



University of Vermont

Department of Environmental Health and Safety Occupational Health and Safety Office

321 Ryan Street
Essex, Vermont 05452

WATER INTRUSION RESPONSE PROGRAM

In accordance with
IICRC S500
IICRC S520
EPA Document 402-K-01-001
OSHA Publication SHIB 03-10-10

REVISED AND DISTRIBUTED BY:

THE UNIVERSITY OF VERMONT
DEPARTMENT OF ENVIRONMENTAL HEALTH AND SAFETY
OCCUPATIONAL HEALTH AND SAFETY OFFICE

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EMERGENCY AND ASSISTANCE

No work will be performed where an emergency cannot be immediately observed and/or prompt rescue assistance summoned.

FIRE – POLICE – RESCUE – EMERGENCY MEDICAL SERVICE..... 9-1-1

Dial 911 and tell them you are at the University of Vermont. Provide them with your building address, building name, and room number as well as the details of your emergency.

CALL IMMEDIATELY FOR ANY EMERGENCY
INCLUDING CHEMICAL SPILL, FIRE, INJURED,
TRAPPED, OR SICK PERSON.

UVM POLICE SERVICES..... (802) 656-3473
FIRE – POLICE – RESCUE – EMERGENCY MEDICAL SERVICE

[UVM Medical Center - Emergency Department](#) (802) 847-2434
111 Colchester Avenue, Main Campus, West Pavilion, Level 1, Burlington, VT 05401
(Medical emergency and evaluation)

[Champlain Medical Urgent Care](#)..... (802) 448-9370
150 Kennedy Drive, South Burlington, VT 05403
(Medical consultation and evaluation)

UVM and Other Administrative Offices

[Department of Environmental Health and Safety](#)..... (802) 656-7233
Occupational Health and Safety Office ohso@uvm.edu

[Service Operations Support](#)..... (802) 656-2560
(Physical Plant Department, chemical cleanup, disposal, and storage) sos@uvm.edu

[Department of Risk Management](#)..... (802) 656-3242
(Accident investigations, insurance services) risk.management@uvm.edu

Approved Vendors

SERVPRO of Winooski /Stowe..... (802) 655-7797
Serpro Industries, LLC.
195 Acorn Lane, Colchester, VT 05446

PuroClean Managed Services of Vermont.....(802) 864-5551
82 Leroy Road, PO Box 943, Williston, VT 05495

Environmental Hazards Management, Inc. (802) 862-4537
378 Boyer Circle, Williston VT 05495



PROGRAM STATEMENT

I. Purpose

The University of Vermont (UVM), Department of Environmental Health and Safety (EHS), Occupational Health and Safety Office (OHSO) is dedicated in providing safe work facilities for UVM Personnel (UVM employees (faculty/staff), students, and visitors, including contractors and consultants) and complying with federal and state occupational health and safety standards.

This document provides guidance in how to identify hazards and select the correct response actions in the event of a water intrusion (water loss or damage) inside a UVM building or facility.

All UVM Personnel, including administrators and union representatives, share a responsibility in responding in event of a water intrusion.

II. Standards

The information in this written program is intended to provide basic procedures in response to a water intrusion event and is a means to analyze workplace conditions, impacted materials, and determine appropriate corrective actions against occupational workplace hazards. Additionally, this program is written in accordance with:

IICRC S500

IICRC S520

EPA Publication [402-K-01-001](#) September 2008

OSHA Publication [SHIB 03-10-10](#) 11-08-13

III. Scope

Water intrusion events may impact building construction materials such as, but not limited to, flooring, framing network, wallboard, insulation, and ceiling components. Additionally, furnishings and other loose items can be affected, such as books and paper documents.

For prompt corrective action of any water intrusion immediately call Service Operations Support (SOS). SOS will contact the appropriate UVM personnel to respond. Work tasks shall be arranged through appropriate channels.

Although an expedient response is critical, taking short cuts can have undesirable consequences such as occupational exposures, mold growth, discolored surfaces, odor problems, and other hazards.

Based on availability of equipment and resources along with size and nature of the intrusion, OHSO in collaboration with Facilities Management's, Physical Plant and/or Custodial Services Department staff (In-House), whenever possible, will handle Category 1 events. In some cases, Category 2 water loss or damage can be handled In-House. Remediation can be handled In-House if water loss or damages do not exceed the following criteria:

- Low potential for health risks,
- twenty-four (24) square feet of wet materials,
- ten (10) square feet of materials with visible apparent mold growth, and/or
- approximately five (5) gallons of water.

If quantities exceed these amounts contact SOS. Approved vendors (service contractors) should be used for any large area intrusions, Category 2 and 3 releases, and as determined by the OHSO staff.



Important – Prior to building materials being disturbed, removed, and disposed of, the EHS – Environmental Safety and Compliance Office (ESC) shall be consulted to **confirm that building materials are negative for asbestos**. Please refer to UVM’s [Asbestos Management Program](#) for more information.

These guidelines for addressing water intrusion issues are general and do not cover all possible situations. OHSO should be consulted whenever there is a question that cannot be answered by these guidelines.

IV. Roles and Responsibilities

To successfully achieve UVM’s goal of Academic Excellence, individual members of our campus community must understand their roles and accept responsibility as described in UVM policies and plans. Please use the resource of UVM’s Safety websites to increase your personal awareness and minimize your risk for injury both on and off campus. These are summarized on the webpage [Health and Safety Roles and Responsibilities | Environmental Health and Safety | The University of Vermont \(uvm.edu\)](#).

We look to all members of the University community to do their part in helping to meet this goal.

A. Department Administration

1. Maintain and update Design Guidelines requiring that projects be designed according to current VOSHA standards and that hazard elimination, engineering controls, and administrative controls, for occupant use and maintenance work be designed into projects wherever feasible.
2. Provide administrative and financial support for this program within individual units.
3. Ensure that personal protective equipment (PPE) is provided and maintained within the department.
4. Support disciplinary action in the event that proper procedures are neglected and/or obviously not followed.

B. Department of Environmental Health and Safety

1. Designate and empower individuals who will act as competent and/or qualified person(s) who will be responsible for the preparation and implementation of this program.
2. Ensure that employees who will act as competent and/or qualified person(s) are adequately trained and/or qualified.
3. Ensure this program is implemented and maintained within the departments.
4. Consult with outside entities as needed.
5. Conduct response and communication activities.
6. Annual review and revision as necessary of this program to meet current state and federal regulations.

C. UVM Managers and Supervisors

1. Ensure and document that employees are informed and trained on water intrusion response.
2. Ensure proper use of assigned PPE to employees to protect from identified and potential hazards.
3. Coordinate the corrective actions required of hazards brought to their attention by employees.
4. Complete a “[First Report of Injury](#)” or “[Incident](#)” report and produce any additional documentation needed to investigate and work-related injuries and illnesses.



D. UVM Personnel

1. Comply with this program and any further safety recommendations provided by the supervisor and/or Occupational Health and Safety Office.
2. Complete required training and request further instructions if unclear.
3. Conduct assigned tasks in a safe manner and wear all assigned PPE.
4. Report to a supervisor any new hazards, unsafe or unhealthy work conditions, and job-related injuries and illnesses to the supervisor immediately.

INFORMATION AND TRAINING

Information and training will be provided or arranged by the Occupational Health and Safety Office to any unit or individual requesting guidance or training to satisfy implementation of this program.

Prior to conducting work in response to a water intrusion event, employees must be trained to know:

- appropriate channels and contacts in event of a water intrusion,
- categories and classifications of water,
- the potential hazards associated with work tasks,
- when PPE is necessary,
- equipment and cleanup methods,
- when an approved vendor should be called in for remediation activities.

Upon completion of the training, the employee must be able to demonstrate the above-mentioned information. Any type of training format can be used, as long as a hands-on portion is provided where necessary, such as PPE or equipment.

Retraining will be required when it is believed an employee does not have the understanding and/or skill in response and communication in event of a water intrusion. Also, retraining may be required if the following occurs:

1. Changes in the workplace show previous training does not meet requirements,
2. Other indications that employee(s) inadequacies in knowledge or information have not been retained.

For assistance, contact the Occupational Health and Safety Office.

CATEGORIES OF WATERS DEFINED

The category of water refers to the range of contamination in water considering both its originating source and quality after it contacts the materials on the intrusion site.

Category 1 – “Clean” water poses the lowest health risk to human building occupants and clean-up crews.

Examples: clean or potable water from a sink overflow, broken water or steam line, or rainwater infiltration.

Building materials and furnishings damaged have the best potential for being salvaged. There is a **24 to 48 hour** window of time to respond with corrective actions to damages. After this period of time, the amount of microbial growth and other hazards begins to lower the water quality leading to become Category 2.

Category 2 – “Grey” water in this category is in a large range of considerable levels of contamination; between clean and highly contaminated. This water has a significant degree of contamination due to its source, from bacterial and microbial growth or from contamination after the initial release.



Examples: storm drain backups, treated cooling water, some surface water, fire suppression systems, and discharges from equipment.

Because of the additional contaminant in the water, materials damaged are much more difficult to salvage.

Category 3 – “Black” water is highly contaminated water and likely to contain infectious viruses, bacteria, parasites, and other pathogenic agents. It has the likelihood of causing disease or infection from direct or even indirect contact. This water may also contain toxic and allergenic materials.

Examples: sewers and drainage backups, and some types of surface water.

Due to the contamination in the water, materials damaged are much more difficult to salvage.

CLASSES OF WATER LOSS DEFINED

The class of water refers to the range of the approximate wet surface area and permeability of affected materials remaining within the drying environment at the time drying is initiated.

Class 1 water losses affect only a certain portion of a room having the least amount of water absorption and will likely evaporate; materials are predominantly low porosity (e.g., water is retained on the surface, little or no wet carpet or cushion).

Class 2 water losses are identified if the entire room has been affected, significant amount of water absorption and evaporation load; water intrusion has flowed into the area and wet materials are medium to high porosity (e.g., carpet, gypsum wall board).

Class 3 water losses may affect a larger area, commonly coming from an overhead source. There is the greatest amount of water absorption and evaporation load; water intrusion where wet, porous materials represent majority of the combined floor, wall, and ceiling surface area in the space (e.g., carpet, gypsum wall, ceiling board).

Class 4 water losses are significant, causing major water damage. Water is deeply held or bound resulting in a low potential rate of evaporation after bulk water removal; affected materials are typically low in porosity or the building assemblies may require special methods, longer drying times, or substantial water vapor pressure differentials (e.g., plaster, hardwood, concrete, masonry, gym floors, structural cavities, stone, brick).

LEVELS OF MOLD

The level of mold refers to the range or total area of mold contamination on building materials and furnishings. Both items to consider is the originating source and quality after it contacts the materials on the intrusion site.

Level 1: Small Isolated Areas(10 square feet or less)

Remediation can be conducted In-House. Proper PPE shall be worn to include gloves and eye protection. Respiratory protection is recommended. Containment of the work area is not required, but dust suppression methods are recommended.

Level 2: Mid-Sized Isolated Areas (10-30 square feet)



Remediation can be conducted by In-House by qualified personnel. Proper PPE shall be worn to include gloves and eye protection. Respiratory protection is recommended. Containment of the work area is not required, but surfaces in the work area that could become contaminated should be covered with secured plastic sheet(s) and dust suppression methods are required.

Level 3: Large Isolated Areas (30-100 square feet)

OHSO, Facilities Management, Physical Plant, or Custodial Services can begin remediation activities. It may be determined that an approved remediation contractor, industrial hygienists, and/or professional consultant with experience performing microbial investigations and/or mold remediation consulted prior to remediation activities.

OHSO staff and personnel shall provide oversight for the project. Proper PPE shall be worn to include gloves and eye protection. Respiratory protection is recommended. Impermeable boots or shoe covers may be required. Containment of the work area may not be required, but surfaces in the work area that could become contaminated shall be covered with secured plastic sheet(s) and dust suppression methods are required.

Level 4: Extensive Contamination (greater than 100 square feet)

An approved remediation contractor, industrial hygienists, and/or professional consultant with experience performing microbial investigations and/or mold remediation consulted prior to remediation activities.

OHSO staff and personnel shall provide oversight for the project.

TYPES OF WATER INTRUSION ISSUES

I. Roof Leaks, Pipe Breaks, and Condensation

Water intrusion of this type usually comes from an overhead source. Water loss and leaks from a roof, plumbing, or equipment shall be fixed as soon as possible by qualified personnel.

Prevent moisture due to condensation by increasing surface temperature or reducing the moisture level in air (humidity). To increase surface temperature, insulate or increase air circulation. To reduce the moisture level in air, repair leaks, increase ventilation (if outside air is cold and dry), or dehumidify (if outdoor air is warm and humid).

Moisture-generating appliances, mechanical equipment, and HVAC systems drip pans, condensers, ventilators, and water pumps shall be kept clean, unobstructed, and in proper working condition.

II. Sewer Line Back-up

Areas affected should have restricted access until the problem is identified, addressed, and the area cleaned. Once it is determined the problem has been corrected, clean-up of the impacted area(s) can begin.

Any porous item that has come into contact with sewage tainted water is considered contaminated and must be discarded. This includes carpet, drywall, and ceiling tiles as well as other items such as books and paper products. Certain materials that can be cleaned and sanitized may remain in place.

Non-porous items can usually be cleaned, sanitized, and may remain in place.

III. Water Intrusion through the Building Envelope

This problem will typically occur along exterior facing walls when an aspect of the wall's structural make-up has failed. Improper landscaping, poorly installed or broken gutters, and ground water can



direct water into or under a building. Water will migrate through the wall over time from the exterior to the interior surface where paint damage or efflorescence will often result. Water trapped behind the paint film, wallpaper, or items attached to the wall can lead to hazards.

Delayed or insufficient maintenance may contribute to moisture problems in buildings. Improper maintenance and design of building heating/ventilating/air-conditioning (HVAC) systems, such as insufficient cooling capacity for an air conditioning system, can result in elevated humidity levels in a building.

These issues must be individually assessed so that a satisfactory corrective action can be formulated.

HAZARDS

To avoid potential hazards as a result of a water intrusion event, several procedures should be conducted.

1. Indoor humidity should be below 60% relative humidity (RH), preferably at 30%-50% RH.
2. Regularly scheduled inspections of building components and HVAC systems should be performed.
3. Clean and dry wet or damp spots within 48 hours.
4. Promptly solve and eliminate water and moisture problems before additional hazards arise.

If it is suspected or evidence is observed of any on the following hazards, call SOS.

I. Damp and Water Damaged Building Materials

Over time, if building materials remain damp or wet, the structural integrity of such components may become compromised.

Additionally, damp or wet building components and furnishings may release chemicals indoors, such as volatile organic compounds. Various odors may result and worsen with time if impacted areas remain wet or damp.

II. Pests

Damp building materials and furnishings may attract rodents and other pests, such as dust mites and cockroaches. Many pests can cause further damage to building materials and furnishings. Additionally, pests can introduce physical and biological hazards within the indoor environment.

III. Bacteria, Viruses, and Pathogens

Category 2 and Category 3 water intrusion events can introduce biological hazards, such as bacteria, viruses, and pathogens. It is critical that these events be reported immediately, and corrective action implemented as soon as possible to prevent further contamination or potential health risks.

IV. Mold

Mold is a type of fungi that is naturally occurring and can be found in various indoor and outdoor environments year-round. If mold is introduced to an indoor environment and left unchecked, mold gradually causes building material and structural damage, damage to furnishings, and impacts indoor air quality (IAQ). Please see UVM's [Indoor Air Quality Response Program](#) for more information regarding indoor mold growth.

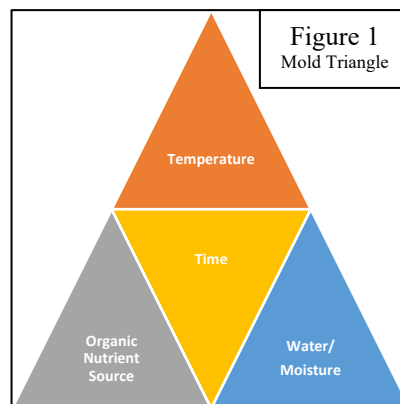
If key variables are present (Figure 1), mold can grow on various types of materials, such as dust, food, potted plants, furnishings, wood, paper products, insulation, carpet, and other building materials.

Water and moisture levels are elements that can be controlled to prevent indoor mold growth.



Potential health concerns are important reasons to prevent mold growth and remediate existing areas impacted by mold growth. Contact and inhalation of structural members, spores, proteins, enzymes, and mycotoxins from mold can cause various health effects. Even dead mold can cause adverse health effects.

Please note that molds come in many colors including white. Marketing and news media terms "Black mold" and "toxic mold" used are not a species or specific kind of mold and can be misleading. All mold under the right conditions has the potential to cause building damage and health effects.



RESPONSE AND COMMUNICATION

Prompt response and effective communication between UVM Personnel is an essential component of all remediation efforts. The building occupants shall be notified in the affected area(s). Conditions shall determine if building occupants will need to be relocated during remediation activities.

OHSO, in collaboration with Facilities Management, and approved vendors, will manage and conduct the following activities:

I. Gather Information

1. Determine the source of the water problem.
2. Confirm with zone manager or supervisor is notified and able to identify, alleviate or isolate the problem, or fix as soon as possible.
3. Survey the structure including pre-existing damage.
4. Develop a preliminary determination.
5. Notify all applicable building contacts as needed.
6. Continue communication with the building occupants as appropriate addressing all concerns.
7. *Confirm Risk Management is notified for all losses over \$1000.00.*

II. Determine extent of moisture and migration

1. Perform a moisture inspection and map the migration.
2. Document the extent of water migration within the structure, systems, and contents.
3. Inspect rooms adjoining wet areas.
4. Use of moisture metering and thermal imaging devices to show flow patterns.

CORRECTIVE ACTIONS AND RESTORATION ACTIVITIES

The purpose of remediation is to remove the source and hazards to prevent occupational exposure and damage to building materials and furnishings. Remediation includes both the identification and correction of the conditions that permit unsafe work conditions and environment, as well as the steps to remove damaged materials safely and effectively.

Currently, there are no federal or Vermont regulations, certifications, or licensing for water and mold remediation. Experienced professional judgement and best industry standards should be utilized when responding to water intrusion events.

The category of water, class of water, and level of mold determines if an approved vendor is required to conduct remediation activities or if the work can be conducted In-House.



I. Remediation

Following an assessment to determine the extent of materials impacted by the water and moisture, mold, or other hazards, a remediation plan can be implemented. The remediation plan should include steps to permanently correct the water or moisture problem. The plan should also cover the use of appropriate personal protective equipment (PPE) to be used.

Important – Prior to building materials being disturbed, removed, and disposed of, the EHS – Environmental Safety and Compliance Office (ESC) shall be consulted to confirm that building materials are negative for asbestos. Please refer to UVM’s [Asbestos Management Program](#) for more information.

OHSO, in collaboration with Facilities Management, and approved vendors, will manage and conduct the following activities:

1. Eliminate the primary water source. A repair plan should be carried out as appropriate to fix any water or humidity problems.
2. Establish a dry standard and a drying goal for impacted building materials and loose items.
3. Ensure all electrical equipment is supplied power through a GFCI.
4. Extract and remove standing and surface water.
5. Relocation of non-impacted furnishings or other loose items in an effort to preserve unaffected or salvageable property.
6. Porous materials will have to be assessed and be completely dried as quickly as possible, under these circumstances: (1) If it has been wet for less than 48 hours, and (2) is wet due to Category 1 water.
7. If materials cannot be properly dried or conditions deem otherwise, they need to be removed, disposed of properly, and replaced as soon as possible.
8. Damaged materials should not be left in place, covered, or painted over due to the high probability of potential mold growth and other hazards developing.
9. Areas should be properly cleaned and dried as per the best industry practices. Refer to **Table 1 and Table 2** ([Appendix A](#)) for guidelines for response to Category 1 “clean” water damage within 24-48 hours to prevent or likely to have mold growth or other hazards.

Additionally, a remediation plan should include steps to carefully contain and remove contaminated or moldy items and building materials in a manner that will prevent further contamination:

1. Do not eat or drink in the affected areas.
2. Do not run the HVAC system if you know or suspect that it is contaminated with mold or other hazards, as it could spread contamination throughout the building.
3. Remediators should avoid exposing themselves and others to mold-laden dust or particulates as they conduct their cleanup activities.
4. When possible, remediation activities should be scheduled during off hours when building occupants are less likely to be affected.
5. Porous materials that are wet, are contaminated, or have mold growing on them may have to be discarded, as porous materials are difficult or impossible to remove completely.
6. If hidden mold or other hazard is discovered, the remediation plan should be revised to account for the total area affected area.
7. Appropriate personnel will determine whether containment of the work area is required.
8. The work area and areas used by remediation workers for egress should be cleaned with a damp cloth or mop and a detergent solution and HEPA vacuumed.
9. All areas should be left dry and visibly free from contamination and debris.



II. Equipment

There are several types of equipment which are useful in assessments and remediation. Common items include:

Moisture Meters	Moisture meters measure/monitor moisture levels in building materials and may be helpful for measuring the moisture content in a variety of building materials following water damage. They also can be used to monitor the progress of drying damaged materials. Moisture meters can be used on materials such as carpet, wallboard, wood, brick, and concrete.
Dehumidifiers and Fans	It is crucial that equipment is set up and arranged in a manner to expedite the drying of building materials and contents.
Borescopes	A borescope can be used to assess the problems inside walls, ceiling plenums, crawl spaces, and other tight areas.
HEPA Filtered Fan Units	It is crucial that equipment is set up and arranged in a manner to reduce respirable particulates, nuisance dust, and other hazards from leaving the work area and eliminate further contamination.

III. Clean Up Methods

A variety of cleanup methods are available for remediating damage to building materials and furnishings caused by moisture control problems and mold growth. The type of material will determine the recommended methods used.

Types of materials:

- Non-porous materials (e.g., metal, glass, hard plastics, etc.) can be dried out, fully cleaned and reused.
- Semi-porous materials (e.g., wood and concrete), if structurally sound, can be cleaned and if necessary, disinfected.
- Porous materials (e.g., drywall, carpets, insulation, ceiling tile, etc.) are very difficult to fully clean because water and contaminants penetrate into them. Generally, if a porous material has been wet for over 48 hours, it is best to remove and replace it.

Clean up methods used include the following:

UVM Personnel will reframe from using biocides, which includes fungicides, pesticides, and chlorine bleach for mold cleanup. Biocides are toxic to animals and humans, and simply killing mold does not eliminate potential health risks.

Wet Vacuums	used for water extraction on saturated flooring materials and where water has accumulated. They should only be used when materials are still wet to avoid spreading spores. The tanks, hoses, and attachments shall be thoroughly cleaned and dried after each use to prevent contamination while moved and stored.
Damp Wipe	wiping and scrubbing with water and a mild detergent product on nonporous surfaces. Surfaces should be dried as quickly as possible. Cleaning product's label and manual instructions shall be referred to for cleaning instructions.
HEPA Vacuums	High-Efficiency Particulate Air (HEPA) vacuum can be used for final cleanup once impacted materials and surrounding areas are properly decontaminated



and dried. Proper precautions shall be used when changing the filter, bags, or cleaning the canister, hoses, and attachments. Filters and contents of the HEPA vacuum must be disposed of in an impermeable waste bag or container in a manner that prevents further indoor contamination. It is recommended that emptying and cleaning the HEPA vacuum occur outside.

Disposal

Building materials and furnishings contaminated or with mold growth that are not salvageable should be placed in sealed impermeable bags or closed containers and brought to an outdoor trash receptacle. These materials can usually be discarded as ordinary construction waste.

IV. Containment

Hazardous agents, such as bacteria, viruses, mold, and moldy debris should not be allowed to spread to areas in the building beyond the contaminated site. Based on professional judgement, the size and the extent of contamination will determine the level of containment required. Equipment and materials that can be utilized to build a work area containment include:

- Polyethylene sheeting.
- Duct tape or comparable tape. Spray adhesives are not recommended, as they can cause damage to paint and other finishes.
- Metal or wood framing to erect or attach polyethylene sheeting to.
- HEPA filtered fan unit exhausted to exterior of building.
- Airlock chamber.

V. Project Monitoring

OHSO, in collaboration with Facilities Management, and approved vendors, will perform project monitoring to include the following activities:

1. Document the extent of progress of the project.
2. Drying equipment (fans and dehumidifiers) shall be inspected once every twenty-four (24) hours.
3. Use of moisture meter and thermal imaging devices equipment to track and monitor drying process.
4. A remediation project will be classified as complete when the following criteria have been met:
 - a. The water source or humidity problem has been identified and addressed.
 - b. Building materials, if applicable, have been repaired or replaced.
 - c. When performing restorative drying, the moisture content of should be reduced to the following acceptable levels:

Substrate	Moisture Content (%)
Gypsum Wallboard (sheetrock/drywall)	≤ 12
Hardwood Flooring	7 – 10
Framing Lumber	15 – 19

- d. Building occupants can safely reoccupy the areas.

VI. Sampling

Experienced professional judgement and best industry standards should be utilized when testing for potential microbial, biological, or mold hazards. Additionally, sampling only provides “snapshot” information only for the moment in time in which the sampling occurred.



Pertaining specifically to mold, currently there are no federal or Vermont regulations, certifications, or licensing for mold testing since threshold limits regarding exposure to mold or mold spores have not been set in the State of Vermont or other federal regulations, sampling cannot be used to check a building's compliance with mold standards.

If visible apparent mold growth or other hazards are observed, sampling is unnecessary, and a remediation plan shall be implemented. Sampling should be undertaken only after careful delineation of the sampling goals. Sampling may be considered in specific instances, such as:

- Source(s) of mold contamination is unclear.
- Health concerns are evident or following a medical diagnosis.
- Cases where litigation is involved.
- Following a remediation project.

OHSO shall provide a sampling plan and oversight for the collection of samples. Sampling may consist of air samples, surface samples, and in some cases bulk or water samples. Experienced professional judgement by OHSO or a hired vendor will be considered in interpretation of analytical results from sampling.

PERSONAL PROTECTIVE EQUIPMENT

UVM Personnel shall utilize PPE during water intrusion response actions to prevent contact with eyes or skin, inhalation, or ingestion of hazards agents, such as bacteria, viruses, mold spores and structures. For specific information on PPE guidelines, please see UVM's [PPE Program](#).

I. Eye and Skin Protection

Gloves protect the skin from contact with hazards agents, as well as from potentially irritating cleaning solutions. Long gloves that extend to the middle of the forearm are recommended. The glove material should be selected based on the type of substance/ chemical being handled. To protect your eyes, use properly fitted goggles or a full-face piece respirator. Goggles must be designed to prevent the entry of dust and small particles. Safety glasses or goggles with open vent holes are not appropriate.

II. Protective Clothing

Appropriate personal protective clothing is recommended to minimize cross-contamination between work areas and clean areas, to prevent the transfer and spread of mold and other contaminants to street clothing, and to eliminate skin contact with mold and potential chemical exposures. Disposable protective clothing can include paper coveralls, head and foot coverings, or a body suit made of a breathable material, such as TYVEK®. Disposable protective clothing should be discarded after it is used.

III. Respiratory Protection

It is recommended that either a N95 disposable filter facepiece, half mask, or full-face piece air-purifying respirator (APR) be used. A full-face piece respirator provides both respiratory and eye protection.

N100, R100 or P100 filters are recommended. A charcoal-impregnated filter may be used for nuisance odors.

Direct any questions or concerns regarding PPE to OHSO.



RECORDKEEPING

I. Project Records

Water intrusion-related Work Orders in UVM's Integrated Work Management Software (IWMS) [Planon](#) are held and maintained by Facilities Management and OHSO.

OHSO will retain all indoor air quality reports and exposure monitoring.

II. Training Records

Training records will be maintained within personnel training files within the department the UVM Personnel works in. Applicable training records can be filed and stored within the OHSO.

The training record must include the date and time of training, name of trainer/instructor, and name of UVM Personnel.

Contact OHSO for more information on training requirements and scheduling.



APPENDIX A

TABLES

Table 1: Water Damage Cleanup and Mold Prevention

Guidelines for Response to Clean Water (Category 1) Damage within 24-48 Hours to Prevent Mold Growth*	
Water Damaged Material	Action
Books and loose papers	• For non-valuable items, discard books and papers. • Photocopy valuable/important items, discard originals. • Freeze (in frost-free freezer or meat locker) or freeze-dry.
Carpet and backing	• Dry within 24-48 hours. • Remove water by water extraction vacuum. • Reduce ambient humidity levels with dehumidifier. • Accelerate drying process with fans, and heaters if feasible. Use caution when using heaters. • Replace carpet if contaminated with Category 3 water.
Ceiling tiles	• Confirm it is asbestos containing material (ACM) or not. • Discard properly and replace.
Cellulose Insulation	• Discard properly and replace.
Concrete, cinder blocks, or concrete masonry units (CMU)	• Remove water by water extraction vacuum. • Reduce ambient humidity levels with dehumidifier. • Accelerate drying process with fans, and heaters if feasible. Use caution when using heaters. • Confirm substrate under flooring material is dry; dry substrate if necessary.
Fiberglass Insulation	• Discard properly and replace.
Hard surface, porous flooring material (linoleum, ceramic tile, vinyl)	• Remove excess water by water extraction vacuum or damp wipe/mopping. • Clean and allow to dry; accelerate drying process with fans, and heaters if feasible. Use caution when using heaters. • Confirm substrate under flooring material is dry; dry substrate if necessary.
Non-porous hard surfaces (plastics, metals)	• Remove excess water by water extraction vacuum or damp wipe/mopping. • Clean and allow to dry; accelerate drying process with fans, and heaters if feasible. Use caution when using heaters. • Confirm substrate under flooring material is dry; dry substrate if necessary.
Upholstered furniture	• Remove water by water extraction vacuum. • Reduce ambient humidity levels with dehumidifier. • Accelerate drying process with fans, and heaters if feasible. Use caution when using heaters. • May consult with a restoration/water damage professional who specializes in furniture if difficult to properly dry within 48 hours or if the piece is valuable.



Guidelines for Response to Clean Water (Category 1) Damage within 24-48 Hours to Prevent Mold Growth*	
Water Damaged Material	Action
Wallboard (drywall, gypsum board, Sheetrock, Masonite, pressed board)	• Reduce ambient humidity levels with dehumidifier. • Accelerate drying process with fans, and heaters if feasible. Use caution when using heaters. • If removal or disturbance of building materials must occur, confirm it is asbestos containing material (ACM) or not. • If can dry within 24-48 hours, may be dried in place if there are no swelling or damaged seams observed. Baseboard or covebase materials can be removed and put back following confirmation wallboard material is properly dried. • For periods longer than 48 hours, dispose of properly and replace. • For Category 3 water, dispose of properly and replace.
Window Drapes, throw rugs, loose fabrics	• Follow laundering or cleaning instructions recommended by the manufacturer. • For Category 3 water, it may be difficult to clean properly. It's recommended to dispose of properly and replace.
Wood surfaces	• Remove water by water extraction vacuum. • Reduce ambient humidity levels with dehumidifier. • Accelerate drying process with fans, and heaters if feasible. Use caution when using heaters. • Treated or finished wood surfaces may be cleaned with mild detergent and clean water and allowed to dry. • Wood paneling should be pried away from wall for drying.
* If mold growth has occurred or materials have been wet for more than 48 hours, consult Table 2 guidelines. Even if materials are dried within 48 hours, mold growth may have occurred. Items and ambient air may be tested by professionals if there is doubt. Note that mold growth will not always occur after 48 hours; this is only a guideline. These guidelines are for damage caused by clean water. If you know or suspect that the water source is contaminated with sewage, or chemical or biological pollutants, then Personal Protective Equipment and containment are required by OSHA. An experienced professional should be consulted if you and/or your remediators do not have expertise remediating in contaminated water situations. Do not use fans before determining that the water is clean or sanitary. If a particular item(s) has high monetary or sentimental value, you may wish to consult a restoration/water damage specialist.	

Table 2: Guidelines for Remediating Building Materials with Mold Growth Caused by Clean Water*

Material or Furnishing Affected	Cleanup Methods†	Personal Protective Equipment	Containment
SMALL – Total Surface Area Affected Less Than 10 square feet (ft²)			
Books and papers	3	Minimum N-95 respirator, gloves, and goggles recommended	None required
Carpet and backing	1, 3		
Concrete or cinder block	1, 3		
Hard surface, porous flooring (linoleum, ceramic tile, vinyl)	1, 2, 3		
Non-porous hard surface (plastics, metals)	1, 2, 3		
Upholstered furniture and drapes	1, 3,		
Wallboard (drywall, gypsum board)	3		
Wood surfaces	1, 2, 3		
MEDIUM – Total Surface Area Affected Between 10 and 100 ft²			
Books and papers	3	Limited to Full Use professional judgment, consider potential for remediator exposure and size of contaminated area. N-95 respirator, gloves, and goggles	Limited Use professional judgment, consider potential for remediator/occupant exposure and size of contaminated area.
Carpet and backing	1, 3, 4		
Concrete or cinder block	1, 3		
Hard surface, porous flooring (linoleum, ceramic tile, vinyl)	1, 2, 3		
Non-porous hard surface (plastics, metals)	1, 2, 3		
Upholstered furniture and drapes	1, 3, 4		
Wallboard (drywall, gypsum board)	3, 4		
Wood surfaces	1, 2, 3		
LARGE – Total Surface Area Affected Greater Than 100 ft² or Potential for Increased Occupant or Remediator Exposure During Remediation Estimated to be Significant			
Books and papers	3	Full Use professional judgment, consider potential for remediator exposure and size of contaminated area.	Full Use professional judgment, consider potential for remediator/occupant exposure and size of contaminated area.
Carpet and backing	1, 3, 4		
Concrete or cinder block	1, 3		
Hard surface, porous flooring (linoleum, ceramic tile, vinyl)	1, 2, 3, 4		
Non-porous hard surface (plastics, metals)	1, 2, 3		
Upholstered furniture and drapes	1, 3, 4		
Wallboard (drywall, gypsum board)	3, 4		
Wood surfaces	1, 2, 3, 4		
* Use professional judgment to determine prudent levels of Personal Protective Equipment and containment for each situation, particularly as the remediation site size increases and the potential for exposure and health effects rises. Assess the need for increased Personal Protective Equipment, if, during the remediation, more			



Material or Furnishing Affected	Cleanup Methods†	Personal Protective Equipment	Containment
extensive contamination is encountered than was expected. Consult Table 1 if materials have been wet for less than 48 hours, and mold growth is not apparent. These guidelines are for damage caused by clean water. If you know or suspect that the water source is contaminated with sewage, or chemical or biological pollutants, then the Occupational Safety and Health Administration (OSHA) requires PPE and containment. An experienced professional should be consulted if you and/or your remediators do not have expertise in remediating contaminated water situations. † Select method most appropriate to situation. Since molds gradually destroy the things they grow on, if mold growth is not addressed promptly, some items may be damaged such that cleaning will not restore their original appearance. If mold growth is heavy and items are valuable or important, you may wish to consult a restoration/water damage/remediation expert. Please note that these are guidelines; other cleaning methods may be preferred by some professionals. CLEANUP METHODS Method 1: <u>Wet vacuum</u> (in the case of porous materials, some mold spores/fragments will remain in the material but will not grow if the material is completely dried). Steam cleaning may be an alternative for carpets and some upholstered furniture. Method 2: <u>Damp-wipe surfaces</u> with plain water or with water and detergent solution (except wood—use wood floor cleaner); scrub as needed. Method 3: <u>High-efficiency particulate air (HEPA) vacuum</u> after the material has been thoroughly dried. Dispose of the contents of the HEPA vacuum in well-sealed plastic bags. Method 4: <u>Discard</u> – remove water-damaged materials and seal in plastic bags while inside of containment, if present. Dispose of as normal waste. HEPA vacuum area after it is dried. PERSONAL PROTECTIVE EQUIPMENT (PPE) Minimum: Gloves, N-95 respirator, goggles/eye protection Limited: Gloves, N-95 respirator or half-face respirator with HEPA filter, disposable overalls, goggles/eye protection Full: Gloves, disposable full body clothing, head gear, foot coverings, full-face respirator with HEPA filter CONTAINMENT Limited: Use polyethylene sheeting ceiling to floor around affected area with a slit entry and covering flap; maintain area under negative pressure with HEPA-filtered fan unit. Block supply and return air vents within containment area. Full: Use two layers of fire-retardant polyethylene sheeting with one airlock chamber. Maintain area under negative pressure with HEPA-filtered fan exhausted outside of building. Block supply and return air vents within containment area. Table developed from literature and remediation documents including <i>Bioaerosols: Assessment and Control</i> (American Conference of Governmental Industrial Hygienists, 1999) and <i>IICRC S500, Standard and Reference Guide for Professional Water Damage Restoration</i> (Institute of Inspection, Cleaning and Restoration, 1999); see Resources List for more information.			