE

The purpose of this Asbestos Management Plan is to provide a template for work practices to encourage appropriate in-place management and minimize the potential exposure to asbestos-containing materials during demolition, maintenance, and renovation activities. This plan is intended as a summary of the OSHA General Industry Standard for Asbestos, 29 CFR 1910.1001 and (https://www.osha.gov/pls/oshaweb/owadisp.show_document?p_table=standards&p_id=9995), and OR-OSHA state-specific requirements for asbestos established by OAR 437, Division 2, Subdivision Z, Asbestos (<https://osha.oregon.gov/OSHARules/div2/div2Z-1001-asbestos.pdf>). There are separate Oregon Department of Environmental Quality regulations for the removal and disposal of asbestos-containing materials, which are applicable for larger scale projects impacting asbestos-containing materials. A list of relevant state and national standards can be found in the Appendix E of this document.

This Asbestos Management Plan shall apply to all employees who have a potential to contact or perform activities involving actions which may disturb ACM, including removal, repair, alteration, or cleaning. This plan shall also be applicable to outside contractors and consultants who provide asbestos related services, or outside contractors providing services that have the potential to incidentally disturb ACM.

RESPONSIBILITIES

Environmental Health and Safety (EHS) – EHS is responsible for providing technical guidance to University employees concerning asbestos hazard evaluation and control, and the implementation of the Asbestos Management Plan, including:

- Obtain and maintain building asbestos surveys for all buildings on campus constructed prior to 1981.
- Implement, train and provide oversight for this Asbestos Management Plan.
- Facilitate collection and laboratory analysis of suspected asbestos-containing material samples as identified by campus maintenance and construction personnel.

- Consult with Campus staff and supervisors to identify and provide the appropriate level of training and personal protective equipment for all staff which may impact asbestos-containing materials.
- Provide technical assistance to construction and maintenance staff regarding development of exposure control work practices and contract specifications.
- Conduct personal exposure monitoring during asbestos related work and associated recordkeeping.
- Oversee medical surveillance program and assist with the selection of appropriate personal protective equipment.

PSU Facility Project Management Teams and Supervisors – Departmental managers and supervisors are responsible for ensuring that all workers are properly trained prior to working with asbestos-containing materials and that work is performed in accordance with this Asbestos Management Plan, including:

- Notify EHS whenever the scope of projects may include disturbing ACM or PACM, and coordinate the collection of material samples from each unique material prior to disturbance;
- Partner with EHS to ensure personal exposure monitoring and medical surveillance are done, as needed;
- Notify EHS if an employee has a health concern related to potential asbestos exposure;
- Ensure all employees who potentially work with and could be exposed to asbestos-containing materials receive the appropriate level of asbestos awareness or operations and maintenance training prior to performing any work that may impact these materials.
- Ensure that all construction and maintenance activities (including those done by contractors) meet OR-OSHA requirements as well as requirements of this plan;
- Provide contractors with the location of asbestos-containing material prior to authorizing any work around the material, as per the Hazard Communication Program.
- Engage only state licensed asbestos abatement contractors for asbestos abatement activities.

PSU Staff and Employees – Employees are responsible for following the procedures outlined in the Asbestos Management Plan, including:

- Attend appropriate initial asbestos awareness or operations and maintenance training and annual refresher trainings as directed by your supervisor and EHS.
- Comply with procedures established in these trainings, or by their supervisors, project managers, EHS, and the contents of this management plan to minimize potential asbestos exposure.
- Inform their supervisor or EHS if they identify a potentially asbestos-containing material they believe should be sampled and analyzed for asbestos content.
- Do not clean, damage, disturb, or remove asbestos-containing materials unless trained and authorized.
- Inform their supervisor or EHS if they identify suspected asbestos debris or damaged asbestos containing materials or if these materials are disturbed or discovered in a damaged state.

External Project Managers, General Contractors, Sub-Contractors, and Asbestos Specific Contractors - Contractors are responsible for ensuring that all workers are properly trained prior to working with asbestos-containing materials and that work is performed in accordance with this Asbestos Management Plan and OR-OSHA regulations, including:

- Do not disturb or intentionally impact any ACM or PACM unless specifically trained and authorized to do so.
- Ensure all employees working on PSU projects involving impacting of asbestos-containing materials are properly trained in accordance with this Asbestos Management Plan and appropriate federal, state, and local regulations.
- Inform PSU representatives if suspected asbestos-containing materials are encountered so the material can be sampled and analyzed for asbestos content.

- Stop work immediately and contact the assigned Project Manager or EHS if a previously unidentified ACM or PACM is discovered in a damaged state or was accidentally disturbed.
- Communicate hazards related to asbestos work to all other trades and subcontractors on a project site.
- Provide the Project Manager and/or EHS representatives with a copy of all air clearance sample results once they are obtained. Post air clearance documents at work sites before subsequent phases of non-asbestos work begin.
- Collect and manage hazardous wastes produced in accordance with Resource Conservation and Recovery Act (RCRA) hazardous waste requirements.

TRAINING

Training is required for all employees who perform OSHA Class I through IV asbestos work, which must meet the requirements of the EPA Model Accreditation Plan. No student workers or untrained workers are to disturb any amount of asbestos. PSU trains its facilities personnel and janitorial staff to the Class III and Class IV level respectively and contracts all Class I or Class II asbestos removal to state licensed asbestos abatement companies. The following are the basic training requirements for the different types of asbestos work:

Class I and Class II asbestos work involves the removal of thermal system insulation (TSI) and surfacing ACM and PACM (Class I) or other materials (Class II), such as wallboard, floor tile and sheeting, roofing and siding shingles, and construction mastics. Training for Class I and Class II work is either 32 hours (asbestos worker), or 40 hours (contractor/supervisor and function as a competent person). PSU does not currently support Class I or Class II asbestos work in-house and all qualifying abatement work is performed by contractors.

Class III asbestos work involves repair and maintenance operations (O&M) of up to 3 square feet or 3 linear feet of ACM, including thermal system insulation (TSI) and surfacing ACM and PACM, may be disturbed. Training for Class III (O&M) work is initially 16 hours with an annual 4-hour refresher course. PSU facilities staff and construction members who work with and have the potential to disturb ACM or PACM during their work operations shall be trained to the OSHA Class III level.

Asbestos Awareness Training / Class IV asbestos work involves maintenance and custodial activities during which employees have a potential contact with but do not disturb ACM and PACM. Training for custodial and maintenance personal that may work around ACM but do not disturb the material shall be, at a minimum, a 2-hour asbestos awareness class that meets the training requirements established by the OSHA asbestos regulations (29 CFR 1226.1101) for Class IV training. PSU's in-house and contracted custodial staff should be trained to the OSHA Class IV level. Additionally, staff and student workers who have a potential contact with and/or conduct activities which may impact ACM shall be provided with asbestos awareness training.

For additional information regarding the different Classes (I – IV) of asbestos work and the associated training, personal protection, work practices, and documentation, please consult Appendix C: Requirements for Appropriate Asbestos-Related Work Procedures, Protection, and Documentation.

HAZARD IDENTIFICATION AND RECORDKEEPING

Asbestos Building Surveys / Supplemental Material Assessment

PSU EHS maintains surveys of asbestos content in building materials for all PSU owned public access buildings. These surveys are kept in electronic format and are available for review for all PSU staff, personnel, and occupants working on and within these buildings. Prior to the onset of a construction, remodel, or renovation project, employees, project managers, and supervisors shall consult these building surveys in order to determine if the affected building material has been previously sampled and is

considered to be ACM or PACM. Employees shall contact their supervisor or a member of EHS staff for access to an electronic or hard copy of these building surveys.

In the event that historical data cannot be identified, or confirmatory sample analysis is desired for a material, additional samples shall be collected for laboratory analysis. Bulk building material samples shall be collected by an Asbestos Hazard Emergency Response Act (AHERA) accredited building inspector. PSU's EHS department employs staff members with applicable AHERA certifications. All samples shall be delivered under chain-of-custody documentation to a National Voluntary Laboratory Accreditation Program certified analytical laboratory. Analytical results shall be shared with all interested parties and results shall be archived for future review.

Work Area Isolation and Regulated Area Signage

Project supervisors shall post a sign containing the following words to establish a regulated area for every job that potentially results in personal exposures at or above the PEL or anytime an exposure assessment has not been conducted for the work practice or materials involved.

**Danger
Asbestos
May Cause Cancer
Causes Damage to Lungs
Authorized Personnel Only**

These signs will be posted at each entrance to a regulated area and at least 10 feet from any activity which disturbs ACM. PPE is required for entry into a regulated area. A printable copy of a warning sign is located in Appendix F.

Warning Signs for Mechanical Rooms

Mechanical and boiler rooms where employees may be expected to routinely enter and work with material known to contain ACM or PACM must be posted with warning signs. These signs must be placed at each entrance to the room, and be clearly visible so that an entrant would be warned of the materials located in the area. In addition, there will be a list of materials located in the space which contain asbestos. Facilities personnel and project managers are responsible for informing all new staff and contractors to the location and contents of the mechanical room signs and ACM material list and ensure that proper protocols are in place to limit damage to ACM. Project Managers conducting abatement and/or construction activities in mechanical rooms must ensure the integrity of these signs and must have these signs updated to reflect any changes in information content subsequent to project activities. If signs are found to be missing or damaged, contact EHS for replacement.

EXPOSURE CONTROL PROCEDURES:

Initial Exposure Assessments

During Class III asbestos removal operations, initial exposure assessment shall be performed, unless a negative exposure assessment has been obtained for the work to be performed, in order to document that the chosen personal protective equipment and engineering controls are sufficient to prevent workers from being exposed to fiber concentrations which exceed OSHA's permissible exposure limit (PEL) and Short Term Exposure Limit (STEL). This monitoring typically consists of samples from the breathing zones of employees performing the work, with laboratory analysis by phase-contrast microscopy using the NIOSH 7400 Method to ensure that airborne fiber levels are well within regulatory limits for the level of PPE employed. All results from personal exposure monitoring will be provided to both the employee and their supervisor within 5 days of receiving laboratory results. If levels exceed the PEL, the EHS report will include steps and controls to reduce exposure to below the PEL. Follow up exposure monitoring may be necessary if engineering or administrative controls are put in place to reduce hazardous exposures. Records of all exposure assessments and personal air samples will be archived by PSU EHS for a period of time at least 30 years past the last date of employment of the affected employee.

Negative Exposure Assessments

A Negative Exposure Assessment (NEA) is a demonstration by an employer that an employee's exposure is consistently below the PEL and STEL. A negative exposure assessment is job specific and the type and amount of material, asbestos type and percent by weight, control methods, work practices, and environmental conditions be similar to future projects for the NEA to be used to characterize future exposure potentials. The assessment can be used to show that exposure levels for a given job will be below the PEL so that lower levels of personal protective equipment (PPE) can be used. A NEA must rely on data collected within the previous 12 months and performed on similar work conditions and materials.

Personal and Respiratory Protective Equipment – Hygiene Practices

For all Class III asbestos work performed by PSU employees, PPE selection shall be in compliance with the requirements outlined by the guidance material associated with this training. These materials may include a half-face air purifying respirator, disposable coveralls with booties, disposable gloves, and eye protection. All appropriate PPE are to be provided by PSU at no cost to the employee. Please contact your supervisor if the appropriate PPE is not available through Facilities' Stores. Contractors are responsible for providing their own PPE. For certain routine work practices, a negative exposure assessment may be performed in order to re-evaluate appropriate PPE to a lower level. These determinations shall be performed by EHS staff with assistance by appropriate facilities field staff. Disposable gloves and handwashing practices shall be used for all projects even if a negative exposure assessment has been performed and determined that the permissible exposure limit and/or excursion limit are not likely to be exceeded. Employees who may be required to wear respirators must be enrolled in PSU's Respiratory Protection Program.

PPE shall be worn within the regulated work areas. In addition, employees and supervisors shall ensure that a changing area is provided for putting on and removing PPE, employees do not eat or drink, use tobacco products or apply cosmetics in the work area and wash their hands prior to use, and that all PPE is removed prior to exiting the work area and bagged for disposal as asbestos-containing waste.

Housekeeping and Debris Collection Practices

All surfaces shall be maintained as free as practicable of ACM waste, debris, and accompanying dust. Unacceptable methods of asbestos-containing debris collection include dry sweeping, vacuum cleaners or shop vacuums without HEPA filtration, and compressed air. Use of these unacceptable methods may result in personal exposures to asbestos.

Surfaces contaminated with asbestos may not be cleaned using compressed air. Do not drill holes, hammer nails into, hang objects from, or move furniture that damages ACM or PACM. Waste, debris, and accompanying surface dust in areas containing accessible and/or visibly deteriorated ACM, shall only be cleaned by trained personnel using wet methods and HEPA filtered vacuum methods.

All vinyl and asphalt flooring shall be treated as ACM unless evidence exists to prove otherwise. The following restrictions exist for the care of ACM flooring: no sanding is permitted, stripping shall be conducted using low abrasion pads at speeds lower than 300 rpm with wet methods, and burnishing or dry buffing may be performed only on flooring which has sufficient finish so the pad doesn't contact the flooring material. Broken ACM floor tiles shall only be removed by properly trained personnel.

Ceiling tiles shall not be moved or replaced until it is confirmed that they are not ACM. In buildings where spray-applied surfacing materials are known to exist above drop ceilings, tiles shall be inspected for debris and, if present, shall be decontaminated before they are disturbed to insure that ACM debris is not spread to the underlying areas. Only trained personnel can replace, decontaminate, or otherwise disturb ACM ceiling tiles or tiles that may be contaminated by ACM surfacing material above.

Waste Collection

All asbestos-containing waste material generated during work practices shall be collected and provided to EHS for disposal, or placed into 55-gallon poly drums located on campus. This includes ACM debris, drop

cloths, containment plastic, glove bags, and disposable coveralls and gloves. Debris shall be collected into sturdy plastic bags (6-mil poly bags are recommended) and labeled as "Hazardous Waste – Asbestos Debris" with a date and location of collection and provided to EHS for disposal. For larger projects lasting multiple days, EHS can provide a larger container to use as an on-going collection site. Please contact EHS prior to the start of larger projects to arrange details. No debris or contaminated PPE shall leave the work area unless properly labeled and contained in plastic.

Responding to Unintentional Asbestos Material and Fiber Release Events

A fiber release event is any uncontrolled or unintentional disturbance of asbestos-containing materials resulting in a release of asbestos-containing debris. Additional guidance on ACM debris clean-up can be found in Appendix G. In the event of any asbestos fiber release episode the following procedures shall be immediately followed:

- Notify untrained occupants to vacate area until clean-up is complete and close doors or otherwise restrict access to affected area. Isolate the area with a physical barrier or signage to prevent untrained and unprotected persons from entering the area, potentially exposing themselves, or spreading the disturbed material. If possible, have someone remain in the area to prevent these from occurring.
- Notify HVAC personnel to disarm the return air system in the area to prevent released fibers from entering the return air plenum.
- If trained and qualified to do so (Class III O&M Training), clean up small material releases using wet methods and High Efficiency Particulate Air (HEPA) filtered vacuums.
- If not trained or qualified to do so, notify the supervisor on the project and EHS for assistance. Larger fiber release events may require the employment of abatement personnel to perform a level of decontamination not supported by PSU staff.

MEDICAL MONITORING:

For employees required to wear an air purifying respirator, an initial medical determination shall be made to ensure employees are physically able to perform the work and wear a respirator. This determination is performed by Kaiser Permanente's Occupational Health Services department at the North Interstate campus. Medical history questionnaires and the associated paperwork for enrolling in PSU's respiratory protection program are available from PSU's EHS department. In many instances, a desktop review by a medical professional of past health history is enough for medical clearance for respirator use. In other occasions, additional testing of lung function and/or chest x-rays may be requested by the medical professional. All employees who are engaged in asbestos-related work and who are suspected of or documented as having a total of more than 30 days per year of exposure above permissible exposure limits shall be enrolled in a medical surveillance program. All medical records for employees that have either worked with asbestos on campus, or may have been adversely exposed will be maintained by Human Resources for a period of 30 years plus after employment.

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Appendix A: Definitions

- **Aggressive method** means removal or disturbance of building material by sanding, abrading, grinding or other method that breaks, crumbles, or disintegrates intact ACM.
- **Aggressive Final Clearance** means a final collection of air samples where floors, ceiling, and walls are swept with the exhaust of a one (1) horsepower leaf blower to dislodge any remaining dust and stationary fans are used (one for each 10,000 ft³ of worksite) to direct air toward the ceiling to create a “worst case” sampling scenario.
- **Amended water** means water to which surfactant (wetting agent) has been added to increase the ability of the liquid to penetrate ACM.
- **Asbestos** includes chrysotile, amosite, crocidolite, tremolite asbestos, anthophyllite asbestos, actinolite asbestos, and any of these minerals that has been chemically treated and/or altered. For purposes of this standard, asbestos includes PACM, as defined below.
- **Asbestos-containing material (ACM)**, means any material containing more than one percent asbestos.
- **Class I asbestos work** means activities involving the removal of thermal system insulation and surfacing ACM and PACM.
- **Class II asbestos work** means activities involving the removal of ACM which is not thermal system insulation or surfacing material. This includes, but is not limited to, the removal of asbestos-containing wallboard, floor tile and sheeting, roofing and siding shingles, and construction mastics.
- **Class III asbestos work** means repair and maintenance operations, where ACM, including TSI and surfacing ACM and PACM, is likely to be disturbed.
- **Class IV asbestos work** means maintenance and custodial activities during which employees contact but do not disturb ACM or PACM and activities to clean up dust, waste and debris resulting from Class I, II, and III activities.
- **Critical barrier** means one or more layers of plastic sealed over all openings into a work area or any other similarly placed physical barrier sufficient to prevent airborne asbestos in a work area from migrating to an adjacent area.
- **Decontamination area** means an enclosed area adjacent and connected to the regulated area and consisting of an equipment room, shower area, and clean room, which is used for the decontamination of workers, materials, and equipment that are contaminated with asbestos.
- **Disturbance** means activities that disrupt the matrix of ACM or PACM, crumble or pulverize ACM or PACM, or generate visible debris from ACM or PACM.
- **Employee exposure** means that exposure to airborne asbestos that would occur if the employee were not using respiratory protective equipment.
- **Enclosure** means an airtight, impermeable barrier designed to prevent the release of asbestos fibers into the air.

- **Environmental Protection Agency (EPA)** is an agency of the U.S. federal government which was created for the purpose of protecting human health and the environment by writing and enforcing regulations based on laws passed by Congress.
- **Fiber** means a particulate form of asbestos, 5 micrometers or longer, with a length-to-diameter ratio of at least 3 to 1.
- **Friable** means material that when dry, may be crumbled, pulverized, or reduced to powder by hand pressure.
- **Glovebag** means a no larger than 60 inch by 60 inch impervious plastic bag-like enclosure affixed around an asbestos-containing material, with glove-like appendages through which material and tools may be handled.
- **High-efficiency particulate air (HEPA) filter** means a filter capable of trapping and retaining at least 99.97 percent of all mono-dispersed particles of 0.3 micrometers in diameter.
- **Intact** means that the ACM has not crumbled, been pulverized, or otherwise deteriorated so that the asbestos is no longer likely to be bound with its matrix.
- **Negative Initial Exposure Assessment** means a demonstration by the employer that employee exposure during an operation is expected to be consistently below the PELs.
- **PACM** means presumed asbestos containing material.
- **Permissible Exposure Limit (PEL)** is the maximum allowable exposure to asbestos at 0.1 fibers per cubic centimeter of air as an eight (8) hour time-weighted average
- **Regulated area** means: an area established by the employer to demarcate areas where Class I, II, and III asbestos work is conducted, and any adjoining area where debris and waste from such asbestos work accumulate; and a work area within which airborne concentrations of asbestos, exceed or there is a reasonable possibility they may exceed the permissible exposure limit.
- **Surfacing material** means material that is sprayed, troweled-on or otherwise applied to surfaces (such as acoustical plaster on ceilings and fireproofing materials on structural members, or other materials on surfaces for acoustical, fireproofing, and other purposes).
- **Surfacing ACM** means surfacing material which contains more than 1% asbestos.
- **Thermal system insulation (TSI)** means ACM applied to pipes, fittings, boilers, breeching, tanks, ducts or other structural components to prevent heat loss or gain.

Appendix B:

Partial List of Potentially Asbestos-Containing Materials

- Cement Pipes
- Cement Wallboard
- Cement Siding
- Asphalt Floor Tile
- Vinyl Floor Tile
- Vinyl Sheet Flooring
- Flooring Backing
- Construction Mastics (floor tile, carpet, ceiling tile, etc.)
- Acoustical Plaster
- Decorative Plaster
- Textured Paints/Coatings
- Ceiling Tiles and Lay-in Panels
- Spray-Applied Insulation
- Blown-in Insulation
- Fireproofing Materials
- Taping Compounds (thermal)
- Packing Materials (for wall/floor penetrations)
- High Temperature Gaskets
- Laboratory Hoods/Table Tops
- Laboratory Gloves
- Fire Blankets
- Fire Curtains
- Elevator Equipment Panels
- Elevator Brake Shoes
- HVAC Duct Insulation
- Boiler Insulation
- Breaching Insulation
- Ductwork Flexible Fabric Connections
- Cooling Towers
- Pipe Insulation (corrugated air-cell, block, etc.)
- Heating and Electrical Ducts
- Electrical Panel Partitions
- Electrical Cloth
- Electric Wiring Insulation
- Chalkboards
- Roofing Shingles
- Roofing Felt
- Roll Roofing
- Roof Patching Cement
- Base Flashing
- Thermal Paper Products
- Fire Doors
- Caulking/Putties
- Adhesives
- Wallboard
- Joint Compounds
- Vinyl Wall Coverings
- Spackling Compounds

Note: This list does not include every product/material that may contain asbestos. It is intended as a general guide to show which types of materials may contain asbestos.

Appendix C: Requirements for Appropriate Asbestos-Related Work Practices, Protection, and Documentation.

Provision	Class I *	Class II *	Class III	Class IV
Definition	Removal of thermal system insulation (TSI) and surfacing materials that have been sprayed or troweled on. TSI also includes ACM applied to pipes, boilers, tanks, and ducts.	Removal of all other asbestos not thermal insulation or surfacing materials, such as floor or ceiling tiles, siding, or roofing.	Maintenance and repair operations involving intentional disturbance of ACM or PACM.	Maintenance and custodial activities in which contact with ACM may occur, including dusting surfaces, vacuuming, mopping, or cleaning up ACM containing materials from unintentionally damaged TSI or surfacing.
Competent Person	Required on Site – Contractor and DEQ Supervisor Training Required	Required on Site – DEQ Supervisor and Training Required	OSHA Operations and Maintenance Training Required	OSHA Operations and Maintenance Training Required
Air Monitoring	Initial or Daily if no Negative Exposure Assessment (NEA) determining values are below the permissible exposure limit (PEL)	Initial or Daily if no NEA	Initial if no NEA. Periodically to accurately predict if exceeds PEL. Terminate if below PEL	Not Required
Medical Surveillance	Required if wearing negative pressure respirator and over the PEL for 30 days per year.	Required if wearing negative pressure respirator and over the PEL for 30 days per year.	Required if wearing negative pressure respirator and over the PEL for 30 days per year.	Required if wearing negative pressure respirator and over the PEL.
Respirators	Mandatory for all Class I jobs	Mandatory if Nonintact removal, no NEA, conditions exceed PEL, dry removal, or in emergencies	Half-mask air-purifying respirator minimum if no NEA, thermal insulation or surfacing materials disturbed, or conditions exceed PEL. Mandatory in emergency response to impacted asbestos.	Mandatory if in regulated area where required, conditions are over the PEL, or in emergencies.
Protective Clothing and Equipment	Required for all jobs if over 25 linear feet or 10 square feet of thermal insulation or surfacing materials removed or if no NEA or conditions exceed the PEL	Required for all jobs is no NEA or conditions exceed the PEL	Required for all jobs if no NEA or conditions exceed the PEL	Required for all jobs if no NEA or conditions exceed the PEL

Provision	Class I *	Class II *	Class III	Class IV
Training	Equivalent to AHERA Supervisor / Worker Training	Equivalent to AHERA Supervisor / Worker Training	AHERA 16-Hour Operations and Maintenance Course	AHERA awareness training
Decontamination Procedure	Full decon unit if over 25 linear or 10 square feet of thermal insulation or surfacing materials removed with connected shower / clean room or vacuum, change, and shower elsewhere procedures.	If over PEL or no NEA: Equipment room / area required, drop cloths, decontaminate or throw away (as ACM debris) all PPE, enter regulated area through equipment or decon area. Must vacuum affected areas.		
Required Work Practice / Engineering Controls	Wet methods, HEPA vacuum, prompt cleanup and disposal at authorized landfill			
Required work practices and engineering controls to comply with areas exceeding the PEL	Negative pressure enclosure HEPA filtration, directed ventilation, Supplement with respirators			
Prohibited Work Practices and Engineering Controls	Dry sweeping, compressed air without capture device, high speed abrasive equipment without HEPA capture			
Controls and Work Practices	Critical barriers and isolation methods required if over 25 linear or 10 square feet of thermal insulation or surfacing materials is removed, negative pressure enclosure with HEPA filtration, drop cloths, directed ventilation	Critical barriers and isolation methods required if: no NEA, PEL exceeded, nonintact removal.	See required work practices and controls	

* Portland State University does not employ Department of Environmental Quality certified asbestos abatement workers. Information regarding Class I and Class II work is included for reference when supervising or overseeing work done by asbestos abatement contractors.

Appendix D:

Best Management Practices for Material Removal, Standard Operating Procedures, and Exposure Assessment Results for ACM Removal

April 17, 2018

Standard Operating Procedures (SOP)
and
Negative Exposure Assessment

Fastening materials to walls, ceilings, or flooring which are known or suspect asbestos-containing materials (ACM)

When surfaces which are known or suspected to contain asbestos will be impacted by fasteners (ie. screws, bolts, anchors, etc.), employees shall follow the following steps in order to limit damage to the material and potential for asbestos exposure. Only staff which are current with their 16-hour Asbestos O&M training should perform or supervise this type of work. The default level of personal protective equipment (PPE) shall always be half-face air purifying respirator with disposable coverall protection. Only in cases where previous exposure assessments have been performed and determined that exposure was consistently below the permissible exposure limit (PEL) can PPE be scaled down (Table 2). See Table 1 below for a list of recommended PPE and a relevant equipment materials list. Please contact EHS if you have questions about this SOP or PPE selection.

- Isolate the work environment to ensure that unauthorized persons do not enter the area during work, using warning signs and/or barrier tape indicating asbestos hazard / restricted area. When possible, schedule work when occupants are not likely to be present in the vicinity.
- Install disposable plastic drop sheets under work areas in such a manner to extend at least 2 feet beyond the anticipated extent of material impact and in such a manner to collect any dust which may be generated.
- Utilize local-exhaust HEPA filtration (department designated drill shroud, or vacuum with HEPA filter for ACM) in conjunction with electric drill set which has been dedicated for asbestos-related work.
- Place small (1" x 1") piece of duct or gaffers tape over area of ACM to be impacted and/or wet impacted area with amended (soapy) water. Do not use water if HEPA filter is not compatible with wet vac usage.
- Proceed with drilling and mounting material, using care to collect all dust generated during work with HEPA filter units. When mounting is complete wipe down remaining wetting agent, debris generated during drilling, or material that fell to drop cloth with disposable rags or collect with the HEPA vacuum. Spray debris off drill bits into 2 millimeter (mil) thick (or greater) trash bags.
- Collect all waste material which could be contaminated with ACM and double bag in 2 mil or greater plastic bags. Label bags as asbestos waste with the date and provide to EHS for collection and proper disposal.
- If used, provide EHS with personal air monitoring pumps and cassettes. When received, update exposure monitoring results on Table 2 below.

Signed,



Tim Wright, Environmental Health and Safety

Appendix E:

List of Applicable Regulations and locations for Review of Regulatory Guidance Documents, Standards, and Letters of Interpretation

This Asbestos-Containing Materials Management Plan has been developed in order to comply with various applicable local, state, and federal regulations, including those listed below. For additional information related to the individual regulations, consult the complete documents, as listed below.

Asbestos for General Industry:

- Oregon-OSHA OAR 437-002-1910.1001 ,
<http://osha.oregon.gov/OSHARules/div2/div2Z-1001-asbestos.pdf>
- Federal OSHA 29 CFR 1910.1001,
https://www.osha.gov/pls/oshaweb/owadisp.show_document?p_table=standards&p_id=9995

Asbestos for Construction Industry:

- Oregon-OSHA OAR 437-003-1926.1101,
<http://osha.oregon.gov/OSHARules/div3/div3Z.pdf#page=33>
- Federal OSHA 29 CFR 1926.1101,
https://www.osha.gov/pls/oshaweb/owadisp.show_document?p_table=STANDARDS&p_id=10862

National Emissions Standards for Hazardous Air Pollutants (NESHAP): 40 CFR 61, Subpart M,
<https://www.epa.gov/asbestos/asbestos-national-emissions-standard-hazardous-air-pollutants-neshap>

Oregon Department of Environmental Quality, Oregon Administrative Rule OAR 340-248-0005
http://arcweb.sos.state.or.us/pages/rules/oars_300/oar_340/340_248.html

Environmental Protection Agency Asbestos Reference Document:

- Guidance for Controlling Asbestos-Containing Materials in Building, EPA Purple Book,
https://www.colorado.gov/pacific/sites/default/files/AP_ASB_EPA-Purple-Book.pdf
- Managing Asbestos in Place, A Building Owners Guide to Operations and Maintenance Programs for Asbestos-Containing Materials, EPA Green Book,
<https://nepis.epa.gov/Exe/ZyNET.exe/20011E4D.TXT?ZyActionD=ZyDocument&Client=EPA&Index=1986+Thru+1990&Docs=&Query=&Time=&EndTime=&SearchMethod=1&TocRestrict=n&Toc=&TocEntry=&QField=&QFieldYear=&QFieldMonth=&QFieldDay=&IntQFieldOp=0&ExtQFieldOp=0&XmlQuery=&File=D%3A%5Czyfiles%5CIndex%20Data%5C86thru90%5CTxt%5C00000014%5C20011E4D.txt&User=ANONYMOUS&Password=anonymous&SortMethod=h%7C-&MaximumDocuments=1&FuzzyDegree=0&ImageQuality=r75g8/r75g8/x150y150g16/i425&Display=hpfr&DefSeekPage=x&SearchBack=ZyActionL&Back=ZyActionS&BackDesc=Results%20page&MaximumPages=1&ZyEntry=1&SeekPage=x&ZyPURL>

Appendix F:

Asbestos Warning Signs for Regulated Areas



DANGER



ASBESTOS

MAY CAUSE CANCER

CAUSES DAMAGE TO LUNGS

AUTHORIZED PERSONNEL ONLY

Appendix G:

Asbestos Fiber Release Response Procedures

Special procedures should be followed in order to minimize the spread of asbestos fibers and personal exposures after a fiber release occurs. When areas of potentially asbestos-containing debris are discovered, the following procedures should be followed in order to limit the spread and potential exposure to asbestos material.

Generally, material releases with less than 3 square feet or 3 linear feet of asbestos-containing material are considered a minor fiber release and can be cleaned up by staff with 16-hour O&M training with appropriate respiratory protection. Major fiber releases are larger than 3 square or 3 linear feet should be addressed by a licensed asbestos abatement firm once the area is isolated by PSU staff.

Portions of this guidance have been pulled from EPA's Asbestos Information Page: <https://www.epa.gov/asbestos/safe-work-practices#fiberrelease>:

Minor Fiber Release Episodes

A minor fiber release episode is one in which less than 3 square feet or 3 linear feet of asbestos containing material is dislodged. Minor fiber releases can be treated with standard wet cleaning and HEPA vacuum techniques by PSU staff who are current with their 16-hour O&M asbestos training and EHS's respiratory protection program.

Procedures for Control:

- The person discovering the fiber release should alert their supervisor and/or representatives of EHS in order to identify any assistance or materials that may be necessary or if breathing zone air samples should be collected to document any potential exposure to the workers.
- Effort should be made to move all untrained or non-essential personnel out of the area in order to facilitate the clean-up operations. If possible, notify HVAC staff and request that the ventilation in the area be turned off in order to limit further dispersal of debris material.
- If possible, one worker should stay at the location of the fiber release, and another worker should retrieve the following:
 - Warning signs.
 - Personal respirators and disposable suits for both workers.
 - Amended water (1 cup dishwashing detergent to 5 gallons water).
 - HEPA vacuum.
 - Clean rags.
 - 6 mil plastic bags with asbestos waste labels.

- Any repair materials that may be necessary as a result of the fiber release.
 - Personal air pump and filter cassette (if monitoring will be performed).
- If an initial exposure assessment has not been performed on a particular type of debris clean-up, workers should assume that there may be an asbestos exposure concern and wear personal protective equipment, including disposable coveralls, half-face respirator with particulate filter, gloves, and eye protection.
 - Thoroughly saturate the debris using the sprayer and amended water. Use caution in areas where leaking may occur or finishes may be damaged.
 - Place the debris in the labeled 6 mil plastic bag for disposal.
 - HEPA vacuum all surrounding areas, including floors, fixtures, and other surfaces, at least 6 feet around the edges of the fallen debris.
 - For all hard surfaces, wipe the area with a wet rag; for all carpets or permeable surfaces, perform HEPA vacuuming a second time.
 - If the ACM or other area requires repair, perform the repair.
 - Carefully remove the disposable suit and place the suit in an asbestos disposal bag.
 - Clean all tools and materials or place them into disposable bags for future decontamination. Place all rags and permeable materials in the asbestos waste bag.
 - Remove the respirator and clean with a damp cloth, placing the cloth in the asbestos disposal bag.
 - Double bag the disposal bag with another 6 mil plastic bag labeled as asbestos waste. Arrange with EHS to transport the asbestos material to a collection area or to a defined location where EHS will remove it. Generally, asbestos waste material is collected in a white storage cabinet outside the West Heating Plant prior to transport to the Hillsboro landfill.

Major Fiber Release Episodes

A major fiber release episode is one in which more than 3 square feet or 3 linear feet of friable asbestos containing material is dislodged. Major fiber release episodes typically require that licensed and certified asbestos contractors be employed to clean-up and decontaminate the area. In the event that a major fiber release episode is discovered, the following procedures should be followed in order to minimize the potential for exposure to personnel in the vicinity and to begin the process of clean-up.

- One of the persons discovering the fiber release should immediately alert their supervisor and/or a representative with EHS.
- If the area is an occupied space, notify the occupants of the potential for an airborne asbestos fiber release and suggest that they move away from the area until clear for re-occupancy by PSU staff. Personnel should not take any items out of the area that are contaminated or potentially contaminated from the material release.
- The area should be isolated as soon as non-essential personnel have left. Doors

to the potentially contaminated area should be closed and locked and if possible, signs should be placed at all entrances stating that the area is closed, stating the extent of closure, date, time, and contact name and number for the responding parties, EHS representative, or CPSO if they have become involved in the isolation of the area. Signs should include relevant hazard information, such as:

**"DANGER
ASBESTOS
MAY CAUSE CANCER
CAUSES DAMAGE TO LUNGS
AUTHORIZED PERSONNEL ONLY
FOR INFORMATION, CONTACT XXX AT**

- Notify HVAC personnel to disarm the return air system in the area to prevent released fibers from entering the return air plenum. Document what time the system is shut down, if applicable.
- If additional help with isolation of the potentially contaminated area is required, contact PSU's CPSO and request assistance.
- Once the area is isolated and has appropriate signage, stay in the area until a supervisor or representative with EHS is on-site and assumes control of the area. Once free to do so, create a timeline of events such that a potential exposure log can be created in the future.

If a large scale material release is discovered outside of regular staff hours, contact CPSO and request that dispatch contact EHS's "On-Call" phone number to request assistance from EHS staff. Additionally, make efforts to contact HVAC staff to attempt to isolate the area from the ventilation system.