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## **ASBESTOS MANAGEMENT PROGRAM**

REVISED AND DISTRIBUTED BY:  
THE UNIVERSITY OF VERMONT  
PHYSICAL PLANT DEPARTMENT  
TRAINING & COMPLIANCE OFFICE

(PENDING) REVIEWED BY:  
THE UNIVERSITY OF VERMONT  
COMPLIANCE AND PRIVACY SERVICES  
AND  
RISK MANAGEMENT & SAFETY DEPARTMENT

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## 1. INTRODUCTION

### 1.1 BACKGROUND AND PURPOSE

Asbestos-containing materials (ACM) have been used widely in the construction industry throughout the 20<sup>th</sup> century. Currently there is NOT an outright ban on use of asbestos in most products. Although use of asbestos has been significantly reduced in most products, there are many products and materials still made intentionally and unintentionally with asbestos. The United States Environmental Protection Agency (USEPA) has defined ACM as materials containing greater than 1% asbestos content. The Occupational Safety and Health Administration (OSHA) is concerned with any quantity of asbestos.

The University of Vermont (UVM) has identified in its construction specifications that NO newly-installed products shall contain asbestos. UVM under the direction of Physical Plant's Training & Compliance Office (TCO) has removed significant quantities of ACM from its campus. ACM is still present in older building materials. Occasionally, we find products containing asbestos that are not building materials in older laboratories as well. The TCO maintains the remaining Asbestos Containing Building Materials (ACBM) in good condition. It is unlikely to be disturbed in a manner that fibers may become airborne, causing exposure and health risks.

Accordingly, the purpose of this Asbestos Management Program (AMP) is to describe a plan of action for **identifying, controlling** and **abating** potential asbestos hazards at UVM. The program is consistent with and describes requirements for the management of ACM or Presumed Asbestos Containing Materials (PACM) balancing federal and state regulatory guidelines to ensure the most efficient and cost effective to manage asbestos safely while providing a workplace free from recognized hazards. Much of the guidance for managing ACM is outlined in the most current editions of ASTM standards - E1368 - Standard Practice for Visual Inspection of Asbestos Abatement Projects and - E2356 - Standard Practice for Comprehensive Building Asbestos Surveys. These standards are industry consensus standards.

### 1.2 OVERVIEW

“Clean Air Act” (CAA), is responsible for protecting and improving the nation’s air quality and the stratospheric ozone layer, and includes provisions for the USEPA to set National Emission Standards for Hazardous Air Pollutants (NESHAP), including asbestos. In 1986, Congress promulgated the Asbestos Hazard Emergency Response Act (AHERA), which mandated that EPA develop regulations to respond to asbestos in schools. EPA responded with the Asbestos-Containing Materials in Schools Rule, 40 CFR Part 763, and Subpart E. The rule required that all public and private nonprofit elementary and secondary schools inspect school buildings for asbestos, develop a plan for managing the asbestos, notify parents and staff regarding the management plan, and provide asbestos awareness training to school maintenance and custodial workers. While UVM is a post-secondary school, and the AHERA rule does not apply to the institution, otherwise the rule does provide general guidance for managing asbestos in an institutional setting.

The Asbestos School Hazard Abatement Reauthorization Act (ASHARA) directed USEPA to increase the number of training hours required for the training disciplines under the Asbestos Model Accreditation Plan (MAP) and to expand the accreditation requirement to cover asbestos abatement projects in all public and commercial building, in addition to schools. The US EPA, under the In addition, federal occupational regulations identify requirements regarding occupational exposures to asbestos in all industries covered by the Occupational Safety and Health Administration (OSHA) which encourages states to create their own safety and health programs.

OSHA approves and monitors state plans. Vermont has an approved state plan (VOSHA), which is more stringent than federal OSHA.

The Vermont Department of Health has established notification requirements, procedures for emission control, air cleaning and waste disposal related to handling, transporting, storing and disposing of asbestos-containing material or waste under the Vermont Regulations for Asbestos Control (VRAC) V.S.A. Title 18, Chapter 26 effective February 1987, Amended 1995. The Vermont Agency of Natural Resources (ANR) regulates the transportation and disposal of asbestos through the Vermont Department of Environmental Conservation (DEC). VOSHA, VDH, DEC and USEPA's "NESHAP" regulations apply to UVM, based on the types and quantities of asbestos present, the setting in which the ACM is identified, and whether asbestos is simply present, or is addressed through abatement procedures.

Over the past thirty years UVM has abated a significant amount of ACM throughout its campuses as a part of renovation, operations & maintenance and demolition. Generally, the types of asbestos that may still remain in buildings on-campus are primarily thermal system insulation (TSI), vinyl-asbestos tiles (VAT) and associated adhesives, flooring and baseboard mastics, caulking/sealants, surfacing materials/coatings and ceiling tiles. All materials must be inspected by a Vermont licensed Asbestos Inspector prior to disturbance or renovation. The TCO maintains both Consultant and Contractor Entity licenses, and employs licensed individuals, in order to most efficiently and cost effectively manage asbestos.

This Asbestos Management Program (AMP) describes how UVM complies with state and federal requirements for asbestos management and, where appropriate, describes the Best Management Practices (BMPs) to ensure compliance with the regulations.

- Section 2.0 of this Plan provides Definitions and a Regulatory Overview of the state and federal regulations and policies pertaining to management of ACM and PACM and prioritizes response actions to be taken for these ACM.
- Section 3.0 designates areas of responsibility, UVM personnel and protocol for coordinating asbestos identification, management and abatement.
- Section 4.0 describes how UVM identifies ACM and classifies its form, condition and potential for disturbance.
- Section 5.0 addresses the inventory and labeling requirements.
- Section 6.0 describes asbestos training components and levels.
- Section 7.0 provides an overview of the required medical surveillance for staff and subcontractors required to perform work that involves friable and non-friable asbestos.
- Section 8.0 provides Operations and Maintenance Procedures.
- Section 9.0 provides Emergency Response Procedures utilized by UVM.
- Section 10.0 provides information regarding how UVM maintains and stores records of activities related to the AMP

## 2. DEFINITIONS AND REGULATORY OVERVIEW

Key definitions and acronyms as well as a summary of asbestos regulations are provided below. There are definitions that are not in this document but are in standards and regulations referenced in this document. Any definition noted with a “n” comes from ASTM standards.

### 2.1 DEFINITIONS

Number	Name	Definitions
2.1.01	<b>Abatement</b>	The removal, repair or encapsulation of ACM or debris/dust contaminated with asbestos.
2.1.02	<b>Accessible location, n</b>	A functional space or part thereof that can be inspected without requiring destructive testing or presenting an unacceptable health or safety risk to the inspector, and where entry is not prohibited by security or other institutional restrictions.
2.1.03	<b>ACM - asbestos-containing materials, n</b>	Material containing more than one percent asbestos.
2.1.03.1	<b>ACM - miscellaneous materials, n</b>	Material, other than surfacing material and thermal system insulation, on interior and exterior structural, mechanical, electrical, or architectural components and surfaces. Miscellaneous material includes but is not limited to ceiling tiles, gaskets, floor coverings and mastics, wallboard joint compound, roofing materials, and cementitious products.
2.1.03.2	<b>ACM - Surfacing material, n</b>	Material that is sprayed, troweled-on, or otherwise applied to interior and exterior structural and architectural surfaces. Surfacing material includes acoustical plaster on ceilings, fireproofing on structural members, textured paint and exterior stucco, and other materials applied to surfaces for acoustical, decorative, fireproofing and other purposes.
2.1.03.3	<b>ACM - Thermal system insulation, n</b>	Material which is applied to interior and exterior mechanical components to reduce heat gain or loss. Thermal system insulation includes insulation on pipes, fittings, boilers, breeching, tanks, ducts, and other mechanical components.
2.1.04	<b>Asbestos</b>	A term that describes six naturally occurring fibrous minerals: the asbestiform varieties of serpentinite (chrysotile), riebeckite (crocidolite), cummingtonite-grunerite (amosite), anthophyllite, and actinolite-tremolite. Chrysotile, amosite, and crocidolite are the most commonly used types of asbestos in building products.
2.1.05	<b>Building asbestos survey, n</b>	An activity to determine the presence, location, condition, and quantity of asbestos-containing materials in a building or facility, or on the property containing the building or facility.

2.1.06	<b>Bulk sample, n</b>	A sample of suspect asbestos-containing material collected for identification of asbestos and determination of the percent of the components in the sample.
2.1.07	<b>Class I, II, III Asbestos Work</b>	Work activities that will be performed by a trained outside contractor that involve the removal or repair of asbestos-containing thermal system insulation, surfacing materials (e.g. spray-on fireproofing) or other miscellaneous ACM.
2.1.08	<b>Class IV Asbestos Work</b>	Work that involves the maintenance and custodial activities during which employees or subcontractors may contact but do not disturb ACM or PACM. It may involve cleaning in mechanical rooms or removal of equipment or debris in areas where ACM is or may be present.
2.1.09	<b>Competent person</b>	One who is capable of identifying existing asbestos hazards in the workplace and selecting the appropriate control strategy for asbestos exposure, and who has the authority to take prompt corrective measures to eliminate the identified hazards. For Class I, II, or III work, the competent person must also meet the special training requirements. All abatement and other construction work conducted in regulated areas must be supervised by a competent person.
2.1.10	<b>Crawl space, n</b>	An accessible area that may have a dirt floor, usually with low head room.
2.1.11	<b>Destructive testing, n</b>	Inspection procedures that necessarily involve objectionable or noticeable damage to building surfaces, or require penetration of a surface such as a wall, ceiling, chase or shaft to gain access to a concealed space.
2.1.12	<b>Dust and debris, n</b>	Visible particles, fragments, or chunks of material, large enough to have settled in the work area by virtue of their weight, that are presumed to have originated from the material abated by the response action, or from a fiber release episode.
2.1.13	<b>Fiber release episode, n</b>	Uncontrolled or unintentional disturbance of asbestos-containing materials which results in the generation of dust and debris.
2.1.14	<b>Friable ACM</b>	Material easily crumbled or powdered by moderate (hand) pressure, and includes previously non-friable material after such previously non-friable material becomes damaged to the extent that when dry it may be crumbled, pulverized, or reduced to powder by hand pressure.
2.1.15	<b>Functional space, n</b>	An area within a building or facility that is used for a specific purpose. Examples include a warehouse in a manufacturing plant and a conference room in an office building. A functional space can be vertical in extent, such as a pipe chase, and span several floors.

2.1.16	<b>Homogeneous area, n</b>	Surfacing material, thermal system insulation material, or miscellaneous material that is uniform in color and texture, and apparent or known date of installation.
2.1.17	<b>Laboratory, n</b>	An entity that is equipped and qualified to perform one or more of the Microscopy, (3) identify and quantify airborne fibers with following analyses, using approved methods: (1) identify and quantify asbestos in bulk samples by Polarized Light Microscopy; (2) identify and quantify asbestos in bulk samples by Transmission Electron Microscopy, (3) identify and quantify airborne fibers with Phase Contrast Microscopy.
2.1.18	<b>Non-friable ACM</b>	Material that, when dry, may not be crumbled, pulverized or reduced to powder by hand pressure.
2.1.19	<b>Non-friable organically bound (NOB) materials, n</b>	Materials that are not friable and that consist of fibers and other particulate matter embedded in a solid matrix of asphaltic, vinyl or other organic substances.
2.1.20	<b>Operations and Maintenance (O&amp;M) program, n</b>	A proactive management program to provide periodic surveillance of asbestos-containing materials, maintain them in good condition, mitigate fiber release from existing asbestos containing materials, and clean up asbestos-containing dust and debris that has been released, in order to minimize worker or occupant exposure to asbestos fibers.
2.1.21	<b>Permissible Exposure Limits (PELs)</b>	The limits established by OSHA to protect workers against the health effects of exposure to hazardous substances in the air. For asbestos, the PEL is 0.1 fiber/cc of air, based on an 8-hour time weighted average (TWA). Excursion limit: 1.0 fiber/cc averaged over 30 minutes.
2.1.22	<b>Polarized light microscopy (PLM), n</b>	A method of analytical mineralogy that uses an optical microscope to determine the optical properties of sample constituents and, in the case of bulk sample analysis for asbestos, to provide positive identification of suspect fibers as asbestos and to quantify the percent of asbestos in the sample.
2.1.23	<b>Presumed Asbestos Containing Material (PACM)</b>	Thermal system insulation (TSI) and surfacing material found in buildings constructed no later than 1980 must be presumed to contain asbestos. The designation of a material as "PACM" may be rebutted pursuant to 29 CFR 1910.1001(j)(8). For remediation work, TSI and sprayed or troweled on surfacing materials must be treated as asbestos-containing, unless a determination is made in compliance with 29 CFR 1926.1101(k)(5) that the material is not asbestos-containing. Asphalt and vinyl flooring material installed prior to 1980 must also be considered as asbestos containing during remediation work unless the employer, pursuant to 29 CFR 1926.1101 (g)(8)(i)(I), determines that it is not asbestos-containing.
2.1.24	<b>Regulated "Asbestos Containing Material" (ACM)</b>	Material composed of asbestos of any type and in an amount greater than one percent by weight, either alone or mixed with other fibrous or non-fibrous material.
2.1.25	<b>Regulated area</b>	Established by the employer to demarcate areas where Class I, II or III asbestos work is conducted or otherwise where airborne concentrations of asbestos exceed, or there is a reasonable

- possibility that they may exceed, the PELs. Only personnel authorized by Tufts and required by work duties can be present in a “regulated area.”
- 2.1.26 Response action, n** A method of abatement (such as removal, encapsulation, or enclosure) or operations and maintenance (such as repair, clean-up, or preventive measures) of asbestos-containing material in any form, for any purpose whatsoever.
- 2.1.27 Suspect material, n** Material that is sampled or is presumed to contain asbestos on the basis of its location, purpose, appearance and other factors considered by the inspector.

## 2.2 ACRONYMS

<b>ACM</b>	Asbestos-containing materials
<b>AMP</b>	Asbestos Management Plan
<b>ANR</b>	Agency of Natural Resources
<b>AHERA</b>	Asbestos Hazardous Emergency Response Act
<b>BMP</b>	Best Management Practice
<b>BON</b>	Building Occupant Notice
<b>DEC</b>	Department of Environmental Conservation
<b>USEPA</b>	United States Environmental Protection Agency
<b>HEPA</b>	High Efficiency Particulate Air
<b>HVAC</b>	Heating, Ventilation and Air Conditioning
<b>MTA</b>	Mastic Tile Adhesive
<b>NAD</b>	No Asbestos Detected
<b>NESHAP</b>	National Emission Standard for Hazardous Air Pollutants
<b>NOB</b>	Non-friable organically-bound
<b>OSHA</b>	Occupational Safety and Health Administration
<b>PACM</b>	Presumed asbestos-containing material
<b>PEL</b>	Permissible Exposure Limit
<b>PPD</b>	Physical Plant Department
<b>PPE</b>	Personal Protective Equipment
<b>PLM</b>	Polarized Light Microscopy
<b>RA</b>	Risk Assessment
<b>RACM</b>	Regulated Asbestos Containing Material
<b>TEM</b>	Transmission Electron Microscopy
<b>TCO</b>	Training & Compliance Office
<b>TSI</b>	Thermal system insulation
<b>UVM</b>	Universitas Viridis Montis, or University of the Green Mountains.
<b>VAT</b>	Vinyl Asbestos Tile
<b>VOSHA</b>	Vermont Occupational Safety and Health Administration

## 2.3 REGULATIONS AND STANDARDS

The following regulations and standards pertain to the management and/or abatement of ACM and PACM. These summaries are provided as a reference and do not necessarily imply that UVM is currently required to comply with all of these regulations and/or policies.

### 2.3.1 EPA - Clean Air Act (CAA) (42 USC § 7401 et seq.)

This law defines the EPA's responsibilities for protecting and improving the nation's air quality and the stratospheric ozone layer and includes provisions for the EPA to set national emission standards for hazardous air pollutants, including asbestos.

### 2.3.2 EPA 40 CFR Part 61 Subpart M – NESHAP for Asbestos

The NESHAP establishes notification requirements and procedures for emission control. The Asbestos NESHAP regulation applies to the owner or operator of a demolition or renovation activity. The NESHAP specifies work practices to be followed during renovations of buildings which contain a certain threshold amount of friable asbestos and during demolition of all structures and facilities (no threshold amount). The NESHAP also regulates asbestos waste handling and disposal. Specifically, all asbestos waste transport must be documented by a “waste shipment record” which is signed by the generator (TCO or designated representative), the abatement contractor, the transporter and the final disposal site operator.

For a facility being renovated or demolished, all NESHAP requirements apply if combined amount of Regulated Asbestos Containing Material (RACM) is:

- At least 80 linear meters (260 linear feet) on pipes or at least 15 square meters (160 square feet) on other facility components.
- At least 1 cubic meter (35 cubic feet) off facility components where the length or area could not be measured previously.

RACM is defined as: friable, Category I non-friable that has become friable, Category 1 non-friable subjected to sanding, etc., or Category II non-friable that has a high probability of becomes crumbled, pulverized, etc. Note that Category 1 is non-friable ACM including resilient floor covering and asphalt roofing products containing more than 1% asbestos as determined by PLM (Polarized Light Microscopy). Category II is non-friable excluding Category I containing more than 1% asbestos and cannot be crumbled, pulverized or reduced to powder by hand pressure.

For demolition of less than these amounts only notification requirements apply.

### **2.3.3 The Asbestos Hazard Emergency Response Act (AHERA) (Toxic Substances Control Act (TSCA) Title II) ([15 U.S.C. § 2641-2656](#))**

This law required EPA to promulgate regulations (e.g., the Asbestos-Containing Materials in Schools Rule) requiring local educational agencies to inspect their school buildings for asbestos-containing building material, prepare asbestos management plans and perform asbestos response actions to prevent or reduce asbestos hazards. AHERA also tasked EPA with developing a model plan for states for accrediting persons conducting asbestos inspection and corrective-action activities at schools. The Toxic Substances Control Act defines asbestos as the asbestiform varieties of: chrysotile (serpentine); crocidolite (riebeckite); amosite (cummingtonite/grunerite); anthophyllite; tremolite; and actinolite.

- [TSCA Subchapter II: Asbestos Hazard Emergency Response](#)

### **2.3.4 EPA - Asbestos School Hazard Abatement Reauthorization Act (ASHARA)**

This law extended funding for the asbestos abatement loan and grant program for schools. ASHARA also directed EPA to increase the number of training hours required for the training disciplines under the Asbestos Model Accreditation Plan (MAP) and to expand the accreditation requirements to cover asbestos abatement projects in all public and commercial buildings in addition to schools.

### **2.3.5 VOSHA – 29 CFR 1910.1001 General Industry Standard**

29CFR1910.1001 Asbestos (General Industry regulation), applies to all occupational exposures to asbestos in all industries where ACM is not disturbed. For example, at the University of Vermont (UVM) campus, this regulation applies to housekeeping and maintenance personnel who work in areas that contain asbestos but they do not directly work with asbestos. This standard covers any and all quantities of asbestos within the workplace.

### **2.3.6 VOSHA - 29CFR1926.1101 Construction Industry Standard**

29CFR1926.1101 Asbestos (Construction Industry regulation), applies to asbestos in construction work, which includes demolition or salvage of structures where asbestos is present; removal or encapsulation of ACM; construction, alteration, repair, maintenance or renovation of structures, substrates, or portions thereof, that contain asbestos; asbestos spill/emergency cleanup; and transportation, disposal, storage, containment of and housekeeping activities involving asbestos or products containing asbestos, on the site or location at which construction activities are performed. Work conducted by asbestos abatement contractors must meet the minimum requirements of this standard.

### **2.3.7 VDH – Vermont Regulations for Asbestos Control (VRAC), V.S.A. Title 18, Chapter 26 Effective February 1987, Amended 1995**

These regulations as authorized require that all persons who perform asbestos abatement of ACM in any facility must obtain certification prior to commencing such asbestos abatement. These regulations have identified various entity and individual licenses based on the roles and responsibilities for asbestos abatement activities. These activities include: inspections, monitoring, identification through laboratory analysis, design, demolition/renovation, installation, reinstallation, handling, transporting, storage, or disposal of a facility or facility component that contains asbestos, ACM, or asbestos containing waste. These regulations also established notification requirements, procedures for emission control, air cleaning and waste disposal. The owner/operator, asbestos abatement contractor, or other entity performing asbestos abatement must notify the intent to perform asbestos abatement with an approval process. This requirement is coordinated with the notification requirements established by the VDH requiring a notification 10 working days prior to commencement of planned work involving the removal of any amount of asbestos over 10 linear or square feet.

### **2.3.8 ASTM E1368-14 Standard Practice for Visual Inspection of Asbestos Abatement Projects**

This practice covers procedures for performing visual inspections of asbestos response actions to: establish the extent of the required work before it begins; determine the progress and quality of the work and evaluate the completeness of the response action; and evaluate the cleanliness (if performed) and subsequent to the dismantling of critical barriers.

### **2.3.9 ASTM E2356-14 Standard Practice for Comprehensive Building Asbestos Surveys**

This practice describes the procedures for conducting comprehensive surveys of buildings and facilities for the purpose of locating, identifying, quantifying, and assessing ACMs

### 3. RESPONSIBILITIES

The following UVM personnel are responsible for the administration of the AMP and the coordination of asbestos-related activities.

#### 3.1 PHYSICAL PLANT DEPARTMENT (PPD) TRAINING & COMPLIANCE OFFICE (TCO)

The TCO maintains Consultant and Contractor Entity licenses, and licensed individuals, in order to most efficiently and cost effectively manage asbestos in buildings and facilities.

##### 3.1.1 TCO MANAGER

The TCO Manager (**Vince Brennan**) reports to the Assistant Director of the Physical Plant Department (**Luce Hillman**) and is responsible for the operation and management of the University's Asbestos Management Program, including developing the written Asbestos Management Program, providing employee training and designing Job Hazard Analysis (JHA) for specific operations. The Manager designs, implements and maintains a safety & training programs for the PPD that meets or exceeds OSHA and EPA standards along with other applicable regulations, while enhancing the growth and professional development of PPD employees. He designs or coordinates design of databases that are pertinent in tracking information that is relevant to safety, training and asbestos management, and manages other types of remediation projects.

##### 3.1.2 TCO SUPERVISOR

The TCO Supervisor (**Chris Walker**) Supervise and coordinate activities of in-house hazardous materials technicians/workers and hired contractors. Delegate work assignments, monitor/review quality of work, schedule staff, and provide technical assistance and/or training. Work requires the ability to analyze and troubleshoot problems. Design and management of projects involving asbestos in accordance with State and Federal regulations, as well as UVM procedures and practices. The TCO Supervisor performs inspections and investigations of suspect asbestos as required. Contribute to administration and coordination of safety programs. Oversee equipment evaluation, purchase, maintenance and care. Develop specialized reports and documents utilizing various computerized applications. Encourage a work place that promotes safety within the shop and field. This position reports to TCO Manager, and requires active engagement in learning and practicing principles of social justice and inclusion, environmental sustainability and delivering great customer experience.

##### 3.1.3 TCO ADMINISTRATOR COORDINATOR

The TCO Administrator Coordinator (**Stephen Znamierowski**) reports to the TCO Manager and is responsible for developing and providing employee training and designing Job Hazard Analysis (JHA) for specific operations within the written Asbestos Management Program. This position also performs inspections and investigations of suspect asbestos as required. Contribute to administration and coordination of safety programs. This position reports to TCO Manager, and requires active engagement in learning and practicing principles of social justice and inclusion, environmental sustainability and delivering great customer experience.

### **3.1.4 TCO SENIOR TECHNICIAN**

The Senior Technician (**Dan Lowe**) Assist Supervisor and act as lead person in the responsibility of coordinating the work of the in-house Technicians, Workers and outside contractors. Delegate work assignments, monitor/review quality of work, schedule staff, and provide technical assistance and/or training. Responsible for daily operations with the supervisor available to consult on problems and policy decisions. Work requires the ability to analyze and troubleshoot problems. All of these details are essential to proving regulatory compliance and positive public relations. Assist in the design and management of projects involving asbestos in accordance with State and Federal regulations and UVM procedures and practices. Perform inspections and investigations of suspect asbestos as required. Provide technical assistance within established guidelines in support of safety and training programs. Participate in equipment evaluation, purchase, maintenance and care. Promote a work place culture which encourages safety within the field and shop. Operate University vehicle. This position reports to the Chris Walker and requires active engagement in learning and practicing principles of social justice and inclusion, environmental sustainability and delivering great customer experience.

### **3.1.4 TCO TECHNICIAN**

The Technician (**Andrew Blount**) performs environmental hazard cleanup for asbestos in accordance with State and Federal regulations and UVM procedures and practices. Perform inspections of asbestos suspect materials prior to renovation and/or demolition. Monitor asbestos projects performed by in-house personnel and hired contractors. Promote a work place culture which encourages safety within the field and shop. Reports to the Chris Walker. Actively engage in learning and practicing principles of social justice and inclusion, environmental sustainability and delivering great customer experience.

### **3.1.5 TCO ADMINISTRATIVE SUPPORT**

The Administrative Support (**Karen Lemire**) processes and coordinates service requests for asbestos operations and maintenance to support to the Training & Compliance Office. Oversee records maintenance, reports and work orders. Duties include: review of daily time logs, create forms, enter service and material requisitions, process credit card payment transactions related to supplies and contracted services. Purchase inventory and supplies and reconcile stock room. Process and coordinate service requests for asbestos operations and maintenance. Access information utilizing appropriate computer software programs. Promote a work place that encourages safety within the office and field. Access information utilizing appropriate desktop applications. This position reports to Vince Brennan and requires active engagement in learning and practicing principles of social justice and inclusion, environmental sustainability and delivering great customer service.

## **3.2 UVM PROJECT MANAGERS**

Notify the TCO through the FAMIS Work Order System in advance of renovation, remodel, and demolition projects of all University properties and holdings, to ensure compliance with applicable regulations regarding asbestos.

## **3.3 RISK MANAGEMENT & SAFETY DEPARTMENT**

Provides review of AMP, and delegates' authority of asbestos related activities to the TCO

## **3.4 COMPLIANCE & PRIVACY SERVICES**

Provides review of AMP, and delegates' authority of asbestos related activities to the TCO.

### **3.5 OTHER UVM PERSONNEL**

Other UVM Departments with personnel that work around, but not with asbestos-containing materials, must request and participate in annual asbestos awareness training conducted by the TCO.

## **4. IDENTIFICATION OF ASBESTOS**

### **4.1 OVERVIEW**

ACMs have been used in buildings for over a century. UVM is a campus comprised of buildings that have been constructed or renovated for over 200 years; therefore, it is likely that asbestos-containing materials may have been or are present in campus buildings. TCO has conducted various types of Surveys in many campus buildings, and Project Design Surveys for all renovation, remodeling, and demolition projects. TCO maintains records of all surveys including samples that have been collected over thirty years to be used as reference for asbestos management in the future. Although the TCO has identified and removed significant amounts of asbestos, identification of asbestos hazards and response actions to abate them are on-going due to the quantity of ACM still remaining.

TCO conducts surveys for ACM in campus buildings within the spirit of ASTM E2356 Standard Practice for Comprehensive Building Asbestos Surveys, an industry consensus document developed by ASTM International. The ASTM E2356 standard allows UVM to comply with applicable asbestos regulations through a holistic approach. TCO uses this standard practice for locating, identifying, quantifying and assessing asbestos-containing materials. The results of a Baseline Survey are used for ongoing management of asbestos-containing materials, including Operations Maintenance, removal and other response actions. This includes response actions associated with renovations. A Comprehensive Building Asbestos Survey is also intended to provide information required for removal of asbestos-containing materials prior to demolition of a building or facility. TCO uses three types of surveys discussed in this document: Baseline Surveys, Pre-Construction Surveys and Project Design Surveys. This standard practice discusses the following activities for each of the above types of surveys:

- Planning the survey to meet defined objectives;
- Obtaining and reviewing information on the building or facility including previous surveys and response actions;
- Conducting the physical activities of inspecting the premises and collecting bulk samples of suspect materials;
- Analyzing the bulk samples for asbestos type and content;
- Assessing the Current Condition and Potential for Disturbance of asbestos-containing materials;
- Preparing a report that includes a narrative discussion of the findings, tabulations of inspection, sampling and analysis results, graphical depiction of the areas inspected, and the results of the assessment.

This standard practice does not include air sampling or surface (dust) sampling for purposes of evaluating a potential exposure hazard from airborne asbestos fibers. It does not predict airborne fiber concentrations or the risk of developing an asbestos-related disease.

The following subsections describe how TCO developed and maintains an inventory of ACM and PACM in campus buildings, how these materials are classified and assessed, and how information is provided to minimize the hazards associated with them.

## 4.2 INVENTORY OF ACM & PACM

An inventory of areas on campus known or presumed to contain ACM is maintained by TCO by trained/licensed personnel. Information is collated and distributed as required. As buildings or portions of buildings that contain ACM are renovated or demolished, and the impacted ACM is removed, the inventory is updated. The following details are provided in the inventory:

- Location, type, quantity, and condition-of ACM or PACM;
- Date of inspection and/or sample collection and asbestos content (if applicable); and,
- Description of response actions or preventive measures taken (if applicable).

In order to classify ACM, an inspection is performed whereby all homogeneous areas of material that are suspected to contain asbestos are located and listed. These materials are sampled and analyzed, and the areas are treated as ACM unless the samples confirm them to be non-asbestos. Materials that are not sampled are classified as PACM and treated as ACM. The location of the materials suspected of containing asbestos is documented and then categorized as follows.

## 4.3 EXAMPLES OF ACM & PACM

Examples of ACM or PACM on the UVM campus that have been identified are listed below, classified as surfacing material, thermal system insulation and miscellaneous material as defined in section 2.1. This list is ongoing, asbestos was used in over 3000 products.

- 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

There is NOT an outright ban on use of asbestos in most products, and although use of asbestos has been significantly reduced in most products, there are many products and materials still made intentionally and unintentionally with asbestos. For this reason, TCO subjects new supplies of suspect building materials to sampling and analysis to ensure that no asbestos-containing materials are installed in campus buildings.

#### 4.4 ASSESSMENT INFORMATION

The possibility of fiber release from ACM is based on the material's condition, physical characteristics (e.g., friability), and location (see below). These factors can be used to evaluate the need for response actions according to the ASTM E2356-14 methodology. These assessments can be used to prioritize response actions for ACM that may remain at the campus.

##### **Current Condition of ACM**

- Evidence of deterioration or delamination from the underlying surface (e.g., hanging material)
- Evidence of physical damage (e.g., dust/debris present)
- Evidence of water damage

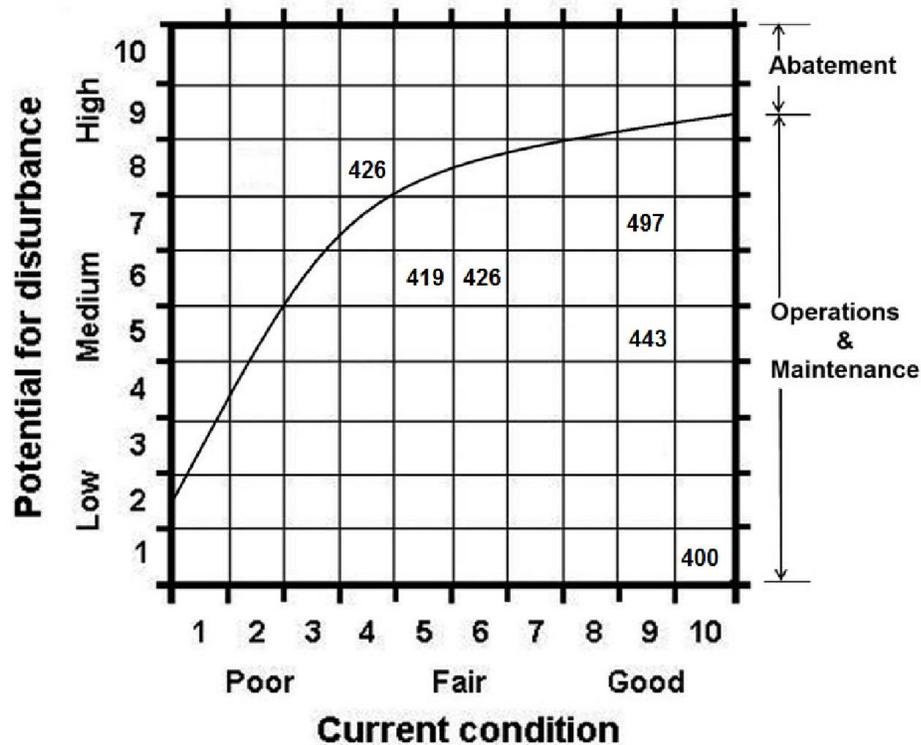
##### **Potential for Future Damage or Disturbance of ACM**

- Proximity to air plenum or direct airstream (e.g. above a dropped ceiling with open plenum)
- Accessibility, visibility (to occupants and maintenance staff) and degree of activity (vibration, movement of occupants)
- Change in area or building use

The following table and chart provide an example of ACM Current Condition and Potential for Disturbance ratings, and the decision on whether the BMP would be abatement or Operations & Maintenance (O&M). The chart shows that the Exposed textured plaster in Classroom 426 is a candidate for abatement while the remaining ACM can be managed with an O&M program.

Table 2. Example of ASTM E2356 Assessments

Functional Space	Asbestos-Containing Materials	Assessment		
		Current Condition	Potential for Disturbance	Reason
Classroom 426	Exposed textured plaster	4	8	Water damage
Classroom 419	Textured plaster above drop ceiling	5	6	Recessed fixtures
Classroom 426	Exposed 12" x 12" vinyl asbestos tile	6	6	Scuffed tile
Corridor 497	Exposed textured Plaster	9	7	Flush-mounted light fixtures
Offices 443	12" x 12" exposed green/black tile	9	5	Moderate traffic
Classroom 400	12" x 12" vinyl asbestos tile under carpet	10	1	Low traffic



Source: ASTM E2356 Standard Practice for Comprehensive Building Asbestos Surveys.  
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Response actions are prioritized according to assessments such as those in Table 2 and Figure 1, and are carried out according to **7. ASBESTOS ABATEMENT PROCEDURES** and **7.2 OPERATIONS & MAINTAINANCE (O&M) ACTIVITIES**.

## 5. HAZARD COMMUNICATION

The potential hazards from asbestos-containing materials and precautions to avoid disturbing them are described in a hazard communication program that involves signs, labels and awareness training.

### 5.1 ASBESTOS SIGNS

TCO will provide signs and labels to communicate hazard information to employees that may enter areas containing ACM and/or PACM. This includes regulated areas where exposure to airborne asbestos fibers exceed or may reasonably exceed the OSHA Permissible Exposure Limit and typically apply to areas where abatement or Operations and Maintenance work is in progress. Signs are also posted at the entrance to mechanical rooms or other areas containing ACM and/or PACM where employees reasonably can be expected to enter in the normal course of their work that does not require them to disturb ACM.

The wording on signs is specified in the OSHA Construction Industry Standard:

**DANGER  
ASBESTOS  
MAY CAUSE CANCER  
CAUSES DAMAGE TO LUNGS  
AUTHORIZED PERSONNEL ONLY**

For regulated areas the following must be added to the sign:

**WEAR RESPIRATORY PROTECTION  
AND PROTECTIVE CLOTHING  
IN THIS AREA**

In addition to the wording specified by OSHA, TCO may add the following information to the signs:

- Material present;
- ACM or PACM location; and
- Appropriate work practices which, if followed, will ensure that ACM and/or PACM will not be disturbed.
- TCO phone number

To ensure employees comprehend the hazard information, TCO will use, as warranted, foreign languages, pictographs, graphics, and awareness training, or a combination of these methods. Additionally, the TCO will notify affected campus community of asbestos abatement activities through a Building Occupant Notification (BON) system which will be electronically distributed, posted on the TCO website and physically posted at entrances to the affected building(s).

## 5.2 ASBESTOS LABELS

Labels are affixed to all products containing asbestos and to all containers containing such products, including bags or containers of protective clothing and equipment, scrap, waste, and debris containing asbestos fibers. Where feasible, installed asbestos products are marked with a visible label that bears the following information:

**DANGER  
CONTAINS ASBESTOS FIBERS  
MAY CAUSE CANCER  
CAUSES DAMAGE TO LUNGS  
DO NOT BREATHE DUST  
AVOID CREATING DUST**

## 6. TRAINING AND QUALIFICATIONS

Asbestos activities are ONLY carried out by trained/licensed TCO staff, under the Entity Licenses. The following is a description of the training program that is implemented by contractors or the University for personnel performing activities that have the potential to result in disturbance of ACM or PACM. Contractors conducting asbestos abatement activities at the University must, provide staff trained in accordance with the requirements of the Model Accreditation Plan of the Asbestos Hazard Emergency Response Act (AHERA), as required by the Asbestos School Hazard Abatement Reauthorization Act (ASHARA), National Emission Standards for Hazardous Air Pollutants (NESHAPS), Occupational Safety and Health Administration (OSHA) asbestos rules, Vermont Regulations for Asbestos Control (VRAC). As appropriate, University staff will be trained in general accordance with these regulations.

Other University personnel who may work in areas where ACM or PACM is present, and may contact but not disturb these materials, receive awareness training as described in 4.3.3.

### 6.1 ASBESTOS SITE INSPECTOR TRAINING

All Asbestos Inspectors must receive 32-hour training provided by a VDH-licensed Asbestos Training Provider and must also submit an application for certification to VDH in order to obtain a license. VDH also requires an annual 4-hour refresher course.

### 6.2 ASBESTOS PROJECT MONITOR (PM) TRAINING

All Asbestos PM's must receive 40-hour training provided by a VDH-licensed Asbestos Training Provider and must also submit an application for certification to VDH in order to obtain a license. VDH also requires an annual 8-hour refresher course.

### **6.3 ASBESTOS MANAGEMENT PLANNER (MP) TRAINING**

All Asbestos MP's must receive 16-hour training in addition to the Site Inspector requirements provided by a VDH-licensed Asbestos Training Provider and must also submit an application for certification to VDH in order to obtain a license. VDH also requires an annual 4-hour refresher course.

### **6.4 ASBESTOS PROJECT DESIGNER TRAINING**

All Asbestos Designers must receive 24-hour training provided by a VDH-licensed Asbestos Training Provider and must also submit an application for certification to VDH in order to obtain a license. VDH also requires an annual 8-hour refresher course.

### **6.5 ASBESTOS WORKER TRAINING**

All Asbestos Workers must receive 32-hour training provided by a VDH-licensed Asbestos Training Provider and must also submit an application for certification to VDH in order to obtain a license. VDH also requires an annual 8-hour refresher course.

### **6.6 ASBESTOS SUPERVISOR TRAINING**

All Asbestos Supervisors must receive 40-hour training provided by a VDH-licensed Asbestos Training Provider and must also submit an application for certification to VDH in order to obtain a license. VDH also requires an annual 8-hour refresher course.

### **6.7 ASBESTOS AWARENESS TRAINING – OSHA CLASS IV WORKERS**

All maintenance or custodial staff who perform housekeeping work, or other employees performing work in areas where ACM or PACM is present, will receive general asbestos awareness training annually (typically 2 hours) as required by OSHA 29 CFR 1910.1001 and 29 CFR 1926.1101, and by VOSHA 29 CFR 1910.1001 and 1926.1101 such training will cover:

- health effects of asbestos;
- locations of ACM and PACM in the building/facility, including:
  - the locations of thermal system insulation and surfacing ACM/PACM; and,
  - asbestos-containing flooring material, or flooring material where the absence of asbestos has not yet been certified;
- instruction in recognition of damage, deterioration, and delamination of asbestos containing building materials;
- BMPs in housekeeping;
- proper response to fiber release episodes; and
- overview of the campus asbestos management program.

## **6.8 CONTRACTED MAINTENANCE/CUSTODIAL STAFFING**

In the case of ‘contracted out’ maintenance and custodial staff, the contractor shall provide such training for its employees outlined in 29CFR192.1101 for Class IV.

## **7. MEDICAL SURVEILLANCE**

All TCO asbestos trained and licensed staff are included in the medical surveillance program, and are evaluated on an annual basis. The evaluation includes, but is not limited to: pulmonary function test (PFT), chest x-ray (as applicable), general physical examination, and medical questionnaire for respiratory protection and asbestos. The Risk Management & Safety Department provides the contracted services for medical examinations.

## **8. RESPONSE ACTION PROCEDURES**

Response actions, including asbestos abatement procedures (removal, encapsulation, and enclosure) and Operations and Maintenance (O&M) including repair and clean-up, are designed to prevent the release of asbestos fibers through management practices adjusted to fit the type (s) of ACM in the building.

### **8.1 RENOVATION AND DEMOLITION ACTIVITIES**

Guidelines for renovation on construction projects are approved by the TCO Manager. Prior to the start of abatement or construction work involving ACM or PACM, TCO will notify the following parties of the presence, location and quantity of ACM or PACM in the work area:

- Prospective contractors applying or bidding for work whose employees reasonably can be expected to work in or adjacent to areas containing such material,
- UVM employees who will work in or adjacent to areas containing such material,
- Employers of other service contractors performing work within or adjacent to areas containing such materials, and
- Any tenants who will occupy areas containing such material.

The notification will be provided by the TCO in writing through the BON system. Additional oral communication may occur. Abatement and construction contractors are responsible for informing their own employees of the location and quantity of ACM and/or PACM present in the area and the precautions to be taken to insure that airborne asbestos is confined to the area. Most projects require a 10 day notification to VDH prior to commencement of the work. If contractors discover ACM and/or PACM during work for UVM, they are required to inform TCO immediately of the discovery of the presence, location and quantity of such newly discovered ACM and/or PACM.

### **8.2 OPERATIONS & MAINTAINANCE (O&M) ACTIVITIES**

The TCO conducts a risk assessment (RA) of each activity associated with ACM in order to determine the level(s) of hazard(s) present. Based on the RA, a Job Hazard Analysis (JHA)

and/or Standard Operating Procedure (SOP) will be implemented in order to execute the work in accordance with applicable asbestos regulations. These records are stored and disseminated in the TCO electronic database.

## **9. EMERGENCY RESPONSE PROCEDURES**

The following emergency response procedures are to be followed in the event of potential exposure to an asbestos hazard.

### **9.1 INCIDENT REPORTING**

Any incident, accident, or emergency where asbestos fibers may have been released must be immediately reported to the TCO.

- TCO at 656-SAFE (7233). TCO will conduct an assessment of the potential exposure, and execute containment and cleanup procedures.

### **9.2 ASBESTOS RELEASE ACTION PLAN**

An asbestos release may include debris found on a horizontal surface, water or physical damage to ACM or other evidence of fiber release from friable or non-friable materials. Upon notification of a friable asbestos release, the TCO will restrict access to the area and the following Operations and Maintenance procedures will be followed:

If less than ten square or linear feet of ACM is released:

- Courtesy Notification to the VDH
- The debris is saturated using wet methods;
- The area is cleaned;
- The asbestos debris is placed in a sealed, leak-tight container; and,
- The area of damaged ACM is repaired.
- Any other applicable engineering controls deemed necessary by the TCO Supervisor/Manager.

These response actions will be carried out by an asbestos abatement contractor entity or trained/licensed TCO staff.

In addition to the above, if TCO determines that greater than ten square or linear feet of friable ACM has been dislodged:

- Notification to the VDH will be provided;
- Signs posted to restrict entry into the area;
- The HVAC system is shut off or temporarily modified to prevent the distribution of fibers into other areas in the building; and
- Any other applicable engineering controls deemed necessary by the TCO Supervisor/Manager.

## **10. RECORD KEEPING**

Copies of records pertaining to asbestos management activities at the University shall be maintained at the TCO to document compliance with the requirements of the AMP. These records should be made available to custodial and maintenance, regulatory or emergency personnel upon request and should be kept for a prescribed period of time. The originals of records shall be maintained at the TCO.

### **10.1 PERSONNEL TRAINING RECORDS**

TCO serves as the University contact for training and will maintain copies of training records in an electronic database system. The TCO will also maintain duplicate copies of training records. The completion of all training by maintenance and custodial workers and other related UVM personnel will be documented and will include:

- The person's name and job title;
- The date that training was completed;
- The location of the training; and,
- The number of hours completed in the training.

### **10.2 ASBESTOS INVENTORY**

TCO maintain records on the presence, location and quantity of ACM and PACM in University buildings and facilities. These records are kept for the duration of ownership and transferred to successive owners of applicable properties.

### **10.3 INFORMATION REGARDING ASBESTOS REMOVAL PROJECTS**

TCO manages/coordinates, approves, schedules and inspects all asbestos related activities conducted at the campus. TCO maintains survey or abatement related records. TCO maintains the copies of the abatement, clearance, and disposal activity records. TCO maintains all waste shipment records for 30 years following the removal of asbestos. The following information will be recorded for each response action or preventative Asbestos measure:

- A written description of the measure or action, including the method used;
- The location where the measure or action was taken;
- Reasons for selecting the measure or action;
- The start and completion dates of the work;
- The names and addresses of all workers and contractors involved with the work (if applicable);
- The VDH license number, and training provider name of all contractors involved with the work (a copy of the certificate);
- If ACM is removed, the name and location of the ACM storage or disposal site;
- Documentation of notification/permit to VDH, US EPA and City of Burlington;
- Personal and area air monitoring results (e.g., clearance air samples); and
- Final exposure monitoring results (if applicable).

### **10.4 CONTRACTS AND LICENSES OF PERSONS WORKING ON ASBESTOS-RELATED PROJECTS**

TCO maintains the contracts and licenses of personnel performing work on asbestos-related projects. The records will be available to regulatory or emergency personnel upon request.