



Complete Home Evaluation Services LLC  
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### **Mold Analysis**

Date: April 12, 2010

Customer:

Address of Property:

Email:

### **Surface Sampling**

Complete Home Evaluation Services either a surface swab or tape for this procedure. Surface samples were taken in the following areas: none taken

### **Air Testing**

Complete Home Evaluation Services uses the BIO-PUMP Plus air sampler pump with Allergenco D Disposable Air Monitoring Cassettes. The BIO-PUMP is operated for a period of five minutes with the Allergenco cassette trapping air borne mold spores. The volume of air tested is 75 liters.

Air samples were taken in the following areas:

- Cellar
- Outside

### **Interpreting Laboratory Results**

The American Conference of Government Industrial Hygienists (ACGHI) suggests an average of 50 to 500 spores per cubic meter (Ct./m<sup>3</sup>) or a ratio of inside to outside spore count of 10 to 33 percent.

Surface samples have a numerical rating scale. 1 is the lowest recorded level (Trace) while 5 is the highest (Heavy or Highly Abundant Presence). N.D. means Not Detected.

## Lab Results

Cellar:

Ascospores- 110 Ct./m<sup>3</sup>

Aspergillus/Penicillium- 2,300 Ct./m<sup>3</sup>

Basidiospores- 2,800 Ct./m<sup>3</sup>

Unknown Dematiaceous spores- 160 Ct./m<sup>3</sup>

Outside:

Ascospores- 430 Ct./m<sup>3</sup>

Basidiospores- 2,100 Ct./m<sup>3</sup>

## Mold Types Present

Ascospore

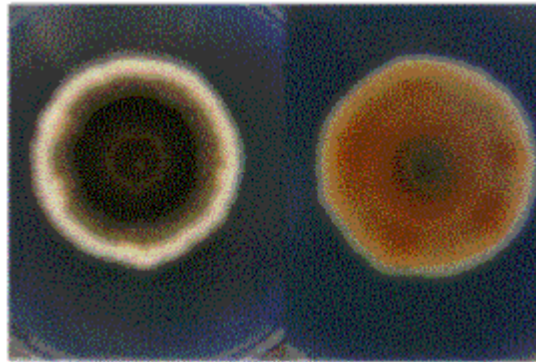
Phonetic: Ask-oh-spore

Ascospores are a general category of spores that have been produced by means of sexual reproduction (in a sack-like structure called an ascus). These are ubiquitous saprobes and plant pathogens, many of which are easily identifiable (i.e. Chaetomium). This group contains potential opportunistic pathogens, toxin producers, and allergens depending on the genus and species. A rupture in the top portion of the ascus disperses the spores during rain or in times of high humidity. Some asexual fungi, such as Aspergillus and Penicillium can become sexual under specific conditions; these are then considered ascomycetes and are given distinct names.

Aspergillus/Penicillium-like

Aspergillus is a common type I & III allergen. They are frequently isolated from forest products, soils, grains, nuts, cotton, organic debris, and water damaged building materials. Spores can also be found in moist ventilation systems and house dust. There are more than 160 different species of Aspergillus, sixteen of which have been documented as etiological agents of human disease but rarely occur in individuals with normally functioning immune systems. However, due to the substantial increase in populations of individuals with HIV, chemotherapy patients and those on corticosteroid treatment, contamination of building substrates with fungi, particularly Aspergillus is of concern. Aspergillosis is now the second most common fungal infection requiring hospitalization in the United States. Many Aspergillus species produce mycotoxins that may be associated with diseases in humans and other animals. Toxin production is dependent on the species or strain within the species and on the food source for the fungus. Some of these toxins, such as aflatoxins and ochratoxin are carcinogenic. Aspergillus is a common cause of extrinsic asthma with symptoms including edema and bronchospasms, and chronic cases may develop pulmonary emphysema. These fungi are frequently secondary opportunistic pathogens in patients with bronchiectasis, carcinoma, other mycoses, sarcoid, and tuberculosis. Some species can also cause onychomycosis (infection of the nail). ( $A_w = 0.71 - 0.94$ ). Culture - Potato dextrose agar or Malt extract

agar, 20° - 25°C, 7 – 10 days. Speciation of *Aspergillus* requires the culture of the fungus under different conditions of media, humidity, and temperature.



### Basidiospore

Phonetic: Buh-cyd-ee-oh-spore

Basidiospores are a general category of sexual spores that have been released from the basidium of a fungus. A ubiquitous type I & III allergen, saprobe and plant pathogen, mainly found in gardens, forests, and woodlands. Spores disseminate during rain or in times of high humidity. Rarely opportunistic pathogens, Basidiospores may produce toxins, including amanitins, monomethyl-hydrazine, muscarine, ibotenic acid, and psilocybin. Basidiospores are an agent of dry wood rot, which may destroy the structural wood of buildings.

### Humidity/Moisture Tests

Location	Type*	Moisture %**
Attic	Air	66.4
Attic	Pin	58.0
Cellar	Pin	19.5
Cellar	Air	60.1

\*Air- relative humidity test of the air

Pin- probe that penetrates 1/8 inch into the wood

Surface- measurement of moisture with surface scan

\*Moisture readings of above 60% relative humidity (percentage of water vapor in the air) create excellent conditions for mold growth. Readings above 20% in building materials are well suited for mold and wood destroying insects.

### Summary

The focus of this summary is to discuss the mold spores that are found inside the living space and exceed The American Conference of Government Industrial Hygienists (ACGHI) limits of an average of 50 to 500 spores per cubic meter (Ct./m<sup>3</sup>) or a ratio of inside to outside spore count of 10 to 33 percent.

Aspergillus is a common type I & III allergen. They are frequently isolated water damaged building materials. Spores can also be found in moist ventilation systems and house dust. Due to the substantial increase in populations of individuals with HIV, chemotherapy patients and those on corticosteroid treatment, contamination of building substrates with fungi, particularly Aspergillus is of concern. Aspergillosis is now the second most common fungal infection requiring hospitalization in the United States. Aspergillus is a common cause of extrinsic asthma with symptoms including edema and bronchospasms, and chronic cases may develop pulmonary emphysema. Levels exceeding this standard may have harmful human health affects. Your levels are almost 5X the suggested healthy levels. Over an extended period of time these spores could cause health risks.

Basidiospore:

Basidiospores spores disseminate during rain or in times of high humidity. Rarely opportunistic pathogens, Basidiospores are an agent of dry wood rot, which may destroy the structure wood of buildings. Levels exceeding this standard may have harmful human health affects. Your levels are over 5X the suggested healthy levels.

If the levels of these mold spores stay at the current level there may be health risks and risks to the structure of the home. With proper moisture control these molds will stop thriving and become dormant. The building is not showing serious moisture damage at this point and I think it can be remediated to prevent further problems.

### **Remediation**

The most important thing to do is to prevent water from entering this building. This includes properly grading the foundation soil, water sealing the crawl space, properly insulating and air sealing the attic, and installing ventilation in the roof. Roof mushroom style 6 inch vents should be installed on the roof at opposite ends of the attic and in the center of the attic. One square foot gable vents should also be installed on opposite ends of the attic roof. 15 inches of cellulose should be applied over the existing insulation once the area is dry. If necessary the existing fiberglass can be removed.

### **Photographs**

(See below)



Increase the slope of the soil meeting the foundation to 8 inches below the siding. A metal basement window soil dam with over can be installed in the basement window area. Prior to adding more soil, remove the old soil to a depth of 6 inches and to a distance of 36" from the foundation. Lay in a water proof landscape material sloping up to the foundation then cover with the amount of soil needed to bring the elevation up to 8 inches below the siding.



Add soil to within 8 inches of the wood siding and slope out 36 inches from the foundation. Plant grass seed in the non-garden areas.



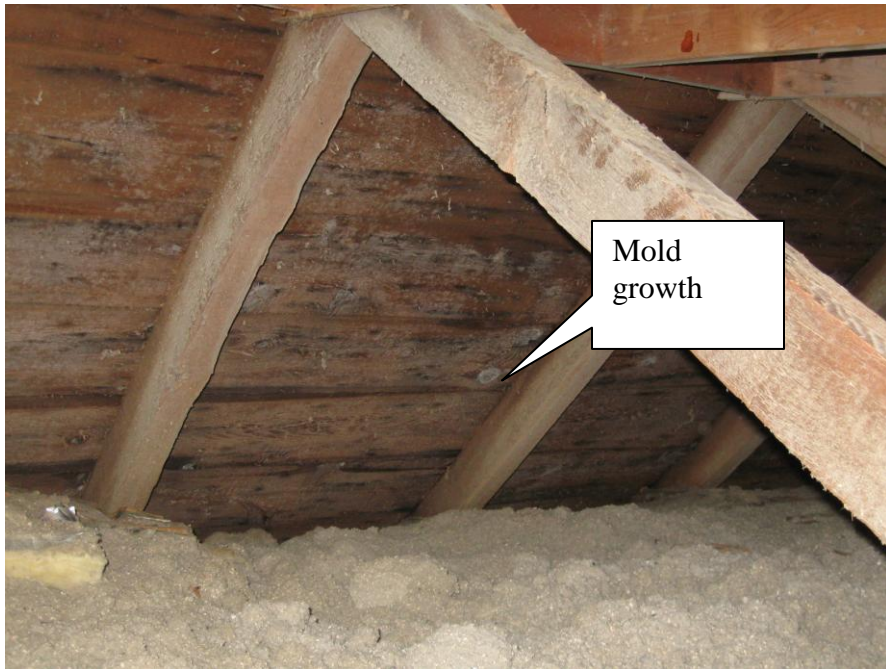
Remove gravel and follow previous instructions for garden area work.



The crawlspace needs rubber sheeting applied to it to seal it from water.



Soaked sheathing.



Mold growth



Add 15 inches of cellulose to the attic flat areas once the attic has been dried out.

### **Contractors**

Insulation Contractors:

Upright Frameworks LLC (all insulation and vent installation)

Joshua Wojcik

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[uprightframeworks@gmail.com](mailto:uprightframeworks@gmail.com)

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Wet Basements:

TC Hafford Basement

153 Branch Road

Wells, Maine 04090

800-734-6151

[www.tchaffordbasementsystems.com](http://www.tchaffordbasementsystems.com)

Heating:

Mid-Coast Energy Systems

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Bob Hardina

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