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Essential Information for Key Business Decisions

TOXIC MOLD OVERVIEW

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- **In California, a jury ordered Allstate Insurance to pay a policyholder \$18.5 million for acting in bad faith in a coverage dispute over mold in the plaintiff's home.** *Anderson v. Allstate Ins. Co.*
- **A North Carolina motel owner recovered \$6.7 million from contractors after construction defects led to mold infestation.** *Lawyers Weekly February 5, 2001*
- **Two class action suits have been filed against the owners of several apartment buildings in San Francisco alleging injuries and damages arising from exposure to toxic mold.** *San Francisco Gate February 2, 2001*
- **An employee of a community college in New York has filed suit seeking \$65 million for injuries and damages arising from exposure to toxic mold.** *Mealey's Litigation Report Mold February 2001*
- **"Toxic Mold...The Next Asbestos"** *headline from Lawyers Weekly October 2, 2000*

News stories like these are becoming more common each week as America appears to be under siege by toxic mold.

What Are Molds?

Fungi, including mushrooms, molds, mildews, and smuts, are a group of plants that obtain nutrients from organic matter. This may be accomplished by parasitizing living organisms or utilizing nutrients absorbed in liquid form from dead/decaying plant or animal matter. The organic substances used as nutrient sources by fungi are quite diverse and include materials such as fruits, vegetables, wood, and jet fuel.

In the competitive world of microorganisms, certain species of fungi prosper by adapting to environmental niches not well developed by other organisms. In the past, this has included infestations of the plants eaten by wild and domestic animals as well as the crops cultivated, stored, and consumed directly by man. The closeness of the relationship between humankind and fungi has led to notable outbreaks of illness throughout history.

What Are Molds? (Continued)

- At one time, many of the commoners living in central Europe ate rye bread two or three times each day. In 857 AD, there was a very large outbreak of illness characterized by tingling, fever, cold extremities, stomach pain, hallucinations, gangrene, and convulsions. The illness was caused by consuming bread made with rye contaminated with a type of fungus known as ergot.
- The unusual behaviors that led to the Salem witch trials have been attributed to hallucinations caused by eating grain contaminated with high concentrations of fungal toxin produced during a particularly wet year.
- In a 1921 English study entitled *The Health of the Industrial Worker*, researchers Collis and Greenwood identified the probable cause of an asthma or spasmodic cough affecting cotton weavers and others in the industry as the inhalation of the spores of *Aspergillus* which formed from time to time on the cotton thread.
- The 1922 edition of *Veterinary Bacteriology* by Buchanan noted that several investigators had claimed the production of “powerful toxic substances of some kind (possibly true toxins)” by *Aspergillus fumigatus* grown in artificial media.
- A New York State Industrial Bulletin published in 1939 noted that dusts bearing the mycelia and spores of parasitic fungi were known to cause “annoyance and discomfort”.

In today's urban settings, certain fungi have adapted to environments associated with construction materials, heating and air conditioning systems, furnishings, and floor coverings in the buildings in which we live and work. Dirt within these buildings is also a source of nutrients for fungi.

Modern construction techniques employed in the United States, and elsewhere, call for the frequent use of wallboard materials that include plywood and wood pulp as well as gypsum board (a prefabricated form of traditional wet plaster that is cast between paper facings). Although gypsum board is >80% calcium sulfate dihydrate (the gypsum mineral plus water) by weight, it also contains materials that can be utilized by some molds as nutrients, i.e.

- Recycled paper (cellulose) which may account for as much as 15% of gypsum board by weight.
- Starch (as much as 3% of gypsum board by weight)
- Paraffin wax for water-resistant sheeting, exterior, and shaftwall liner gypsum panels (as much as 2% of gypsum board by weight).

It should be noted that regardless of the specific environment in which they become established, the general structure of mold remains the same. A young mold consists of long, highly branched thread-like linear groups of cells (hyphae) that intertwine to form the fungus body (mycelium). These “threads” can penetrate many of the materials upon which they grow, including drywall, wallboard, wallpaper, insulation, and ceiling tiles (all of which contain organic material that are sources of nutrients). As the mold matures, it produces spores. The spores are very light and will float in the air until they settle on some surface where they will remain until they begin to grow or the air is disturbed.

What Are Molds? (Continued)

In addition to nutrients, molds generally require only an appropriate temperature (between approximately 40 and 100 degrees F), and adequate moisture for growth. So when a spore comes into contact with material having sufficient warmth, moisture, and nutrients, it will germinate.

It should be kept in mind that molds do not require saturated conditions to grow...although ignored water damage or similar environments may support mold growth, growth can also occur when high relative humidity and/or the ability of building surfaces to absorb and retain moisture create similar conditions.

For example:

- The living activities of a family of four can add more than 18 gallons of water a week to the air in their home. More water vapor in the air means a high indoor relative humidity. Relative humidity is the amount of water vapor in the air stated as a percentage of the maximum amount of water vapor that could be held in the same air at the same temperature (saturated air has a relative humidity of 100%, while air containing half of the water vapor it is capable of holding at the same temperature has a relative humidity of 50%). The ability of air to hold water vapor decreases as the temperature of the air decreases. Damp spots on ceilings and room side surfaces of exterior walls may result from excessive indoor humidity. This humidity can pass through walls and freeze in the insulation. Moisture is able to pass through walls because of vapor pressure...a flow independent of air currents. In spring, the frozen material returns to the liquid state and sufficient moisture may be present to support mold growth. In winter, inside air may be much more humid than colder outside air so the vapor pressure actually forces the inside moisture through cement, wood, and brick toward the outside. Further, certain varnishes and paints block the flow of moisture and condensation can occur between the inside and outside walls, or under exterior paint surfaces. Condensation is more apt to occur in climates where the average January temperature is 35 degrees F or colder.
- Many homes with forced air central heating system are equipped with drum humidifiers (which look like foam-covered paddle wheels rotating through a tray of water). Unless frequently cleaned, these devices often become encrusted with debris and conditions develop favorable for the growth of fungi (and bacteria).
- Dirty drip pans, unvented or poorly vented bathrooms-laundry rooms-kitchens-attics-closets and basements may harbor molds.
- In a 1997, study performed on a building occupied by federal offices, it was determined that some microbial growth was caused by a water leak. However, mold was found to have grown in other parts of the building as a result of water and moisture migration into the building through pre-cast concrete panels as well as interactions between airflow and imbalances in the building ventilation system.

What Are Molds? (Continued)

- A study performed in Kansas City, Missouri included the testing of 45 homes from all parts of the metropolitan area. These homes represented a wide range of socioeconomic backgrounds. More than 50% of the homes tested yielded at least one air sample with a significant mold count (over 10,000 spores/cubic meter). The fungi *Aspergillus* and/ or *Penicillium* were predominant in many samples, while the *Stachybotrys* (from both air and bulk samples) was discovered in 11 (24%) of the homes. Relative humidity readings were elevated (>50%) 40% of the time, and approximately 20% of homes exhibited carbon dioxide levels over 1000 ppm (parts per million)...apparently indicating a lack of quality air exchange (it is generally accepted that afternoon carbon dioxide concentrations >1,000 ppm indicate an unacceptable supply of outside air).

Fungi may impact human health in a number of ways:

- Allergy (likely the most common). Most fungi produce antigenic proteins that can trigger allergic reactions.
- Fungi growth on/in the body. Fungi may infect man (as well as plants and other animals) causing a host of diseases, some of which are seriously debilitating or fatal.
- Microbial volatile organic compounds (MVOCs) produced by some fungi during the degradation of substrates can be irritating to mucous membranes, cause headaches, and other symptoms. For individuals with chemical sensitivity, MVOCs can trigger a reaction as strong as exposure to "chemical" VOCs.
- Reaction to the presence of mycotoxins (i.e. toxic substances produced by fungi, particularly mold).

It appears that mycotoxins, particularly those associated with *Stachybotrys*, have been identified as the agents of harm in many "toxic mold" cases.

Mycotoxins are metabolites (chemicals that are formed by fungi either when breaking down complex materials into simpler ones, or building new, more complex molecules). This later process, called biosyntheses, is a sequence of enzyme-catalyzed reactions by which relatively complex molecules are formed in living cells from nutrients with relatively simple structures.

Trichothecenes, mycotoxins that may be produced by *Stachybotrys*, are frequently identified in "toxic mold" cases. Trichothecenes are also produced by fungi that grow on food crops as well as with those that colonize moisture compromised building materials such as wallboard.

Trichothecenes (tetracyclic sesquiterpenes) are so good at destroying cellular material that they are used as chemical warfare agents. Mild exposure to the concentrated forms used in warfare produce vomiting and bleeding while exposure to high concentrations may result in death as there are no antidotes to these heat and ultraviolet light stable compounds. Trichothecenes may enter the body by way of the skin, inhalation, or ingestion.

What Are Molds? (Continued)

Despite the virulence of mycotoxins, their identification as the sole or even primary causative agent of illness in “toxic mold” cases may often be incorrect, or at least premature for a number of reasons.

- Mold may grow well under a given set of conditions, but not necessarily produce mycotoxin(s).
- As of late 2000, the California Department of Health Services reported that “there are no commercial laboratory tests currently available that can detect mycotoxins in a building where molds are present.”
- Mycotoxins are common in soil and dust, including that found throughout urban areas...both indoors and out. At least one USEPA-funded study identified house dust as a repository for environmental pollutants that may accumulate indoors from both internal and external sources. Dust and tracked-in soil accumulate readily in carpets, and the pollutants associated with dust and soil may present an exposure risk to infants and toddlers, who spend significant portions of their time in contact with or in close proximity to the floor and who engage in frequent mouthing activities.
- Many of the symptoms identified in “toxic mold” cases are nonspecific and could be related to exposure to other sources or infectious agents.
- Simple moisture and dust mite feces are linked to the same indoor air quality problems associated with molds. Dust mites are prolific in areas of high humidity.
- Increase in childhood lung diseases and diseases of adults with compromised immune systems are increasing. This increase has been attributed by reputable investigators to a combination of biological and environmental factors identified as co-exposure to a complex of environmental contaminants including tobacco smoke, automobile exhaust, respirable particulate matter, irritant gases, etc. With regard to asthma alone, the number of American children under 15 years of age suffering from this condition reportedly increased 41% between 1970 and circa 1976.

In summary, it can be said that historical experience and contemporary data support the position that a number of interrelated factors may contribute to “toxic mold” events even when visible mold growth and/or mycotoxins have been identified in a structure. Therefore, premature identification of mold as the causative agent of illness with resultant attention to visible mold removal at the expense of further investigation may prove to be a significant and costly disservice to all parties concerned.

Is The Threat Real?

There are a rapidly growing number of mold related claims that have been filed across the nation. Plaintiffs are seeking recovery from building owners, architects, property managers, general contractors and subcontractors, suppliers of construction components, condo owners associations, plumbers, and heating ventilation and air conditioning (HVAC) contractors.

There is ongoing litigation involving allegations of damage caused by mold. Claims have been or are being litigated in several states including California, Delaware, Florida, New York, and Ohio.

According to information published by GeneralCologne Re, several toxic mold awards and/or settlements have exceeded \$500,000 in damages.

Insurance Issues

Toxic mold claims may affect insurance carriers that provide Homeowners', Umbrella, General Liability, Workers' Compensation, Employers' Liability, Commercial Package, and Difference in Conditions policies.

Many of the claims that insurers are seeing or will see are complex involving multiple claimants, class action lawsuits, and multiple defendants. There are first and third party components to many of these actions. Property damage claims may include:

- Exterior Building Damage
- Interior Damage
- Structural Damage
- Destruction of Contents
- Loss of Use

Bodily Injury claims may allege:

- Respiratory Problems
- Skin Rashes
- Headaches
- Lung Damage
- Auto-Immune Response
- Brain Damage
- Death

The coverage and allocation issues have yet to be conclusively decided by the courts but the similarities to environmental and asbestos cases are apparent.

Is The Threat Real? (Continued)

Coverage issues to be considered when evaluating the merits of a mold claim are:

- Number of Occurrences
- Trigger of Coverage
 - Injury in Fact
 - Manifestation
 - Date of Exposure
 - Continuous
- Bodily Injury
 - Limited to Physical Injury – No Emotional Injuries
- Property Damage
 - Physical Injury to Tangible Property
- Pollution Exclusion
 - Indoor Pollutants
 - Naturally Occurring
- Personal Injury – Eviction
 - Pollution Exclusion May Not Apply

Investigation and Valuation of Mold Claims

MMI has developed a multi-disciplined staff including environmental scientists, forensic accountants and insurance professionals. We utilize a three-step approach to evaluating the merits of a claim.

1. Historical Investigation
 - Develop factual information related to the building site history
 - Design, construction, alteration, maintenance
 - Analysis of the medical history of the claimant(s)
2. Technical Investigation
 - Investigation to identify mold receptors and carriers
 - Analysis of technical reports provided by claimant's experts
3. Financial Investigation
 - Analysis of remediation methods
 - Analysis of medical expenses
 - Analysis of cost estimates