CREtelligent
Commercial Real Estate Due Diligence. Simplified.

MOISTURE MANAGEMENT PLAN

OPERATIONS AND MAINTENANCE (O&M) PROGRAM

Engaged By:

Client Name:

Client Company:

Client Address:

Order Number:

Date of Engagement:

Report Date:

Table of Contents

1.0 INTRODUCTION

This Moisture Management Plan (MMP) document provides guidance for moisture control, mold growth prevention and remediation. This MMP was designed to aid Site Name in the management of moisture for the property located at Property Address, in Property City, Property State. This guide will provide the following information:

- How to identify, respond to and manage water intrusion/moisture issues
- An understanding of mold (what it is, how to identify it, and potential health effects)
- How to prevent mold growth in multi-family residential dwellings
- Inspection procedures to be implemented during residential unit turnovers and in response to complaints
- How to make reasonable judgments as to whether mold clean-up can be handled in-house
- How to develop and/or evaluate an in-house remediation plan or evaluate a remediation plan submitted by an outside contractor
- Responsibilities of the Property Manager, Property Maintenance Supervisor, and Maintenance Personnel

Through the development and implementation of a prevention plan for outlining the necessary procedures for emergency situations, training, periodic inspections, testing and record keeping, an MMP can meet the needs of the facility in the management of moisture to minimize the potential for mold growth.

Implementation of the MMP Plan can provide a level of assurance that prudent measures are being taken to minimize the potential for exposure and/or conditions conducive for mold growth. Furthermore, this plan may serve as evidence that the owner is aware of the liabilities and outlines the steps that will be actively taken to minimize exposure potential.

It is important to note that this MMP Plan is based on observations and/or provided information indicating an existing condition, potential condition, or future occurrence of a moisture or mold issue. Furthermore, CREtelligent has not conducted a limited or comprehensive moisture or mold survey of the subject property. The MMP incorporates mold response and remediation guidance provided primarily by the Environmental Protection Agency (EPA) as well as guidance developed and provided by the National Multi Housing Council (NMHC), the U.S. Department of Labor, Occupational Safety and Health Administration (OSHA), the American Industrial Hygiene Association (AIHA), the Texas Department of Health (TDH), the New York City Department of Health and Mental Hygiene (NYCDOH), the New York Guidelines for Assessment of Fungi in Indoor Environments and numerous other organizations and agencies; however, the MMP is also designed to reflect the individual property's specific characteristics and situations.

According to the EPA, there has been an increase in the demand for information regarding safety and health concerns related to indoor air quality. Growths of molds (fungi) is a contributing factor to Indoor Air Quality (IAQ) pollution. Research indicates that the indoor environment of any building is a result of the interaction between the site, climate, building system, construction techniques, a variety of contaminant sources, and the building occupants. Growth of molds is a major contributing factor to IAQ pollution and one that has brought new concern although there are currently no consistent standards regarding molds in indoor air. Property owners are seeking to understand what

is required when mold contamination is discovered. The nature and extent of such contamination have resulted in several well-publicized lawsuits brought by residents against property owners and managers, claiming both personal and property damage caused by mold.

2.0 INFORMATION ABOUT MOLD

2.1 Molds in the Environment

Molds live in the soil, on plants, and on dead or decaying matter. Outdoors, molds play a key role in the breakdown of leaves, wood, and other plant debris. Molds belong to the kingdom Fungi, which means molds are neither plants nor animals. Unlike plants, molds lack chlorophyll and must survive by digesting plant, animal, or other organic materials for food. The environment would be overwhelmed with large amounts of dead plant matter without molds.

Molds reproduce by tiny spores, much like some plants produce seeds. These mold spores are found in both indoor and outdoor air and settle on indoor and outdoor surfaces. When mold spores settle on a damp spot, they may begin growing and digesting the material they settled upon in order to survive. Since molds gradually decompose the substrate they grow on and potentially cause adverse health effects, the method of prevention is to respond to water intrusion/moisture issues in a timely manner.

2.2 Building Related Molds

Molds can grow on many building materials, such as wood, paper (e.g. wallpaper, books, and wall board liners), carpeting and rugs, fabrics, upholstery, wall-board (gypsum), plaster, and some insulation materials. Mold can grow on organic dirt that accumulates on virtually any surface including concrete and cinder block. When molds grow indoors they produce spores. This may cause the indoor concentration of spores of a particular type of mold to be higher than the outdoor concentration, a condition known as indoor mold amplification.

Molds need both food and water to survive. Since molds can digest many building materials, water is the greatest factor that limits the growth of building-related mold. Moisture control is the key to preventing mold. Molds will generally grow in damp or wet areas indoors faster than outdoors. Common sites for indoor mold growth include bathroom surfaces, basement walls, and areas around windows where moisture condenses and near leaky water plumbing. Common sources or causes of water or moisture problems include the following:

- Roof leaks
- Deferred maintenance
- Condensation associated with high humidity or cold spots in the building
- Flooding due to plumbing failures or heavy rainfall
- Slow leaks in plumbing fixtures
- Malfunction or poor design of humidification systems
- Inadequate foundation sloping/drainage
- Renovations
- Uncontrolled humidity, particularly in hot, humid conditions

2.3 Hidden Molds

In some cases, indoor mold growth may not be obvious or visible. Mold may be growing on hidden surfaces, such as the back side of drywall, wallpaper, or paneling, the top of ceiling tiles, and the underside of carpets and carpet pads. Possible locations of mold can include pipe chases and utility tunnels, in addition to walls behind large pieces of furniture (where condensation forms), condensate drain pans inside air conditioners, and roof materials above ceiling tiles (due to roof leaks or insufficient insulation). Some building materials, such as dry wall with vinyl wallpaper or baseboard molding may act as a vapor barrier increasing the chance of moisture accumulation.

You may suspect hidden mold if a building area smells moldy/musty. The source may not be identifiable, particularly if there has been recent water damage and building occupants are reporting odors or health complaints. If there has been a water intrusion, it is reasonable to suspect that hidden mold may exist behind walls or underneath carpeting that was affected.

Investigating mold problems may be difficult and will require caution when the investigation becomes intrusive. For example, removal of wallpaper can lead to a massive release of spores from mold growing on the underside of the wallpaper. If you believe there may be a hidden mold problem, you should hire a professional that is experienced and equipped with the necessary precautions to contain and minimize a suspected release. Specialized equipment include: boroscopes, fiber optic cameras, and wall chase air sampling equipment.

3.0 HEALTH EFFECTS & SYMPTOMS ASSOCIATED WITH MOLD EXPOSURE

When moisture problems occur and mold growth results, building occupants may begin to report odors and a variety of health problems such as headaches, breathing difficulties, skin irritation, allergic reactions, and aggravation of asthmatic symptoms. All of these symptoms could potentially be associated with mold exposure. All molds have the potential to cause health effects. Molds produce allergens, irritants, and in some cases, toxins. Specific reactions to mold amplification can include the following:

- **Allergic Reactions**

  Inhaling or touching mold may cause allergic reactions in sensitive individuals. Some molds can act as sensitizers and cause a person to become allergic to molds, and in some cases, to other allergens. Allergic responses include hay fever symptoms such as running nose, sneezing, red eyes and skin irritation. Mold spores and fragments can produce allergic reactions in sensitive individuals regardless of whether the mold is dead (non-viable) or alive (viable).

- **Asthma**

  Molds can trigger asthmatic attacks in persons who are allergic (sensitized) to molds. The irritants produced by molds may also worsen or reveal asthmatic symptoms in non-sensitized individuals.

- **Irritant Effects**

  Mold exposure can cause irritation of the eyes, skin, nose, throat, and lungs, often in the form of a burning sensation.

- **Opportunistic Infections**

  People with weakened immune systems are potentially more vulnerable to mold based infections. *Aspergillus fumigatus*, for example, has been known to infect the lungs of immune-compromised individuals. These individuals inhale the mold spores, which then start growing in their lungs. *Trichoderma* has also been known to infect immune-compromised children.

  Healthy individuals are usually not vulnerable to opportunistic infections from airborne mold exposure. However, molds can cause respiratory distress and common skin diseases such as athlete's foot and yeast infections.

4.0 RESPONSE TO HEALTH COMPLAINTS RELATED TO MOLD EXPOSURE

Responding to building occupants' complaints in a timely manner is very important when potential mold exposures are an issue. Failing to do so could result in liability claims associated with environment-related illnesses. It is in the best interest of the owner/management to immediately respond to moisture and mold related complaints in a timely manner.

4.1 Response Actions

Several factors may influence the response actions taken by the property owner / management in response to occupant complaints. These factors may include the amount of mold observed, the source of the water intrusion into the occupied space, and the risk of exposure to the occupant(s). The appropriate level of response will vary significantly depending on the circumstances, and could include the following:

- Investigating sources of moisture intrusion and determining if water stains are from previous leaks that have been repaired or materials that are currently experiencing moisture intrusion;
- Retaining a qualified environmental consultant to conduct an assessment;
- Retaining a qualified building engineer or moisture intrusion specialist;
- Developing and implementing corrective actions (i.e. remediation);
- Performing quality assurance inspections and sampling to ensure the remediation is complete;
- Providing appropriate hazard communication for affected parties (i.e. renters, owners, employees, occupants), including notifying occupants of the actions that have been or will be taken to investigate and/ or remediate mold problems);
- Seeking or recommending medical advice for diagnosis, treatment or determination of symptoms. Individuals with persistent health problems should go to an allergist or occupational health clinic or see their physicians for a referral to practitioners who are trained in specialties related to health effects caused by mold exposures and are knowledgeable about these types of exposures.

4.2 Responsibilities

The owner of the property is ultimately responsible for all action and response to complaints that are made; however, management and maintenance staff are responsible for day to day operations and are typically delegated to handle property complaints and create resolutions to issues that may arise. The following are the responsibilities that are allocated to these individuals typically involved in the operations and maintenance of a multi-family residential dwelling:

The Building Manager has responsibility for overall implementation of the MMP. The Building Manager will assign most of the site-specific activities to the manager or maintenance supervisor. The Building Manager will also be responsible for determining the extent of a moisture-mold complaint and when to utilize a specialist such as a Certified Industrial Hygienist (CIH), Professional Engineer (PE), or Certified Microbial Consultant (CMC) to conduct an environmental assessment.

The manager or maintenance supervisor will direct maintenance personnel and contractors to ensure that the steps of the MMP involving site activities are implemented. The manager or maintenance supervisor will perform routine inspections of the building exterior walls, roof, public areas, grading, mechanical rooms, and electrical rooms. These inspections are performed on a regular basis (i.e. weekly or bi-monthly).

The manager or maintenance supervisor will perform inspections of each apartment whenever there is a turnover to a new tenant. Other individuals trained in moisture-mold inspections may assist the manager or maintenance supervisor with the inspections. The apartments will be inspected for visual indications of moisture damage and/or mold growth.

The maintenance supervisor is responsible for communicating to the Property Manager any concerns or issues such as leaking pipes leaks, indications of moisture damage, musty odors, and/or suspected health effects. The manager or maintenance supervisor will document the concern and/or complaint and investigate the concern. The manager or maintenance supervisor will then direct maintenance personnel and/or contractors as needed. The investigation, recommendations, and results will be documented in a report that is to be filed and maintained by the Property Manager.

If the concern is above the training and abilities of the maintenance supervisor, the maintenance supervisor will inform the Property Manager who will retain the services of an environmental specialist or other trained person to investigate the space and report their findings and recommendations to the manager or maintenance supervisor. The maintenance supervisor must be cognizant of the impetus to ensure drying is complete 48 hours after a water incursion. Anytime interior building materials are suspected of having been wet for more than 48 hours, the maintenance supervisor will contact the Property Manager. The Property Manager will determine if emergency drying and mold remediation services are warranted.

Tenants are responsible for immediately informing the manager or maintenance supervisor of any concerns within their apartment.

5.0 PREVENTING INDOOR MOLD

5.1 Amplification

In general, if indoor environments become wet and drying cannot be completed within 48 hours then mold growth and indoor amplification is likely. Moisture can penetrate rugs, carpeting, carpet padding, wallboard, plaster, upholstery, papers, and other items commonly found indoors. Appendix A provides guidelines for water damage cleanup. Responses for water damage to various materials such as ceiling tiles, concrete, and fiberglass insulation are listed in Appendix A. The key to successful prevention of mold growth is a timely response within the time frame of less than 48 hours. A quick, effective response to water leakage/damage is critical in preventing mold amplification within buildings.

Rapid response to moisture intrusion and good building maintenance are essential to preventing mold growth. Adherence to the following steps can help prevent mold amplification that can lead to costly remediation:

- Look for indications of water intrusion signs and microbial amplification during routine site visits;
- Fix leaky plumbing and leaks in the building envelope as soon as possible;
- Watch for condensation and wet spots. Fix source(s) of moisture problem(s) as soon as possible;
- Be cautious and aware of repairs of the roof or rooftop mechanical equipment or any building penetration;
- Know what building systems may be prone to condensation, such as windowpanes, water pipes, refrigerant systems, and air conditioning ducts;
- Clean, dry and/or remove anything that is water-damaged, particularly carpets and padding. If you are installing new wall-to-wall carpet over a concrete floor, be sure to have an effective moisture barrier installed beneath it. Area rugs are a better choice for mold prevention;
- Keep bathrooms dry and well ventilated. Remove mold growth using detergent or soap from nonporous items (such as plastic, metals, and tiles). Moldy porous items are generally impossible to clean and should be discarded in sealed plastic bags;
- Be aware of all appliances/processes which introduce moisture into a building space such as cooking, bathing, clothes washing/drying, humidification, refrigeration, ground moisture migration, saunas, steam baths, pools, houseplants, seasonal humidity, cooling towers, and other areas specific to your building;
- Keep hard surfaces clean and dry. Weekly light mopping of floors is recommended;
- Minimize the amount of plants within any space. Plants require frequent watering, which leads to spillage. Furthermore, potting soil provides an excellent source for mold growth;
- 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);
- Keep relative humidity (RH) below 70%, ideally between 30-60%. If a location experiences RH greater than 60% on a regular basis, then corrective measures should be employed such as dehumidifiers, exhaust fans, moisture barriers, or whatever is necessary to maintain acceptable conditions;

- Make sure bathroom vents, kitchen vents, and clothes dryer vents are properly positioned to exhaust to the outdoors. An exhaust leak into a wall chase, plenum, attic, or other hidden space can cause moisture to linger and promote mold growth;
- Ensure that the bathroom exhaust fans are adequate for the bathroom size. Exhaust fans indicate air exchange capacity in cubic feet per minute (CFM);
- In areas of known high humidity/condensation (i.e. bathrooms), refrain from using or storing carpeting, furniture or other soft material goods that can hold both dust and moisture;
- Minimize the storage of large amounts of unused materials in crawlspaces to maximize airflow in these areas;
- Keep air-conditioning coils and condensate drip pans clean, flowing properly, and unobstructed. Consider the use of biocide treatments if standing water is always an unpreventable issue. Ensure filters are cleaned or changed as warranted;
- Keep heating systems clean. Empty humidifier water trays and change/cleanse filters on an annual basis or according to manufacturers recommendations;
- Heating, cooling, humidifying, and dehumidifying systems that are owned and/or maintained by occupants can be, and often are, sources of bioaerosols. This equipment should always be inspected during complaint investigations, and occupants should be encouraged to perform proper maintenance;
- Try to maintain indoor temperatures between 72 and 77 degrees Fahrenheit to limit any growth and reduce the potential for condensation during the cooling season;
- Perform regular building inspections and maintenance as scheduled. Inspections should include, when applicable, site drainage, roof gutters and downspouts, building drains, plenums, musty odors, and indications of leaks. Inspect building penetrations monthly as a proactive measure;
- Clean and dry wet or damp spots within 48 hours. Porous building materials such as carpet, ceiling tiles, and wallboard that are wet for more than 48 hours or show signs of mold should be removed and replaced. Remove wallboard at least 24 inches beyond the visible extent of the mold;
- Check mechanical rooms and roofs for wet conditions, leaks, or spills;
- Don't let foundations stay wet. Provide adequate drainage and slope the ground away from the foundation. If water tends to pond against the building or on rooftops, take measures to prevent ponding.

5.2 Inspections

The property owner/manager should perform routine inspections of the building exterior walls, roof, public areas, grading, mechanical rooms, and electrical rooms. The owner/management should inspect each apartment for indications of moisture and mold whenever there is a turnover (new tenant). The manager or maintenance supervisor should be trained on visual indications of water damage and mold, use of a moisture meter and inspection mirror, typical sources of moisture such as toilets, sinks, washers and dryers, dryer vents, roof leaks, etc. The owner/management should be trained on follow-up inspections of areas where moisture damage has been established. The owner/management should be trained on investigating health and odor complaints and determining when to utilize a specialist, such as a Certified Industrial Hygienist (CIH), Professional Engineer (PE), or Certified Microbial Consultant (CMC) to conduct an environmental assessment.

Inspections of the exterior and non-rented areas are performed at least weekly. Apartments are inspected during turnover periods and whenever there is a complaint. Complaints are made directly to the manager or maintenance supervisor and inspections are typically initiated the same day.

Complaints of mustiness, dampness, or condensation will be addressed by the owner / management when that person feels they have accurately diagnosed the problem. For instance, the manager or maintenance supervisor may recommend opening the bathroom window when using the shower, and if necessary, installing a window fan or exhaust fan. If the manager or maintenance supervisor encounters moisture, mustiness, or condensation that they cannot account for or adequately correct, then they will bring the situation to the attention of the manager or maintenance supervisor. Personnel performing inspections are also expected to have a flashlight and inspection mirror. In many cases, the person performing the inspection may wish to clean up a small surface area with suspect mold, or cut a small inspection window into a wallboard.

The Interior Inspection Checklist (included in the appendices) is intended to help the owner / management to complete thorough inspections, including during apartment turnovers and in response to moisture or mold related complaints. Whenever deficiencies are noted, there needs to be a follow-up narrative. Reports on deficiencies, corrections, and follow-up reports should be maintained by the owner/management.

6.0 REMEDIATION OF MOLD PROBLEMS

The owner/management shall not perform remediation when affected surface areas exceed 10 square feet (sq. ft.) of mold damage. The owner / management will assess each mold situation to see if there is heavy growth on porous materials such as drywall, wood or plaster. In the event that there is thick or dense mold, the owner/management is encouraged to request assistance, even for areas with less than 10-sq. ft. of mold.

6.1 Remediation Planning

Prior to the performance of remediation activities, both by in house personnel and licensed professionals; the manager or maintenance supervisor should consider the following:

- Attempt to dry wet materials within 48 hours to prevent mold growth;
- Select cleanup methods for mold impacted items;
- Select Personal Protection Equipment (PPE) - protect remediation workers;
- Select containment equipment - protect building occupants;
- Select remediation personnel who have the experience and training needed to implement the remediation plan and employ adequate PPE, containment, waste containerization and disposal practices.

Additional details are outlined in EPA Table 1 and 2 of the Appendix. Please note that the information contained within the tables is EPA guidelines that were provided in the Freddie Mac Moisture Management Plan Handbook.

6.2 Remediation Procedures

Four levels of abatement are described below. The manager, maintenance supervisor and any staff that has not completed formal mold remediation training will only complete Level I remediation. The size of the area impacted by mold contamination primarily determines the type of remediation. The sizing levels below are based on professional judgment and practicality. Currently there is no adequate data to relate the extent of contamination to frequency or severity of health effects. The goal of remediation is to remove and/or clean contaminated materials in a contained area in order to prevent the spread of spores to unaffected areas. This is achieved through the use of engineering controls and industry standards in remediation methods. 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. 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 performed with a detergent solution. Porous materials such as ceiling tiles, insulation, and wallboards with more than a small area of contamination should be removed and discarded. Porous materials that can be cleaned, may 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 bleach or other biocides is questionable in most cases. The effectiveness of bleach in reducing living mold is dependent on concentration, residual chlorine levels, and contact time on the surface. All of these factors are difficult to control during remediation. Application of a biocide serves no purpose that could not be accomplished with a detergent or cleaning agent. The use of gaseous ozone or chlorine dioxide for remedial purposes is not recommended. Both compounds are highly toxic and contamination of occupied space may pose a health threat. Furthermore, the effectiveness of these treatments is unproven. Removal of all mold growth can generally be accomplished by the physical removal of impacted materials and thorough cleaning of non-porous materials. For additional information on the use of biocides for remedial purposes, refer to the American Conference of Governmental Industrial Hygienists' document, "Bioaerosols: Assessment and Control."

6.3 Four Remediation Levels

As previously mentioned, any on-site staff that has not completed formal mold abatement training (minimum of 24 hours of training followed by on-the-job training) should be limited to Level I abatements, as described below.

[Adapted from the New York City Department of Health (NYCDOH) Guidelines on Assessment and Remediation of Fungi in Indoor Environments (3) and EPA (1)]

Level I: Small Isolated Areas

Total surface area affected less than 10 square feet – (i.e., ceiling tiles, small areas on walls.)

Regular building maintenance staff, general contractors, and professional handymen can conduct this level of remediation. Such persons should receive training or demonstrate sufficient knowledge on proper cleanup methods, personal protection, and potential health hazards. This training can be performed as part of a program to comply with the requirements of the OSHA Hazard Communication Standard (29 CFR 1910.1200). Use of a dust mask (e.g., N95 disposable filtering face piece respirator), used in accordance with the OSHA respiratory protection standard is recommended. Gloves and goggles are part of the minimum Personal Protection Equipment (PPE) requirements for mold abatement. See Appendix for PPE guidance outlined in the *Materials and Equipment List*.

The 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 (less than 12 months old), 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 with a fungicide/mildew cleaner or equivalent, prior to remediation, are recommended. Contaminated materials that cannot be cleaned should be sealed and double-bagged in 6 millimeter plastic bags and removed.

The work area and areas used by remediation workers for egress should be cleaned with a damp cloth and/or mopped with a detergent solution. All areas should be left dry and visibly free from contamination and debris.

Level II: Medium

Total Surface Area affected between 10 and 100 square feet – (i.e., several wallboard panels.)

At a minimum the following procedures are recommended. Limited or Full protection may be required depending on the situation. The work area and areas directly adjacent should be covered with a single layer of 6 millimeter fire-retardant polyethylene sheeting and taped before remediation to contain dust/debris.

Seal ventilation ducts/grills in the work area and areas directly adjacent with 6-mil polyethylene sheeting. Use an exhaust fan with a High Efficiency Particulate Air (HEPA) filter to generate negative pressurization. The work area and areas directly adjacent should be unoccupied. Further vacating of people from spaces near the work area is recommended in the presence of infants (less than 12 months old), persons having undergone recent surgery, immune suppressed people, or people with chronic inflammatory lung diseases (e.g., asthma, hypersensitivity pneumonitis, and severe allergies).

Dust suppression methods such as misting (not soaking) surfaces prior to Remediation, are recommended. Contaminated materials that cannot be cleaned should be sealed and double-bagged in 6-mil plastic bags and removed. The work area and surrounding areas should be HEPA vacuumed (a vacuum equipped with a High-Efficiency Particulate Absolute filter) and cleaned with a damp cloth and/or mopped with a detergent solution.

All areas should be left dry and visibly free from contamination and debris. If abatement procedures are expected to generate a lot of dust (e.g., abrasive cleaning of contaminated surfaces, demolition of plaster walls) or the visible concentration of the mold is heavy (blanket coverage as opposed to patchy), then it is recommended that the remediation procedures for Level III be followed.

Level III: Large Area

Total Surface Area affected greater than 100 square feet or potential for increased occupant or remediation worker exposure during remediation is estimated to be significant.

The following procedures are recommended:

Completely isolate the work area from occupied spaces using double layers of polyethylene plastic sheeting sealed with duct tape including ventilation ducts/grills, fixtures, and any other openings. Utilize an exhaust fan with a HEPA filter to generate negative pressurization. Provide airlocks and a decontamination room.

The work area and areas directly adjacent should be unoccupied. Further vacating of people from spaces near the work area is recommended in the presence of infants (less than 12 months old), persons having undergone recent surgery, immune suppressed people, or people with chronic inflammatory lung diseases (e.g., asthma, hypersensitivity pneumonitis, and severe allergies).

Contaminated materials that cannot be cleaned should be sealed and double bagged in 6-mil plastic bags and removed. 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. Pre- and post-remediation sampling may also be useful in determining whether remediation efforts have been effective. After remediation, the types and concentrations of mold in the indoor air samples should be similar to what is found in the local outdoor air. Since no Federal limits have been set for mold or mold spores, sampling cannot be used to check a building's compliance with Federal mold standards. If any remediation sampling is deemed necessary contact your local industrial hygiene office or contact safety and health professionals with specific experience in designing mold sampling protocols, sampling methods, and interpretation of results.

Sample analysis should follow analytical methods recommended by the American Industrial Hygiene Association (AIHA) or the American Conference of Governmental Industrial Hygienists (ACGIH). The laboratory conducting the analyses should participate in the AIHA Environmental Microbiology Proficiency Analytical Testing (EMPAT) program.

Level IV: Remediation of HVAC Systems

HVAC systems are occasionally sources of mold amplification. The air conveyance system can have areas with mold growth, such as the area in and around the condensation collection pan or insulation that becomes wet. The air conveyance system can also be a reservoir of mold spores, often on interior insulation panels, baffles, or in dirt inside the ducts.

The cleanup of mold contamination inside air conveyance systems should always be performed with the system turned off. Professional duct cleaning contractors are often utilized since they are trained and equipped to prevent cross-contamination and replace insulation that is water damaged or excessively dirty. For a small area (<10 sq ft) follow Level I guidance for PPE and containment and for an areas (>10 sq ft) follow Medium (Level II) or when greater than 100 sq ft follow Large (Level III) guidance for PPE and containment. The air conditioner system should be shut down prior to any remedial activities.

Regular building maintenance staff can conduct this level of remediation. Such persons should receive training on proper cleanup methods, personal protection, and potential health hazards. This training can be performed as part of a program to comply with the requirements of the OSHA Hazard Communication Standard (29 CFR 1910.1200). Respiratory protection (e.g., N95 disposable respirator), used in accordance with the OSHA respiratory protection standard (29 CFR 1910.134), is recommended. Gloves and goggles should be worn.

The 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 (less than 12 months old), 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, are recommended. Growth supporting materials that are contaminated, such as the insulation of interior lined ducts and filters, should be removed. Other contaminated materials that cannot be cleaned should be sealed and double-bagged in 6-mil plastic bags and removed. Since there are no special disposal requirements for moldy materials, they can be discarded as ordinary construction waste. The work area and areas immediately surrounding the work area 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.

Areas of Contamination

(Total surface area affected greater than 3 square feet) inside an air conditioner or Heating Ventilation and Air Conditioning (HVAC) System.

The following procedures are recommended: The HVAC system should be shut down prior to any remedial activities. Completely isolate the work area from other areas. Isolate the HVAC system using double layers of polyethylene plastic sheeting sealed with duct tape (including ventilation ducts/grills, fixtures, and any other openings).

Utilize an exhaust fan with a HEPA filter to generate negative pressurization. Provide airlocks and a decontamination room. Growth supporting materials that are contaminated, such as the insulation of interior lined ducts and filters, should be removed. Other contaminated materials that cannot be cleaned should be sealed and removed in double bagged 6-mil plastic. When a decontamination room is present, the outside of the bags should be cleaned with a damp cloth and a detergent solution or HEPA vacuumed 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 and a detergent solution prior to the removal of isolation barriers. All areas should be left dry and visibly free from contamination and debris.

Pre- and post-remediation sampling may also be useful in determining whether remediation efforts have been effective. After remediation, the types and concentrations of mold in the indoor air samples should be similar to what is found in the local outdoor air. Since no Federal limits have been set for mold or mold spores, sampling cannot be used to check a building's compliance with Federal mold standards. If remediation sampling is necessary contact safety and health professionals with specific experience in designing mold sampling protocols, sampling methods, and interpretation of results. Sample analysis should follow analytical methods recommended by the American Industrial Hygiene Association (AIHA) or the American Conference of Governmental Industrial Hygienists (ACGIH).

Disposal of contaminated materials:

Since there are no special disposal requirements for moldy materials, they can be discarded as ordinary construction waste. However, in instances where the affected areas have asbestos-containing materials (ACM) and/or lead-based paint (LBP), the licensed and registered abatement contractor shall make the necessary notifications to the appropriate regulatory agencies (i.e. SCAQMD, Cal/OSHA & DHS) and proceed to remove, containerize and dispose of such affected materials adhering with current regulations outlined by the EPA and Cal/OSHA.

7.0 NOTIFICATION

7.1 Identification of a Problem and the Communication Chain

Management is typically on-site daily and has a telephone contact that is provided to tenants. The management also completes follow-up investigations to check building materials for moisture content and potential mold amplification a few days after remedial measures are undertaken.

7.2 Tenant Outreach Program

A Resident Tip Sheet: Mold Facts and Tips information sheet from the Freddie Mac Moisture Management Plan Handbook is included in the Appendix. It is recommended that this information is distributed to the tenants.

7.3 Hazard Communication

If mold is found in an occupied apartment, then the tenants shall be notified by the owner/management. If the mold is in a location where it could affect or be related to other apartments than those tenants would be notified and where appropriate, inspections would be extended to other apartments. Tenants would be notified of intended inspection and abatement efforts. If more than 10 square feet of mold were identified in a public area than all the tenants of the building would be notified of the presence of mold and the abatement schedule.

When mold growth requiring Level III or IV (large-scale) remediation is found, the owner/ management will notify occupants in the affected area(s) of its presence. Notification should include a description of the remedial measures to be taken and a timetable for completion. Well-planned group meetings held before and after remediation with full disclosure of plans and results can be an effective communication mechanism.

Maintenance personnel, general contractors, and handymen should be informed of the building owner/ management's intention to provide quick and effective response to indoor mold amplification. Personnel should understand the importance of early detection of moisture problems and the need for quick drying and cleaning after a flood or leak. Individuals who perform mold remediation should demonstrate sufficient knowledge of abatement strategies, cross-contamination and personal protective equipment appropriate for the designated job level.

8.0 TRAINING

The owners/management will provide training for the contents of this MMP and what is expected from personnel to implement the program. The personnel will be trained in the moisture and mold inspection procedure to be used during moisture incidents, complaints, and apartment turnovers. Skills developed from the training for turnover investigations will be useful for assessments of moisture intrusion, odors, or health complaints and the ongoing implementation of the MMPP.

Training Agenda for Management and participating personnel:

1. **What is a Moisture Minimization Plan (MMP)?**
    - Components of the program include: training, inspections, Level I Remediation, and documenting moisture-mold problems and remediation.
2. **What is mold?**
    - Molds in the environment, Building related molds, Health effects
3. **Why are complaints of building-related mold increasing?**
    - Changes in building construction;
    - Hidden molds: wall cavities, floor cavities, vents, air conditioners;
    - Increased medical and toxicological interest
4. **Prevention**
    - Knowledge: where does building mold occur and why;
    - Inspections: Routine, rental turnover, leaks, complaints;
    - Responding to leaks and water incidents quickly;
    - Flood restoration activities, Moisture, mold and building materials;
    - Relative humidity, Condensation, Temperature
    - Roofs, Crawl Spaces;
    - Plumbing, Building drains;
    - Grounds, Site drainage;
    - Air Conditioning, Sumps, Washers & Dryers, Vents (dryer, kitchen/bath);
    - Off-site sources: animal boarding, vermin, farms, vents, tanneries
5. **Intrusive investigations**
    - Personal Protective Equipment (PPE) and environmental containment
    - Field test for confirmation of mold;
    - Opening holes and looking inside;
    - Examining building materials, advanced use of moisture meters;
    - Is it dry? Should we get rid of it?;
    - Where did the water come from, where did it go, is the situation corrected?;
    - Where is the mold and how much is there?
6. **Flood and water restorations**
    - The need for prompt response and complete drying within 48-hours;
    - Drying methods including dehumidifiers and ventilation;

- Methods for drying carpeting, walls, insulation, framing, plaster, wood ;
- Determining when the services of a flood restoration contractor are required

7. **Mold abatements**
   - Classifying abatements: small, limited and full;
   - Personal Protective Equipment (PPE);
   - Environmental containment, Air ventilation and filtration;
   - Disinfecting porous and non-porous surfaces;
   - Furniture, clothing, books, drapes, rugs, etc.
   - Wallboard, carpeting, ceiling tiles;
   - Wall cavities, floor cavities
8. **Conclusion**
   - Implementing the MMP - Review of inspection frequency and procedure; Response to complaints; Evaluating moisture and mold damage; Determining when outside services (contractors) are required; Maintaining paperwork
9. **Discussion**

9.0 DESIGNATED PROGRAM MANAGER

The owners of the subject property shall designate a Program Manager (PM) who will oversee the implementation of the MMP at this property. The responsibilities of the PM are as follows, but are not limited to:

- Serves as the primary contact between the onsite manager and the property owner when addressing moisture issues at the property;
- Ensures tenant complaints/concerns involving moisture issues are addressed in a timely manner; within 48 hours of initial complaint;
- Oversees all moisture-related inspections (initial moisture complaints, follow-ups, routine building inspections and unit turnover);
- Ensures all staff conducting moisture-related inspections has received adequate training;
- Ensures all moisture incidents are properly documented, and such reports are properly filed for auditing purposes;
- Assesses/recommends the need to retain the services of a professional environmental consultant;
- Develops and/or evaluates an in-house remediation plan or evaluates a remediation plan submitted by an outside contractor.

10.0 CONCLUSIONS

The prompt remediation of contaminated material and infrastructure repair must be the primary response to moisture intrusion in buildings. The simplest and most expedient remediation that properly and safely removes mold growth from buildings should be used. Widespread contamination poses much larger problems that must be addressed on a case-by-case basis in consultation with a health and safety specialist. Effective communication with

building occupants is an essential component of all remedial efforts. Individuals with persistent health problems should go to the local occupational health clinic or see their physicians for a referral to practitioners who are trained in occupational/environmental medicine or related specialties and are knowledgeable about these types of exposures.

Upon discovery of indoor mold amplification, the following steps summarize the investigative process.

1. Roughly approximate the total surface area of visible mold. Categorization of the remediation levels are sometimes borderline, so when trying to decide the category to apply, consider the extent of visible growth, such as a heavy blanket of growth on the surface, to barely visible. If heavy growth is apparent, move up to the next level of protection.
2. ***Do not skip this step***. Address the source of water or moisture problem or the mold will simply reappear.
3. Always protect the health and safety of the building occupants and remediation workers.
4. Mold may be hiding on the backside of drywall, vinyl wallpaper, or paneling, the top of ceiling tiles, the underside of carpets and pads. Check walls behind furniture, pipe chases and utility tunnels, porous thermal or acoustic liners inside ductwork, or check the rafters (due to roof leaks or insufficient insulation).
5. Use your best judgment during investigations, if not disturbing the mold you may need minimal PPE. Do not alarm building occupants unnecessarily, but protect yourself as necessary. This typically entails use of gloves, splash goggles, and dust masks.
6. If the containment is working properly, the polyethylene sheeting will billow inwards on all surfaces. If it flutters or billows outward, containment has not been achieved, and you should find and correct the problem before starting your remediation activities. Confirm negative pressure with smoke tubes.
7. Select remediation personnel who have the experience and training needed to implement the remediation plan.
8. You must completely fix or eliminate the water or moisture problem to solve the problem.
9. You should revisit the site(s) approximately two weeks after remediation, and it should show no signs of water damage or mold growth. The cleanup should be discussed with the tenant and the manager or maintenance supervisor should inquire with the tenant if the remediation was satisfactory and if there has been any further indication of mold or moisture intrusion.
10. If you discover hidden mold, revise your plan by reassessing the size of mold impacted area.
11. If you believe that you have a hidden mold problem, you may want to consider hiring an experienced mold investigative professional.
12. Odors and health complaints that have not been resolved may require an investigation by a professional investigator and an evaluation by a physician that specializes in occupational, environmental or allergic medicine.

11.0 REFERENCES

1. U.S. Environmental Protection Agency. *Mold Remediation in Schools and Commercial Buildings*, EPA 402-K-01-001, March 2001
2. American Society of Heating, Refrigerating and Air-Conditioning Engineers, Inc. Ventilation for Acceptable Indoor Air Quality - ASHRAE Standard (ANSI/ASHRAE 62-2001). Atlanta, Georgia, 2001

3. New York City Department of Health: Guidelines on Assessment and Remediation of Fungi in Indoor Environments. New York: New York City Department of Health, Bureau of Environmental & Occupational Disease Epidemiology, (April 2000) January 2002
4. American Conference of Governmental Industrial Hygienists (ACGIH): *Bioaerosols: Assessment and Control*, edited by Janet Macher. Cincinnati, OH: ACGIH, 1999
5. U.S. Environmental Protection Agency *Should You Have the Air Ducts In Your Home Cleaned?* EPA-402-K-97-002. October 1997
6. Institute of Inspection, Cleaning and Restoration Certification (IICRC). *IICRC S500, Standard and Reference Guide for Professional Water Damage Restoration*, 2nd Edition. 1999
7. Occupational Safety & Health Administration. *Respiratory Protection Standard, 29 Code of Federal Regulations* 1910.134. 63 FR 1152. January 8, 1998
8. American Industrial Hygiene Association, *Report of Microbial Growth Task Force*, AIHA Press, Fairfax, VA, May 2001
9. US Army Center for Health Promotion and Prevention Medicine (USACHPPM), *Army Facilities Management Information Document on Mold Remediation Issues*, Feb. 2002

12.0 NAME THIS SOMETHING

12.1 Designated Program Manager

The owner(s) of the subject property at, Site Name have designated a Program Manager (PM) who will oversee the implementation of the MMP at this property. The responsibilities of the PM are as follows, but are not limited to:

- Serves as the primary contact between the onsite manager and the property owner when addressing moisture issues at the property,
- Ensures tenant complaints/concerns involving moisture issues are addressed in a timely manner; within 48 hours of initial complaint,
- Oversees all moisture-related inspections (initial moisture complaints, follow-ups, routine building inspections and unit turnover),
- Ensures all staff conducting moisture-related inspections has received adequate training,
- Ensures all moisture incidents are properly documented, and such reports are properly filed for auditing purposes,
- Assesses/recommends the need to retain the services of a professional environmental consultant,
- Develops and/or evaluates an in-house remediation plan or evaluates a remediation plan submitted by an outside contractor,

Property Name

Site Name

Property Address

Site Street Address
Site City, Site State Site Zip Code

Designated Program Manager

Name: _____

Relationship: _____

Phone: _____

Core Elements and Relevant Tools Summary

CORE ELEMENT	DESCRIPTION	RELEVANT TOOL(S)
ANNUAL PLAN REQUIREMENTS		
Tenant Information	Provide information to all tenants at the time of lease signing or renewal, or once a year, whichever is most frequent. The information should provide residents with facts about mold and tips to minimize moisture and mold growth.	☐ Resident Tip Sheet ☐ Resident Information Checklist
Tenant Information	Include language regarding tenant acknowledgement of mold hazards and his/her obligations to mitigate such hazards in every tenant lease.	☐ Lease Provision or Lease Addendum Tips
Inspections	Inspections for water intrusion and mold must be routine, comprehensive, verifiable, and include: all inhabited spaces (especially any areas with past mold and/or moisture issues), HVAC systems (and associated spaces), and exterior building skin materials (to include roofing, siding, windows and doors).	☐ Inspection Schedule ☐ All Inspection Checklists
ONGOING PLAN REQUIREMENTS		
Documentation	The plan must be written and verifiable at the subject property. Record every inspection, each observed or reported incident relating to water intrusion and/or mold, and all responses. Keep all records on site.	☐ The Written Plan ☐ All Tools
Training	Provide information regarding the risks associated with mold and the procedures to properly respond to inspection, repair, remediation, and documentation requirements to maintenance workers and on site management.	☐ Annual Employee Training Checklist ☐ Resources for Training ☐ Sources for Industry Information ☐ EPA Tables 1 and 2 ☐ Resident Tip Sheet
INCIDENT RESPONSE/REMEDIATION REQUIREMENTS		
Incident Response	Respond to all water intrusion events in a timely manner per EPA recommendations. Record all findings and actions	☐ EPA Table 1 ☐ Materials and Equipment List ☐ Contact List

CORE ELEMENT	DESCRIPTION	RELEVANT TOOL(S)
Tenant Information	Provide tenants written notification of findings and actions taken	☐ Initial Resident Letter ☐ Follow-up Letter
Inspection	Re-inspect areas affected by water intrusion to determine if mold develops. Re-inspect areas where mold remediation has been conducted to determine if mold re -emerges. If water intrusion and/or mold is caused by a rain event, reinspect completed work after the next rain.	☐ All Inspection Checklists
Remediation	Correct all mold issues per EPA guidance.	☐ EPA Table 2 ☐ Materials and Equipment List ☐ Contact List
Documentation	Record all findings and actions.	☐ Incident Tracking Log ☐ Event Checklist

Freddie Mac Moisture Management Plan Handbook

12.2 Sources for Industry Information

U.S. Environmental Protection Agency - Indoor Air Quality

- General information: http://www.epa.gov/iaq/ or the Indoor Air Quality Information Clearinghouse, at 800.438.4318
- Mold-specific information: http://www.epa.gov/iaq/molds/index.html
- EPA's guidance, *Mold Remediation in Schools and Commercial Buildings*, can be found at http://www.epa.gov/iaq/molds/images/moldremediation.pdf.
- The document *Building Air Quality: A Guide for Building Owners and Facility Managers*, at http://www.epa.gov/iaq/largebldgs/baqtoc.html, has an appendix (Appendix C) which specifically deals with moisture and mold concerns.
- The mold resources page, http://www.epa.gov/iaq/molds/moldresources.html, contains many useful links and is a good starting point for anyone wanting to learn more about mold.

U.S. Department of Labor, Occupational Safety and Health Administration

- Mold-specific information: http://www.osha.gov/SLTC/molds/. Provides information about applicable standards (OSHA and ANSI) as well as general mold information and testing methods.
    - Also provides a link to *Fungal Contamination in Public Buildings: A Guide to Recognition and Management*, from the Federal-Provincial Committee on Environmental and Occupational Health, Environmental Health Directorate, Health Canada: https://publications.gc.ca/site/eng/9.674163/publication.html. While some of the information is specific to Canada's regulations, this document provides a thorough review of mold information and treatment.
- New York City Department of Health & Mental Hygiene
    - New York City has issued a comprehensive review and guidance on mold issues, the *Guidelines on Assessment and Remediation of Fungi in Indoor Environments*, which can be found at https://www.nyc.gov/assets/doh/downloads/pdf/epi/epi-mold-guidelines.pdf or by calling (212) 788-4290.
- General information: www.aiha.org or (703) 849-8888
    - *The Facts About Mold: A Consumer Focus* available at https://aiha-assets.sfo2.digitaloceanspaces.com/AIHA/resources/Facts-About-Mold-A-Consumer-Focus-Fact-Sheet.pdf.
    - Mold information and links available at https://healthierworkplaces.org/consumer-health-safety-disaster-preparedness-mold-resources/mold-safety-resources-consumers.
    - General information: https://www.ashrae.org/ or (800) 527-4723.

American Industrial Hygiene Association
American Society of Heating, Refrigerating, and Air-Conditioning Engineers, Inc.

- ASHRAE has compiled a book, *Mold and Moisture Management in Buildings*, available for purchase online at https://www.techstreet.com/ashrae/standards/mold-and-moisture-management-in-buildings?gateway_code=ashrae&product_id=1717665.

National Multi Housing Council

- General information: http://www.nmhc.org or (202) 974-2300
- Mold and mildew page: http://www.nmhc.org/Content/BrowseIssues.cfm?IssueID=78
- NMHC offers a guidance, *Operations and Maintenance Plan for Mold and Moisture Control in Apartment Properties*, available for members only.
    - Some of the website's links are for members only
- National Apartment Association
    - General information: https://www.naahq.org/ or (703) 518-6141
    - Provides a link to the NAA Mold Action Kit: A Best Practice for Owners and Managers: https://www.naahq.org/sites/default/files/2022-05/16a.%20Mold%20Action%20Kit.pdf.
    - Most links are for members only.

- Household Mold Resource Center at http://www.moldtips.com/ (primarily geared toward single-family homeowners).

12.3 Resources for Training

Management is responsible for ensuring that on-site maintenance and management staff have the knowledge and tools necessary to deal with mold and moisture problems. Although some training sources are identified below, these are not represented to be comprehensive or fully adequate; management must determine what level of information is necessary to provide workers with sufficient knowledge. All training must be documented.

Background Reading For the majority of staff training, the most cost-effective training method is having staff read applicable guidance documents, such as the following:

- EPA's guidance, *Mold Remediation in Schools and Commercial Buildings*, which can be found at https://www.epa.gov/sites/default/files/2014-08/documents/moldremediation.pdf or by calling the Indoor Air Quality Information Clearinghouse at (800) 438-4318.
- The New York City Department of Health & Mental Hygiene's *Guidelines on Assessment and Remediation of Fungi in Indoor Environments*, which can be found at https://www.nyc.gov/assets/doh/downloads/pdf/epi/epi-mold-guidelines.pdf or by calling (212) 788-4290.

See also the "Sources for Industry Information" tool for further reading resources.

Training Videos For a moderate initial cost, staff can also view training videos such as the Defeating the Mold Monster, from the National Apartment Association and the National Multi Housing Council. This one hour video can be ordered online at https://store.gowithvisto.org/products/defeating-the-mold-monster.

Intensive Training Courses

If formal training courses are desired, there are many potential options available online. For example, the Indoor Air Quality Association offers a 2-day mold remediation worker course at https://iaqa.org/education/training-courses/acac-certified-microbial-investigator-training/#top, and a Certified Mold Remediator course http://www.iaqa.org/cmr_info.htm, though these are more expensive options and probably go beyond the level of training needed for maintenance staff. Training courses vary greatly in cost, location, and length.

Annual Employee Training Checklist

Employee training must be documented. In the form below, dates are to be indicated as each employee completes training. Records for each year must be kept on file.

EMPLOYEE NAME	REVIEWED RESIDENT TIP SHEET (DATE)	RECEIVED TRAINING ON VISUAL AND OLFACTORY MOISTURE AND MOLD INSPECTIONS (DATE)	RECEIVED TRAINING ON EPA GUIDANCE FOR WATER CLEANUP AND MOLD REMEDIATION (DATE)	RECEIVED OTHER TRAINING: SPECIFY (DATE)

Resident Tip Sheet

Mold Facts and Tips Residents must be informed about the risks associated with mold and actions they can take to mitigate these risks.

Facts about Mold

What are molds? Molds are simple, microscopic organisms, present virtually everywhere, indoors and outdoors. Molds, along with mushrooms and yeasts, are *fungi* and are needed to break down dead material and recycle nutrients in the environment. For molds to grow and reproduce, they need only a food source – any organic material, such as leaves, wood, paper, or dirt— and moisture. Because molds grow by digesting the organic material, they gradually destroy whatever they grow on. Sometimes, new molds grow on old mold colonies. Mold growth on surfaces can often be seen in the form of discoloration, frequently green, gray, brown, or black but also white and other colors. Molds release countless tiny, lightweight spores, which travel through the air.

Can mold become a problem in my home? Molds will grow and multiply whenever conditions are right— sufficient moisture is available and organic material is present. The presence of organic material cannot be prevented, because such materials are the materials with which your home is made. However, the moisture that mold needs to grow, and the accumulation of that moisture can be controlled. Be on the lookout in your home for common sources of indoor moisture that may lead to mold problems (see the following section for prevention tips).

Should I be concerned about mold in my home? Yes. If indoor mold contamination is extensive, it can release chemicals and cause very high and persistent airborne spore exposures. Persons exposed to high levels of chemicals or spore levels can become sensitized and develop allergies to the mold or other health problems. Mold growth can damage your furnishings, such as carpets, sofas, and cabinets. Clothes and shoes in damp closets can become soiled. In time, unchecked mold growth can cause serious damage to the structural elements in your home. Mold can also produce health effects through inflammation, allergy, or infection. Allergic reactions are common following mold exposure. Typical symptoms that mold-exposed persons report (alone or in combination) include:

- Respiratory problems, such as wheezing, difficulty breathing, and shortness of breath
- Nasal and sinus congestion
- Eye irritation (burning, watery, or reddened eyes)
- Dry, hacking cough
- Nose or throat irritation
- Skin rashes or irritation

Headaches, memory problems, mood swings, nosebleeds, body aches and pains, and fevers are occasionally reported in mold cases, but their cause is not understood.

Tips for Residents

It is our goal to maintain the highest quality living environment for our residents. To help achieve this goal, it is important to work together to minimize the potential for conditions that could lead to the growth of naturally occurring mold. Residents can help minimize mold growth in their apartment homes by taking the following actions:

Ventilation

- Adequate ventilation is essential – open windows during dry weather. If it is not possible to open windows, run the fan on the apartment air-handling unit to circulate fresh air throughout your apartment.
- In damp or rainy weather conditions, keep windows and doors closed.
- If possible, maintain a temperature of between 50° and 80° Fahrenheit within your apartment at all times, and a comfortably low humidity (less than 60% relative humidity).
- Use the pre-installed bathroom fan or alternative ventilation when bathing or showering and allow the fan to run until all excess moisture has vented from the bathroom.
- Use the exhaust fans in your kitchen when cooking or while the dishwasher is running and allow the fan to run until all excess moisture has vented from the kitchen.
- Ensure that your clothes dryer vent is operating properly, and clean the lint screen after every use.

- When washing clothes in warm or hot water, watch to make sure condensation does not build up within the washer and dryer closet; if condensation does accumulate, dry with a fan or towel.

Cleaning and Maintenance

- Clean and dust your apartment on a regular basis as required by your lease. Regular vacuuming, mopping, and use of environmentally safe household cleaners is important to remove household dirt and debris that contribute to mold growth.
- Periodically clean and dry the walls and floors around the sink, bathtub, shower, toilets, windows and patio doors using a common household disinfecting cleaner.
- On a regular basis, wipe down and dry areas where moisture sometimes accumulates, like countertops, windows and windowsills.
- Use care when watering houseplants. If spills occur, dry excess water immediately.
- Thoroughly dry any spills or pet urine on carpeting.
- Do not overfill closets or storage areas. Ventilation is important in these spaces.
- Do not allow damp or moist stacks of clothes or other cloth materials to lie in piles for an extended period of time.

Reporting Problems

- Immediately report to the management office any evidence of a water leak or excessive moisture in your apartment, storage room, garage, or any common area.
- Immediately report to the management office any failure or malfunction with your heating, ventilation, air-conditioning system, or laundry system. As your lease provides, do not block or cover any of the heating, ventilation or air-conditioning ducts in your apartment.
- Immediately report to the management office any inoperable windows or doors.
- Immediately report to the management office any musty odors that you notice in your apartment.

Lease Provision or Addendum Tips

Tenants must be informed of the risks associated with mold and their obligations to reduce these risks. Following are points to be addressed in the lease itself or in an addendum.

Tenant responsibility/acknowledgement:

- Acknowledgement by the tenant of his/her obligation to take measures to prevent moisture accumulation and mold growth, including appropriate climate control, regular cleaning, removal of visible moisture accumulations, and clearing all vents and ducts from obstructions.
- Acknowledgement by the resident that he/she has received the information regarding mold and actions to mitigate its risk.

- Tenant's agreement to promptly report leaks, moisture or visible evidence of mold growth in his/her unit, malfunction of HVAC or laundry equipment in the unit, plumbing leaks, any water accumulation due to leaks.

Initial Resident Letter

Residents must be kept informed as observations are made and as actions are taken.

Site Name Client Contact Address Phone Number

Date:

To: Resident(s) Name Building / Unit # _____

From: Client Contact

Re: Moisture and Mold Inspection Results

Dear Resident(s),

It has been (insert appropriate time) days since we inspected (and/or treated) your apartment. We hope that all of your concerns have been addressed (and/or remedied) to your satisfaction.

Please refer to the attached information, which contains information about mold and useful tips for preventing mold growth in your apartment home.

If you notice any evidence of moisture intrusion or mold growth in your apartment, please immediately notify the management office.

Sincerely,

Property Manager
Attachment (Resident Tip Sheet)

Portions used with the permission of the National Multi-Housing Council, Inc.

Follow-Up Resident Letter

Residents must be kept informed as observations are made and as actions are taken.

Site Name Property Manager or Contact Person Address Phone Number

Date:

To: Resident(s) Name Building / Unit # _____

From: Client Contact

Re: Moisture and Mold Follow-Up

Dear Resident(s),

Following our initial remediation on (insert date) of moisture (and/or mold) in your apartment, we have reinspected to ensure that the problem has been solved. As of (insert date of re-inspection), no evidence of moisture or mold was found in your apartment. We hope that all of your concerns have been addressed to your satisfaction.

Thank you for your cooperation with this issue. If this problem recurs, or if you notice any other evidence of moisture intrusion or mold growth in your apartment, please immediately notify the management office.

Sincerely,

Property Manager

Portions used with the permission of the National Multi-Housing Council, Inc.

12.4 Resident Information Checklist

Information provided to tenants must be documented. The property manager should place the date or "NA" in each box for each unit. All relevant documents associated with the checklist, such as copies of the resident tip sheet, signed leases, formalized inspection schedules, and incident tracking logs should also be filed and stored.

Site Name **and Building Address**: _____

UNIT	PROVIDE TIP SHEET TO RESIDENTS (DATE)	CURRENT LEASE WITH MOLD PROVISIONS (DATE)	INITIAL CORRESPONDENCE REGARDING EVENT (DATE)	FOLLOW-UP CORRESPONDENCE REGARDING EVENT RESOLUTION (DATE)

12.5 Inspection Schedule

Inspections must be regularly scheduled.

UNIT	PROPOSED DATE OF INSPECTION	APPROVAL OF DATE BY TENANT	ACTUAL DATE OF INSPECTION	NAME OF INSPECTOR

12.6 Funky table

12.7 Exterior / HVAC Inspection

Checklist – Building _____, Observation Date _____

(Portions used with the permission of the National Multi-Housing Council, Inc.)
All of the areas noted on the checklist must be routinely checked by trained staff. Once the building has been inspected, the property manager must keep this documentation on file at the subject property.

ITEM	IDENTIFY ISSUE	DATE CORRECTED
BUILDING EXTERIOR		
Check foundation		
Check gutters / down spouts		
Check stairs		
Check landscaping at building perimeter		
Check exterior utility closet		
Check irrigation system		
Check roof		
Check caulk around windows and doors and connecting corner trim		
Check mortar and bricks for damage		
HVAC		
Check operation		
Check air circulation		
Check thermostat		
Check evaporator coil		
Check condensate pan		
Check condenser coil		
Check condenser fan motor		

ITEM	IDENTIFY ISSUE	DATE CORRECTED
Check furnace		
Check baseboard heaters		
Check all vents		
Change filters		
PATIO / BALCONY		
Check roof		
Check exterior doors		
Check deck surface		
Check storage closet		
Check exterior paint		

12.8 EPA Table 1

All water intrusion and associated damage must be addressed per EPA guidance. The Table below may change from time to time and the current resource should be sought from the EPA.

Water Damage – Cleanup and Mold Prevent

GUIDELINES FOR RESPONSE TO CLEAN WATER DAMAGE WITHIN 24-48 HOURS TO PREVENT MOLD GROWTH	
Water-Damaged Materials	**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. ☐ Accelerated 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.
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.

A. 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 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.

B. If a particular item has high monetary or sentimental value, you may wish to consult a restoration/water damage specialist.

C. 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.

U.S. EPA, Mold Remediation in Schools and Commercial Buildings, March 2001 (updated June 2001).

12.9 EPA Table 2

All mold remediation must be conducted per EPA guidance. The Table below may change from time to time and the current resource should be sought from the EPA.

Guidelines for Remediating Building Materials with Mold Growth Caused by Clean Water (A)

MATERIAL OR FURNISHING AFFECTED	CLEANUP METHODS (B)	PERSONAL PROTECTIVE EQUIPMENT	CONTAINMENT
SMALL - TOTAL SURFACE AREA AFFECTED LESS THAN 10 SQUARE FEET			
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		

MATERIAL OR FURNISHING AFFECTED	CLEANUP METHODS (B)	PERSONAL PROTECTIVE EQUIPMENT	CONTAINMENT
MEDUIM - TOTAL SURFACE AREA AFFECTED BETWEEN 10 AND 100 (FT^2)			
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		
LAREGE - 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		

MATERIAL OR FURNISHING AFFECTED	CLEANUP METHODS (B)	PERSONAL PROTECTIVE EQUIPMENT	CONTAINMENT
Upholstered furniture & drapes	1, 3, 4		
Wallboard (Drywall and gypsum board)	3, 4		
Wood surfaces	1, 2, 3, 4		

A. Use professional judgment to determine prudent levels of Personal Protective Equipment and containment for each situation, particularly as the remediation site size increases and 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 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.

B. 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 a 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.

U.S. EPA, Mold Remediation in Schools and Commercial Buildings, March 2001 (updated June 2001).

12.10 Incident Tracking Log

All issues, repairs, and remediation actions must be tracked and recorded.

BUILDING / UNIT #	CHRONOLOGY	DATE / TIME	REPORTED BY / ACTION TAKEN BY	DESCRIPTION OF ISSUES AND ACTIONS
	Initial Situation Identified			
	Actions Taken			
	Initial Tenant Correspondence			
	Follow-Up Inspection			
	Follow-Up Tenant Correspondence			

BUILDING / UNIT #	CHRONOLOGY	DATE / TIME	REPORTED BY / ACTION TAKEN BY	DESCRIPTION OF ISSUES AND ACTIONS
	Initial Situation			
	Actions Taken			
	Initial Tenant Correspondence			
	Follow-Up Inspection			
	Follow-Up Tenant Correspondence			

12.11 Event Checklist

Event Checklist

All observations and actions taken must be recorded and kept on site. Attach additional information to this document as appropriate. This document may need to be revisited over the span of several weeks to ensure that all requirements have been fulfilled.

Building Name: _____

Unit Number: _____

Date Notified: _____

Description of event:

_____

_____

_____

Steps taken to alleviate problem:

_____

_____

_____

Indicate with N/A or checkmark

Event Checklist All observations and actions taken must be recorded and kept on site. Attach additional information to this document as appropriate. This document may need to be revisited over the span of several weeks to ensure that all requirements have been fulfilled.
Building Name: _____
Unit Number: _____
Date Notified: _____
Description of event: _____
_____
_____
Steps taken to alleviate problem: _____
_____
_____
Indicate with N/A or checkmark
☐ Responded to problem within 24 hours. (Date: _____)
☐ Documented event with Event Checklist and Incident Tracking Log. Document steps taken to alleviate the problem. Initial Resident Letter sent. (Date: _____)
☐ Follow-up inspection seven days after the event. Follow-up Resident Letter sent. (Date: _____)
☐ Re-inspect after next significant rainfall to ensure problem has been solved (if applicable). (Date: _____)
☐ Schedule an annual inspection for this unit. (Date: _____)

Materials and Equipment List

Maintenance staff and management must be prepared to deal with water intrusion and mold events as they occur. The following equipment is available at most supply stores. The MMP must document what materials are kept readily available and how this inventory is maintained.

1. Wet vacuum
2. High efficiency particulate air (HEPA) filtered vacuum cleaner
3. Blowers or fans (have on site or know where to rent)
4. Dehumidifiers (have on site or know where to rent)
5. Disinfectant or bleach and standard cleaning detergents
6. Disposable scrub brush, sponges, and cloths
7. Plastic spray cleaning bottles
8. Localized containment bag (2-glove bags)

9. Disposable clothing (1 box)
10. N-95 disposable respirators (5 pack)
11. 6-mil disposable bags (1 box)
12. 6-mil polyethylene sheeting (2 rolls)
13. Yellow caution tape (3 rolls)
14. Moisture meter (optional) See the Contact List for information on where to buy or rent materials.

12.12 Contact List

Maintenance staff and management must be prepared to deal with water intrusion and mold events as they occur. The MMP must include up-to-date information on resources that are not readily available on site.

Contact at Servicer

For questions about implementing the Moisture Management Plan, and for notification of mold contamination that cannot be addressed by in-house maintenance staff:
Name: _____
Phone: _____
Address: _____

Mold Remediation Assistance
Contractors to respond to mold contamination that cannot be addressed by in-house maintenance staff:
Company: _____
Contact Name: _____
Phone: _____

Company: _____
Contact Name: _____
Phone: _____

Rental Equipment
Access to special equipment not kept on site, such as blowers and dehumidifiers:
Company: _____
Phone: _____
Equipment Available: _____

Company:_____

Phone: _____ Equipment Available: _____

Equipment Purchasing

Companies used for purchasing special supplies such as disposable clothing, respirators, cleaning supplies, and plastic sheeting:
Company: _____
Phone: _____
Equipment Available: _____

Company: _____

Phone: _____

Equipment Available: _____