



CITY OF LOS ANGELES GUIDELINES FOR ASSESSMENT AND REMEDIATION OF MOLD

The information contained within this manual has been compiled from the following reference sources: The Environmental Protection Agency (EPA), The Centers for Disease Control (CDC), The California Department of Health Services (CA DHS), The New York Department of Health Services (NYDHS), American Conference of Governmental Industrial Hygienist (ACGIH) Guidelines for the Assessment of Bioaerosols in the Indoor Environment and the California Department of Occupational Safety and Health (CA DOSH). Please note that this document presents recommendations on mold assessment and remediation. Currently there are no United States Federal, California State or Los Angeles City regulations for evaluating potential health effects of fungal contamination and remediation. These guidelines are subject to change as more information regarding fungal contaminants becomes available. April 2005.

PERSONNEL DEPARTMENT
OCCUPATIONAL HEALTH AND SAFETY
DIVISION

Introduction

Molds are a group of organisms that belong to the kingdom Fungi. Fungi are neither animals nor plants and are classified in a kingdom of their own. Fungi include molds, yeasts, mushrooms and puffballs.

Molds live in the soil, on plants, and on dead or decaying matter. Molds are found in virtually every environment and can be detected, indoors and outdoors, year round. You are exposed to them daily in the air you breathe. Molds lack chlorophyll and must survive by digesting plant and other organic materials for food. Without molds, our environment would be overwhelmed with large amounts of dead plant matter.

Molds make tiny spores to reproduce, just as some plants produce seeds. These mold spores can be found in both indoor and outdoor air, and settled on indoor and outdoor surfaces. When mold spores land on a damp spot, they may begin growing and digesting whatever they are growing on in order to survive. Since molds gradually destroy the things they grow on, you can prevent damage to building materials and furnishings and save money by eliminating mold growth.

Moisture control is the key to mold control. Molds need both food and water to survive: since molds can digest most things, water is the factor that limits mold growth. Molds will often grow in damp or wet areas indoors. Common sites for indoor mold growth include bathroom tile, basement walls, areas around windows where moisture condenses, and near leaky water fountains or sinks. Common sources or causes of water or moisture problems include roof leaks, deferred maintenance, condensation associated with high humidity or cold spots in the building, localized plumbing failures or heavy rains, slow leaks in plumbing fixtures, and malfunction or poor design of humidification systems.

Health Effects

Molds can cause a variety of health problems such as allergic reactions, fungal infections, skin irritation, and aggravation of asthma symptoms. The types and severity of symptoms depend, in part, on the types of mold present, the extent of an individual's exposure, the ages of the individuals, and their existing sensitivities or allergies. Most workers will not be affected by molds. In almost all cases of allergic or other illnesses, the symptoms are temporary. A small percentage of people may experience longer recovery times. It must be pointed out that the symptoms described for exposure to mold can also be due to other causes such as bacterial or viral infections, or other allergies. Therefore, it is important to consult your doctor if you are concerned about your health.

Prevention

The key to mold control is moisture control. Solve moisture problems before they become mold problems! With this concept in mind, the Occupational Health and Safety

Division assigns responsibility to the Department that oversees the affect facilities. The following mold prevention tips should be practiced:

1. Fix leaky plumbing and leaks in the building envelope as soon as possible
2. Watch for condensation and wet spots. Fix source(s) of moisture problem(s) as soon as possible.
3. Maintain indoor humidity below 60% relative humidity (RH). *(ASHRAE standard recommends indoor RH be maintained between 30%-60%)
4. Keep HVAC drip pans clean, flowing properly, and unobstructed.
5. Perform regularly scheduled building/HVAC inspections and maintenance.
6. Clean and dry wet or damp spots within 48 hours.
7. Provide drainage and slope the ground away from the foundation. Don't let foundations stay wet.

In cases of emergency water intrusion (i.e. flooding) it is imperative that the designated maintenance department responds to such damage using the strategies presented in Table 1 (Taken from the EPA Guidelines to Mold Remediation in Schools and Commercial Buildings) within 24-48 hours. These guidelines are designed to help avoid the need for mold remediation by taking quick action before growth starts. Depending on the size of the area involved and resources available the responsible maintenance department may need to seek the professional assistance to dry the area as quickly as possible.

Table 1: Water Damage - 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	<ul style="list-style-type: none"> - 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[§]	<ul style="list-style-type: none"> - Remove water with water extraction vacuum. - Reduce ambient humidity levels with dehumidifier. - Accelerate drying process with fans.
Ceiling tiles	<ul style="list-style-type: none"> - Discard and replace.
Cellulose insulation	<ul style="list-style-type: none"> - Discard and replace.
Concrete or cinder block Surfaces	<ul style="list-style-type: none"> - Remove water with water extraction vacuum. - Accelerate drying process with dehumidifiers, fans, and/or heaters.
Fiberglass insulation	<ul style="list-style-type: none"> - Discard and replace.
Hard surface, porous flooring[§] (Linoleum, ceramic tile, vinyl)	<ul style="list-style-type: none"> - Vacuum or damp wipe with water and mild detergent and allow to dry; scrub if necessary. - Check to make sure under flooring is dry; dry under flooring if necessary.
Non-porous, hard surfaces (Plastics, metals)	<ul style="list-style-type: none"> - Vacuum or damp wipe with water and mild detergent and allow to dry; scrub if necessary.
Upholstered furniture	<ul style="list-style-type: none"> - Remove water with water extraction vacuum. - Accelerate drying process with dehumidifiers, fans, and/or heaters.

	<ul style="list-style-type: none"> - 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)	<ul style="list-style-type: none"> - 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.
Window drapes	<ul style="list-style-type: none"> - Follow laundering or cleaning instructions recommended by the manufacture.
Wood surfaces	<ul style="list-style-type: none"> - 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.
<p>* 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.</p> <p>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.</p> <p>† If a particular item(s) has high monetary or sentimental value, you may wish to consult a restoration/water damage specialist.</p> <p>§ The sub floor 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 sub floor.</p>	

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	<p>Limited or Full</p> <p>Use professional judgment, consider potential for remediator exposure and size of contaminated area</p>	<p>Limited</p> <p>Use professional judgment, consider potential for remediator/occupant exposure and size of contaminated area</p>
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		
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	<p>Full</p> <p>Use professional judgment, consider potential for remediator/occupant exposure and size of contaminated area</p>	<p>Full</p> <p>Use professional judgment, consider potential for remediator exposure and size of contaminated area</p>
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	1,2,4		
Wallboard (drywall and gypsum board)	3,4		
Wood surfaces	1,2,3,4		
Table 2 continued			

*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 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: 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

If the water intrusion source/cause is not identified and repaired/eliminated then mold growth can occur. Control the water and you control the mold.

Inspection, Assessment and Sampling

The presence of mold, water damage, or musty odors should be addressed immediately. A visual inspection is the most important initial step in identifying a possible contamination problem. The extent of any water damage and mold growth should be visually assessed. This assessment is important in determining remedial strategies. Ventilation systems should also be visually checked when appropriate, particularly for damp filters but also for damp conditions elsewhere in the system and overall cleanliness. Ceiling tiles, gypsum wallboard (sheetrock), cardboard, paper, and other cellulosic surfaces should be given careful attention during the visual inspection. The use of equipment such as a boroscope, to view spaces in ductwork or behind walls, a moisture meter, to detect moisture in building materials, or a digital camera may be helpful in identifying and recording sources of fungal growth and the extent of water damage.

Bulk or surface sampling is not required to undertake a remediation. Remediation (as described in the **Remediation** section) of visually identified fungal contamination should proceed without further evaluation. Air sampling for molds should not be a part of a routine assessment as well. This is because decisions about appropriate remediation strategies can usually be made on the basis of a visual inspection. Regardless what type of mold is present you should arrange for its removal. Regulations for determining what a permissible limit of mold in the air is have not been established. Air sampling methods for some fungi are prone to false negative results and therefore cannot be used to definitively rule out contamination. Under certain circumstances sampling may need to be collected. The City Of Los Angeles Personnel Departments Occupational Health and Safety Division may take samples for the following reasons:

- If an individual(s) has been diagnosed with a disease that is or may be associated with a fungal exposure (e.g. pulmonary hemorrhage/hemosiderosis, and aspergillosis).
- Air sampling may be necessary if there is evidence from a visual inspection or bulk sampling that ventilation systems may be contaminated. The purpose of such sampling is to assess the extent of contamination throughout a building.
- Air monitoring may be necessary if the presence of mold is suspected (e.g. musty odors) but cannot be identified by a visual inspection or bulk sampling (e.g. mold growth behind walls). The purpose of such air monitoring is to determine the location and/or extent of contamination.
- To identify the presence or absence of mold by surface sampling if a visual inspection is equivocal (e.g., discoloration, and staining).
- As determined by the Industrial Hygienist for the City Of Los Angeles.

It will be the responsibility of the City Industrial Hygienist, City Safety Engineer or the designated Safety Representative for the affected Department to conduct the inspection,

assessment, and sampling and make the recommendations for remediation to the designated maintenance department or their abatement contractor when necessary.

Remediation

In all situations, the underlying cause of water accumulation must be rectified or fungal growth will occur. Any initial water infiltration should be stopped and cleaned immediately. An immediate response (within 48 hours) and thorough clean up, drying, and/or removal of water damaged materials will prevent or limit mold growth. If the source of water is elevated humidity, relative humidity should be maintained at levels below 60% to inhibit mold growth. Emphasis should be on ensuring proper repairs of the building infrastructure, so that water damage and moisture buildup does not recur.

Three levels of abatement are described below. The size of the area impacted by fungal growth primarily determines the type of remediation. The sizing levels listed are based on professional judgment and practicality; currently there is not adequate data to relate the extent of contamination to frequency or severity of health effects. The goal of remediation is to remove or clean contaminated materials in a way that prevents the emission of fungi and dust contaminated with fungi from leaving a work area and entering an occupied or non-abatement area, while protecting the health of workers performing the abatement. The listed remediation methods were designed to achieve this goal, however, due to the general nature of these methods it is the responsibility of the people conducting remediation to ensure the methods enacted are adequate. The listed remediation methods are not meant to exclude other similarly effective methods. Any changes to the remediation methods listed in these guidelines, however, should be carefully considered prior to implementation.

Non-porous (e.g., metals, glass, and hard plastics) and semi-porous (e.g., wood, and concrete) materials that are structurally sound and are visibly moldy can be cleaned and reused. Cleaning should be done using a detergent solution. Porous materials such as ceiling tiles and insulation, and wallboards with more than a small area of contamination should be removed and discarded. Porous materials (e.g., wallboard, and fabrics) that can be cleaned, can be reused, but should be discarded if possible. All materials to be reused should be dry and visibly free from mold. Routine inspections should be conducted to confirm the effectiveness of remediation work.

The use of gaseous, vapor-phase, or aerosolized biocides for remedial purposes is not recommended. The use of biocides in this manner can pose health concerns for people performing the remediation as well as for people returning to the treated space if used improperly. Furthermore, the effectiveness of these treatments is unproven and does not address the possible health concerns from the presence of the remaining non-viable mold. The purpose of mold remediation is to remove the mold to prevent human exposure and damage to building materials and furnishings. It is necessary to remove the mold contamination, not just to kill the mold. Dead mold is still allergenic, and some dead molds are potentially toxic. In most cases, it is not possible or desirable to sterilize an

area; a background level of mold spores will remain in the air. These spores will not grow if the moisture problem in the building has been resolved.

Remediation efforts should be conducted during non-business hours whenever feasible.

Level I: Small Isolated Areas (10 contiguous sq. ft. or less)

- Regular building maintenance staff can conduct remediation. Such persons should receive training on proper clean up methods, personal protection, and potential health hazards. This training can be performed by a Health and Safety Professional or a person trained in microbial remediation as part of a program to comply with the requirements of the Cal-OSHA Hazard Communication Standard.
- Respiratory protection (e.g., N95 disposable respirator), in accordance with the Cal-OSHA respiratory protection standard, is recommended. Gloves and eye protection should be worn. Disposable coveralls are optional.
- The immediate work area should be unoccupied. Vacating people from spaces adjacent to the work area is not necessary but is recommended in the presence of infants, persons recovering from recent surgery, immune suppressed people, or
- people with chronic inflammatory lung diseases (e.g., asthma, hypersensitivity pneumonitis, and severe allergies).
- Containment of the work area is not necessary. Dust suppression methods, such as misting (not soaking) surfaces prior to remediation or sealing contaminated surfaces prior to removal, are recommended.
- Contaminated materials that cannot be cleaned should be removed from the building in a sealed plastic bag. There are no special requirements for the disposal of moldy materials.
- The work area and area used by remedial workers for egress should be cleaned with a damp cloth and or mop and a detergent solution.
- All areas should be left dry and visibly free from contamination and debris.

Level II: Mid-Sized Isolated Areas (10 – 100 contiguous sq. ft.)

- Regular building maintenance staff can conduct remediation. Such persons should receive training on proper clean up methods, personal protection, and potential health hazards. This training can be performed by a Health and Safety professional or a person trained in microbial remediation as part of a program to comply with the requirements of the Cal-OSHA Hazard Communication Standard.
- Respiratory protection (e.g., half face negative pressure air purifying respirator with P-100 HEPA filters), in accordance with the Cal-OSHA respiratory protection standard, is recommended. Glove, eye protection and disposable protective coveralls should be worn.

- The immediate work area should be unoccupied. Vacating people from spaces adjacent to the work area is not necessary but is recommended in the presence of infants, persons recovering from recent surgery, immune suppressed people, or people with chronic inflammatory lung diseases (e.g., asthma, hypersensitivity pneumonitis, and severe allergies).
- Cover using polyethylene sheeting from ceiling to floor affected area with a slit entry and covering flap; maintain area under negative pressure with HEPA filtered fan unit exhausted to the outside. Block supply and return vents within containment area.
- Dust suppression methods, such as misting (not soaking) surfaces prior to remediation or sealing contaminated surfaces prior to removal, are recommended.
- Contaminated materials that cannot be cleaned should be removed from the building in a sealed plastic bag. There are no special requirements for the disposal of moldy materials.
- The work area and areas used by remedial workers for egress should be HEPA vacuumed and cleaned with a damp cloth and or mop and a detergent solution.
- All areas should be left dry and visibly free from contamination and debris.

Level III: Extensive Contamination (greater than 100 contiguous sq. ft.)

A health and safety professional with experience performing microbial investigations should be consulted prior to remediation activities to provide oversight for the project. The following procedures at a minimum are recommended:

- Personnel trained in the handling of hazardous materials equipped with full-face respirators with HEPA cartridges (in accordance with Cal-OSHA respiratory protection standard) and disposable protective clothing covering both head and shoes should perform the work.
- Containment of the affected area: should include complete isolation of work area from occupied spaces using plastic sheeting sealed with duct tape (including ventilation ducts/grills, fixtures, and any other openings). The use of an exhaust fan with a HEPA filter to generate negative pressurization and airlocks and decontamination room should be used during the remediation.
- Contaminated materials that cannot be cleaned should be removed from the building in a sealed plastic bag. There are no special requirements for the disposal of moldy materials.
- The immediate work area should be unoccupied. Vacating people from spaces adjacent to the work area is not necessary but is recommended in the presence of infants, persons recovering from recent surgery, immune suppressed people, or people with chronic inflammatory lung diseases (e.g., asthma, hypersensitivity pneumonitis, and severe allergies).
- The outside of the bags should be cleaned with a damp cloth and a detergent solution or HEPA vacuumed in the decontamination chamber prior to their transport to uncontaminated areas of the building. The contained area and decontamination room should be HEPA vacuumed and cleaned with a damp cloth

and/or mop with a detergent solution and be visibly clean prior to the removal of isolation barriers.

- Air monitoring in accordance with NIOSH protocols for bio-aerosols should be conducted prior to occupancy to determine if the area is fit to reoccupy.

***Note:** Although the level of personal protection, engineering controls and work practices suggested in these guidelines is based on the total surface area contaminated and the potential for remediator and/or occupant exposure, professional judgment should always play a part in the remediation decisions. These remediation guidelines are based on the size of the affected area to make it easier for remediators to select appropriate techniques, not on the basis of health effects or research showing there is a specific method appropriate at a certain number of square feet. The guidelines have been designed to help construct a remediation plan. The remediation manager will then use professional judgment and experience to adapt the guidelines to particular situations.

How Do You Know When You Have Finished Remediation/Cleanup?

There is no easy answer. Ultimately this is a judgment call. The following conditions must first be met prior to clearing an area for re-occupancy:

1. You must have completely fixed the water or moisture problem.
2. Water damaged materials should be dried or removed as verified by moisture readings.
3. You should complete mold removal. Visible mold, mold damaged materials, and moldy odors should not be present.
4. Final air sampling is required on remediation projects over 100 square feet.
5. If you have sampled, the kinds and concentrations of mold and mold spores in the building should be similar to those found outside, once cleanup activities have been completed. (**Note:** See appendix A for air sampling guidelines on remediation projects greater than 100 square feet).
6. You should revisit the site shortly after remediation, and it should show no signs of water damage or mold growth.

Hazard Communication and Notification:

Communication with building occupants is essential for successful mold remediation. Some occupants will naturally be concerned about mold growth in their building and the potential health impacts. Occupant's perceptions of the health risk may rise if they perceive that information is being withheld from them. The status of the building investigation and remediation should be openly communicated including information on any known or suspected health risks.

Small remediation efforts will usually not require a formal communication process, but do be sure to take individual concerns seriously and use common sense when deciding whether formal communications are required. When fungal growth requiring large-scale remediation is found, the remediation manager should notify occupants on the affected area(s) of its presence. Notification should include a description of the remedial measures to be taken and a timetable for completion. Group meetings held before and after remediation with full disclosure of plans and results can be an effective communication mechanism. Try and resolve issues and occupant concerns as they arise. The four steps listed below should be followed while communicating during remediation:

- Establish that the health and safety of building occupants are top priorities.
- Demonstrate that the occupants' concerns are understood and taken seriously.
- Present clearly the current status of the investigation or remediation efforts.
- Identify a person whom building occupants can contact directly to discuss questions and comments about the remediation activities.

When building-wide communications are frequent and open, those managing the remediation can direct more time toward resolving the problem and less time to responding to occupant concerns.

Conclusion

In summary, the prompt remediation of contaminated material and infrastructure repair must be the primary response to mold contamination in city facilities. The simplest and most expedient remediation that properly and safely removes fungal growth from buildings should be used. In all situations, the underlying cause of water accumulation must be rectified or the fungal growth will recur. Emphasis should be placed on preventing contamination through proper building maintenance and prompt repair of water damaged areas.

Widespread contamination poses much larger problems that must be addressed on a case-by-case basis in consultation with the Occupational Health and Safety Division representative or the departmental safety specialist. Effective communication with building occupants is an essential component of all remedial efforts.

APPENDIX A

AIR SAMPLING GUIDELINES FOR FINAL AIR MONITORING AND BACKGROUND AIR SAMPLING ON ALL PROJECTS GREATER THAN 100 SQUARE FEET

Prior to starting any remediation project over 100 square feet background air samples should be taken for documentation and comparison purposes. Background samples should use the following guidelines.

- Use Zefon total spore cassettes
- Run sample for 10 minutes at a flow rate of 15 liters per minute
- Minimum 2 maximum 5 samples per workspace based on the size of the remediation area.
- Locate samples evenly throughout the workspace
- Take one sample outdoors as near the HVAC intake as possible. Avoid foliage and standing water.
- Include 1 field blank in the sample set.

After completion of the remediation and upon passing a thorough visual inspection air sampling for documentation to support a conclusive removal has occurred should take place. Air sampling should be done prior to removal of the containment and the HEPA negative air machines (2200 CFM units) shall run (in negative pressure mode) for a minimum of 12 hours after completion of the removal prior to beginning sampling. The negative air machines shall be turned off for a minimum of 30 minutes prior to the start of sampling and shall remain off for the duration of the sampling. After the completion of the sampling the negative air machines can be turned back on until final results are in and clearance is given by the City Industrial Hygienist. The following is a list of guidelines to use in setting up the air-sampling plan:

- Use total spore (i.e. Zefon) cassettes
- Run sample for 10 minutes
- Use a pump set with a flow rate of 15 liters per minute
- Minimum number of inside samples is 2 and maximum number of inside samples is 5 based on size of the remediation area
- Location of inside samples should be evenly distributed throughout the workspace
- 1 sample should be taken outdoors as near the HVAC intake as possible. Avoid locating near foliage and or standing water. Take another sample outside the isolation near the decontamination chamber entrance.
- Include 1 field blank in the sample set

If the remediation has passed a visual inspection and the final inside air sampling indicates number and types of spores found equal to or less than the out door sample the area can re-opened. Please note that 1 or 2 spores found inside the area and not outside do not necessarily reflect mold proliferation but is reflective of the normal variation found in natural spore distribution. If the inside area has a higher number of spores and or greater than three spores of a type not found outdoors then the area needs to be re-inspected, re-cleaned and re-sampled.