NCCentral UNIVERSITY
Environmental Health and Safety

Mold Management Plan

Version #1.1

Contents

I. Reference

U.S. EPA, Mold Remediation in School s and Commercial Buildings; September 2008
https://www.epa.gov/sites/default/files/2014-08/documents/moldremediation.pdf

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II. Purpose

The purpose of North Carolina Central University's (NCCU) Mold Management Plan is to inform Faculty, Staff, and Students of their respective roles and responsibilities in the recognition, prevention, remediation, and documentation of environmental growth and moisture incidents. While all steps are taken to prevent the formation of environmental growth in its buildings, mold spores are a naturally occurring substance, present in outdoor air, and no plan will ever entirely prevent the spores from occasionally finding a suitable spot to grow.

III. Introduction

Mold is a common term used to refer to fungal growth. Mold can be found almost any organic substance as long as water and oxygen are present. Molds produce spores which move through the indoor and outdoor air continually. When mold spores land on a damp spot, they may begin growing and digesting whatever they are growing on in order to survive. Because molds are naturally occurring they cannot be completely eliminated from any environment.

Mold exposure does not always present a health problem indoors; however, individuals who are sensitive to molds can experience allergic reactions and upper respiratory irritation. Certain molds produce mycotoxins, which have been suggested to contribute to respiratory problems such as rhinitis and persistent cough.

The key to mold control is moisture control and the goal is always to solve moisture problems before they become mold problems. The best way to control moisture is to report leaky plumbing, leaks and other moisture in buildings as soon as they are identified.

IV. Responsibilities

A. Faculty and Staff

The following information is provided to instruct Faculty and Staff on ways to prevent mold and what to do if mold or water is visible in their work spaces.

- Do not block wall heating and cooling units with items that impede the air flow

- Do not place items such as plants that hold moisture on top of heating or cooling vents or units
- Do not leave wet shoes or umbrellas on carpet where mold can grow
- Clean up spills of any kind of food or drink
- Remove trash and food containers from work area regularly
- Report all water intrusions within your space or any campus building to Facilities Operations by submitting a School Dude work order or reporting to your building manager.

B. Residential Students

Residential Life distribute information about potential mold growth in residence halls at the University to students at the beginning of each semester. Included in the information, are steps for what to do if mold is found or suspected.

Below is the information shared and key steps in prevention, early detection of mold growth in living spaces on campus, and instructions of what to do in the event that mold is found or how to request for an assessment.

- Do not open windows while heating or cooling units are operating. This will cause condensation and may contribute to mold growth.
- Do not leave wet or damp clothes, towels or shoes in closets. Set them out until completely dry
- Do not place potted plants or any other source of moisture on or around heating and cooling units
- Do not place bed or other items directly in front of the wall heating and cooling vents as this causes decreased air flow in the room.
- Report any water leaks or visible growth to Facilities Operations by submitting a School Dude work order.

C. Building Environmental Services (BES)

Members of the BES team play a critical role in the NCCU Mold Management Plan as they have eyes on

buildings across campus on a regular basis.

- During routine cleaning, visible growth in areas less than 10 sq. ft. should be cleaned to prevent growth from spreading
    - If water damage accompanies growth, clean and then report to Facilities Operations
- Report leaky plumbing, drainage problems, leaking roofs, etc. to Facilities Operations immediately
- Bag all materials that are contaminated with mold growth and discard as regular waste. It is important to package mold-contaminated materials in sealed bags before removal from the containment area to minimize the dispersion of mold spores throughout the building.
- Wear proper personal protective equipment for the job and the disinfectant used

D. Facilities Operations Maintenance Staff

- Correct and report any situation which could create conditions for mold growth such as leaking faucets, drainage problems, leaking roofs, etc.
    - Provide all information relating to the conditions found and steps taken to remediate and remove the mold and fix the water source in work order
- During routine maintenance, inspect HVAC systems for mold and/or moisture problems that could contribute to mold growth
- Treat and remove mold and mildew encountered during normal maintenance and inspection of mechanical spaces and other access controlled spaces
- Building materials and furnishings that are contaminated with mold growth and are not salvageable should be bagged or contained using polyethylene sheeting and tape before leaving the containment area to minimize the dispersion of mold spores throughout the building.

E. Environmental Health and Safety

- Review and revise this plan as necessary.
- Conduct the training as needed and maintain training records
- Perform site assessments as needed during different stages of the reported incident.

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- Provide assistance in PPE selection and use as required by the SDS of cleaning agent or other hazards
- Provide environmental assessment contractors when an assessment is deemed necessary

V. Mold Assessment and Sampling

EHS is able to provide a basic mold assessment if any of the following conditions exist:

- Visible growth inside
- Consistent moldy or musty smells within a building
- Known episodes of major leaks or flooding

To request this basic assessment you should submit the EHS Hazard and Incident Report Form. After this basic assessment, EHS will either report no findings or request that the building manager or occupant submit a School Dude work order. for cleaning or remediation.

Since no EPA or other federal limits have been set for mold or mold spores, air quality or surface sampling cannot be used to check a building's compliance with federal mold standards. EHS only recommends sampling on a case-by-case basis when visual inspection has not revealed mold source but musty odors or other indicators suggest the presence of mold or determine if an area has been adequately cleaned or remediated. In situations where mold sampling is recommended, EHS can suggest an appropriate industrial hygiene consultant to conduct the mold sampling and analysis.

VI. Mold Remediation

The first step in any mold remediation project is to positively identify the cause of the moisture that contributed to the growth – without this critical step the mold is likely to regrow. Potential sources include high humidity, low airflow, water leaks, maintenance issues, HVAC problems or condensation issues. A likely scenario of the remediation process looks like this:

It is desirable to remediate water damage effectively within 24-28 hours. This is why it is critical that personnel who observe these issues take the time to report them. Appendix A presents EPA strategies for this early response to water damage. These guidelines are designed to avoid the need for remediation of mold growth by taking quick action.

NCCU is equipped and trained to manage mold remediation where growth is caused by clean water with no biological or chemical contaminants that affect up to and including 100 ft^2 and where there is not increased risk of significant occupant or remediator exposure during the process (Appendix B). For spills classified as large or that do pose an increased risk for occupants or remediators, a professional biological cleaning service will be hired.

The EPA's Checklist for Mold Remediation can be a useful tool for managing the process efficiently and thoroughly (Appendix C).

VII. Personal Protective Equipment (PPE)

If mold and mold spores become airborne, the risk of respiratory exposure goes up. Actions that are likely to stir up mold include: breakup of moldy porous materials such as wallboard; invasive procedures used to examine or remediate mold growth in a wall cavity; actively stripping or peeling wallpaper to remove it; and using fans to dry items.

The primary function of PPE is to avoid inhaling mold and mold spores and to avoid mold contact with the skin or eyes.

A. Skin and Eye Protection

Gloves are required to protect the skin from contact with mold allergens (and in some cases mold toxins) and from potentially irritating cleaning solutions.

To protect your eyes, use properly fitted safety goggles designed to prevent the entry of dust and small particles. Safety glasses or goggles with open vent holes are not acceptable.

B. Respiratory Protection

Respirators protect workers from inhaling airborne mold, mold spores, and dust. All individuals using respiratory protection, including N95 masks must be trained, must have medical clearance, and must be fit-tested annually. In addition, each person must be enrolled in the NCCU Respiratory Protection Program.

Minimum

When cleaning up a small area affected by mold, you should use an N95 respirator. This device covers the nose and mouth and will filter out 95% of the particulates in the air.

Limited

Limited PPE includes use of a half-face or full-face air purifying respirator (APR) equipped with a HEPA filter cartridge. These respirators contain both inhalation and exhalation valves that filter the air and ensure that it is free of mold particles. Note that half-face APRs do not provide eye protection. In addition, the HEPA filters do not remove vapors or gases.

VIII. Education / Training

Students are provided information by Residential Life on how to report all building concerns. NCCU employees are trained according to their job duties with awareness training conducted as part of new employee safety training. Refresher training will be conducted whenever inadequacies in this plan are observed and noted.

In addition, EHS has prepared the NCCU Mold Fact Sheet for distribution to faculty, staff, and students.

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IX. Appendix A EPA Table 1 Guidelines for Cleanup and Mold Prevention

Guidelines for Response to Clean Water Damage within 24 – 48 Hours to Prevent Mold Growth*	
Water-Damaged Material†	**Actions**
Books and 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 with water extraction vacuum. * Reduce ambient humidity levels with dehumidifier. * Accelerate drying process with fans.
Ceiling tiles	* Discard and replace.
Cellulose insulation	* Discard and replace.
Concrete or cinder block surfaces	* Remove water with water extraction vacuum. * Accelerate drying process with dehumidifiers, fans, and/or heaters.
Fiberglass insulation	* Discard and replace.
Hard surface, porous flooring§ (Linoleum, ceramic tile, vinyl)	* Vacuum or damp wipe with water and mild detergent and allow to dry; scrub if necessary. * Check to make sure underflooring is dry; dry underflooring if necessary.
Non-porous, hard surfaces (Plastics, metals)	* Vacuum or damp wipe with water and mild detergent and allow to dry; scrub if necessary.
Upholstered furniture	* Remove water with water extraction vacuum. * Accelerate drying process with dehumidifiers, fans, and/or heaters. * May be difficult to completely dry within 48 hours. If the piece is valuable, you may wish to consult a restoration/water damage professional who specializes in furniture.
Wallboard (Drywall and gypsum board)	* May be dried in place if there is no obvious swelling and the seams are intact. If not, remove, discard, and replace. * Ventilate the wall cavity, if possible.

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Window drapes	* Follow laundering or cleaning instructions recommended by the manufacturer.
Wood surfaces	* Remove moisture immediately and use dehumidifiers, gentle heat, and fans for drying. (Use caution when applying heat to hardwood floors.) * Treated or finished wood surfaces may be cleaned with mild detergent and clean water and allowed to dry. * Wet 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 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 the Occupational Safety and Health Administration (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.

§ The subfloor under the carpet or other flooring material must also be cleaned and dried. See the appropriate section of this table for recommended actions depending on the composition of the subfloor.

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X. Appendix B EPA 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	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 surfaces (Plastics, metals)	1, 2, 3		
Upholstered furniture & drapes	1, 3		
Wallboard (Drywall and gypsum board)	3		
Wood surfaces	1, 2, 3		
MEDIUM – Total Surface Area Affected Between 10 and 100 (ft²)			
Books and papers	3	Limited or Full Use professional judgment, consider potential for remediator exposure and size of contaminated area	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 surfaces (Plastics, metals)	1, 2, 3		
Upholstered furniture & drapes	1, 3, 4		
Wallboard (Drywall and gypsum board)	3, 4		
Wood surfaces	1, 2, 3		

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LARGE – Total Surface Area Affected Greater Than 100 (ft^2) 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 surfaces (Plastics, metals)	1, 2, 3		
Upholstered furniture & drapes	1, 3, 4		
Wallboard (Drywall and gypsum board)	3, 4		
Wood surfaces	1, 2, 3, 4		

CLEANUP METHODS

Method 1: Wet vacuum (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: Damp-wipe surfaces with plain water or with water and detergent solution (except wood—use wood floor cleaner); scrub as needed.

Method 3: High-efficiency particulate air (HEPA) vacuum after the material has been thoroughly dried. Dispose of the contents of the HEPA vacuum in well-sealed plastic bags.

Method 4: Discard – 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 *Bioaerosols: Assessment and Control* (American Conference of Governmental Industrial Hygienists, 1999) and *IICRC S500, Standard and Reference Guide for Professional Water Damage Restoration* (Institute of Inspection, Cleaning and Restoration, 1999); see Resources List for more information.

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XI. Appendix C EPA Checklist for Mold Remediation in Schools and Commercial Buildings

Questions to consider before remediation

Yes ☐ No ☐ Are there existing moisture problems in the building?

Yes ☐ No ☐ Have building materials been wet more than 48 hours?

Yes ☐ No ☐ Are there hidden sources of water or is the humidity high enough to cause condensation?

Yes ☐ No ☐ Are building occupants reporting musty or moldy odors?

Yes ☐ No ☐ Are building occupants reporting health problems?

Yes ☐ No ☐ Are building materials or furnishings visibly damaged?

Yes ☐ No ☐ Has maintenance been delayed or the maintenance plan been altered?

Yes ☐ No ☐ Has the building been recently remodeled or has building use changed?

Yes ☐ No ☐ Is consultation with medical or health professionals indicated?

Investigate and evaluate moisture and mold problems

☐ Assess size of moldy area (square feet)

☐ Consider the possibility of hidden mold

☐ Clean up small mold issues and fix moisture problems before they become large problems

☐ Select remediation manager for medium or large size mold problem

☐ Investigate areas associated with occupant complaints

☐ Identify source(s) or cause of water or moisture problem(s)

☐ Note type of water-damage materials (wallboard, carpet, etc.)

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- [ ] Check inside air ducts and air handling unit
- [ ] Consult qualified professional if necessary

Communicate with building occupants at all stages of process as appropriate

- [ ] Designate a contact person for questions and comments about medium or large scale remediation as needed

Plan Remediation

- [ ] Adapt or modify remediation guidelines to fit your situation; use professional judgment
- [ ] Plan to dry wet, non-moldy materials within 48 hours to prevent mold growth (see EPA Table 1)
- [ ] Select remediation personnel who have the experience and training needed to implement the remediation plan and use PPE and containment as appropriate
- [ ] Select cleanup methods for moldy items (see EPA Table 2)
- [ ] Select Personal Protection Equipment (see EPA Table 2)
- [ ] Select containment equipment - protect building, occupants (see EPA Table 2)

Remediation of mold and moisture problems

- [ ] Fix moisture problem, implement repair plan and/or maintenance plan
- [ ] Dry wet, non-moldy materials within 48 hours to prevent mold growth
- [ ] Clean and dry mold materials (see EPA Table 2)
- [ ] Discard moldy porous items that can't be cleaned (see EPA Table 2)

For more information see www.epa.gov/mold

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