

Cadmus Environmental

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Mold Remediation Protocol



Homeowner: Mark Tom

ADDRESS: 22211 Wetherburn

c/o: Core 24/7 Restoration
Email: sgomez@core247restoration.com

DATE: May 13, 2019

Prepared by
Wendy V. Cadmus

Texas Mold Assessment Consultant
License #MAC1055, Expires June 16, 2020

Background Information

Moisture damage was observed at the base of the wall in the master bathroom. When the homeowner removed the baseboard he also observed mold growth so this inspection and mold remediation protocol were requested to provide the contractor with information on appropriate materials removal and cleaning.

This inspection was conducted in accordance with state regulations as well as current industry guidelines and practices. This assessment is not a certificate, assurance, warranty or guarantee of future conditions or performance, but is an assessment of the conditions present and detected on the date of this inspection.

Please note that while this inspection may point to possible moisture source(s), ultimately the identification and elimination of all moisture sources triggering mold growth is the responsibility of the client and/or property owner with the assistance of their contractors whether they are plumbing, roofing or HVAC, etc. It is critical that the moisture source be eliminated otherwise mold growth can return.



Moisture elevation and mold growth were observed on the exterior wall of the master bathroom.



Mold growth was observed at the base of the wall beside the shower/tub fixture wall in the master bathroom



The tub access panels for the hall bathroom and master bathroom are in the hall bathroom lower cabinet (see above left photo). The opening on the right side of this provides visual access to the area below the hall shower/tub. In the above right photo, mold growth was visible on the framing boards for the hall shower/tub where it backs up to the wall behind the master toilet.

Lab Results

Air Samples	
Location	Results
Exterior	Baseline
Master Bathroom	Elevated Levels of Mold Spores Identified: Aspergillus/Penicillium: 12,000 spores/m³ Chaetomium: 4,000 spores/m³ Stachybotrys: 10 raw spores
Den	Moderate Elevation of Airborne Mold Spores: Aspergillus/Penicillium: 1,400 spores/m³
Swab Sample	
Master Bathroom Wall	Mold Growth Detected: Chaetomium, Stachybotrys and Aspergillus/Penicillium

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Client: Cadmus Environmental
 Contact: Wendy Cadmus
 Project: Tom
 Date of Sampling: 05-13-2019
 Date of Receipt: 05-13-2019
 Date of Report: 05-14-2019

MoldREPORT
 EMLab P & K
 6000 Shoreline Ct, Ste 205, So. San Francisco, CA 94080
 (866) 888-6653 Fax (623) 780-7695

Summary of Sample Analysis Results

Do not take any action based on the results of this report until you have read the entire report.

Air Sample Summary:

The MoldSCORE™ was in the HIGH range for the following area(s): ST1. A high MoldSCORE™ indicates a high likelihood of mold growth in the area tested at the time of the inspection. If mold growth is in fact present, it should be cleaned or physically removed using appropriate controls and precautions by a trained professional and any associated water source that led to the problem should also be corrected.

The MoldSCORE™ was in the MODERATE range for the following area(s): ST2. A moderate MoldSCORE™ means that the results are inconclusive, and suggests that a more detailed inspection by a trained professional may make sense if there are any other reasons to believe that mold growth could be a problem in this room.

Please see the sections titled "Detailed Results of the Air Sample Analysis" and "Understanding Your Air Sample Analysis Results" for important additional information.

Location	MoldSCORE™	Exposure Level																			
ST1: Master bathroom * see p. 4 for details	<table border="1"> <tr> <td>Lower ≤110</td> <td>200</td> <td>Higher 300</td> <td>Mold Score</td> </tr> <tr> <td colspan="3"></td> <td>300</td> </tr> </table>	Lower ≤110	200	Higher 300	Mold Score				300	<table border="1"> <tr> <td>Lower ≤200</td> <td>1K</td> <td>Higher ≥70K</td> <td>10K</td> <td>Location spores/m³</td> <td>Outside spores/m³</td> </tr> <tr> <td colspan="3"></td> <td>17,000</td> <td>11,000</td> </tr> </table>	Lower ≤200	1K	Higher ≥70K	10K	Location spores/m ³	Outside spores/m ³				17,000	11,000
Lower ≤110	200	Higher 300	Mold Score																		
			300																		
Lower ≤200	1K	Higher ≥70K	10K	Location spores/m ³	Outside spores/m ³																
			17,000	11,000																	
ST2: Den * see p. 5 for details	<table border="1"> <tr> <td>Lower ≤110</td> <td>200</td> <td>Higher 300</td> <td>Mold Score</td> </tr> <tr> <td colspan="3"></td> <td>236</td> </tr> </table>	Lower ≤110	200	Higher 300	Mold Score				236	<table border="1"> <tr> <td>Lower ≤200</td> <td>1K</td> <td>Higher ≥70K</td> <td>10K</td> <td>Location spores/m³</td> <td>Outside spores/m³</td> </tr> <tr> <td colspan="3"></td> <td>2,400</td> <td>11,000</td> </tr> </table>	Lower ≤200	1K	Higher ≥70K	10K	Location spores/m ³	Outside spores/m ³				2,400	11,000
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			236																		
Lower ≤200	1K	Higher ≥70K	10K	Location spores/m ³	Outside spores/m ³																
			2,400	11,000																	

Surface Sample Summary:

The surface sample results of DE1 indicated mold growth on the surface(s) sampled at the time of sampling.

Please see the sections titled "Detailed Results of the Surface Sample Analysis", "Understanding Your Surface Sample Analysis Results", "Important Information, Terms and Conditions" and "Scope and Limitations" for additional information.

Location	Mold Growth	Dominant Types
DE1: Master bath wall * see p. 10 for details	Mold Growth	Chaetomium species Stachybotrys species Penicillium/Aspergillus group

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Laboratory Results

MoldREPORT: Spore Trap Analysis

Location:	ST1: Master bathroom		ST2: Den		OS: Exterior	
Comments (see below)	None		None		None	
Lab ID-Version†:	10246338-1		10246339-1		10246340-1	
Analysis Date:	05/14/2019		05/14/2019		05/14/2019	
Spore types detected:	raw ct.	per m ³	raw ct.	per m ³	raw ct.	per m ³
Aureobasidium	-	-	-	-	-	-
Basidiospores	-	-	6	320	52	2,800
Chaetomium	75	4,000	-	-	-	-
Cladosporium	6	670	6	320	16	850
Fusarium	-	-	-	-	-	-
Penicillium/Aspergillus types	105	12,000	27	1,400	33	1,800
Stachybotrys	10	130	-	-	-	-
Trichoderma	-	-	-	-	-	-
Ulocladium	-	-	-	-	-	-
Others	8	310	7	370	102	5,300
§ Total:		17,000		2,500		11,000
Additional Information:						
Hyphal fragments	3,600		-		-	
Skin cells	> 13,000		80 - 4,000		13 - 67	
Pollen	40		< 13		27	
Background debris (1-4)‡	4		2		3	
Limit of detection	13		13		13	
Sample volume (liters)	75		75		75	

Comments:

Basidiospores (basidiomycetes): Basidiospores are extremely common outdoors and originate from fungi in gardens, forests, and woodlands. It is rare for the source of basidiospores to be indoors. However, basidiospores may be an indicator of wood decay.

Cladosporium: One of the most commonly found molds outdoors and frequently found growing indoors. Spores from Cladosporium are generally present in outdoor and indoor air, even in relatively clean, mold-growth-free, indoor environments. Levels vary based upon activity levels, weather conditions, dustiness, outside air exchange rates, and other factors.

Penicillium/Aspergillus types: Penicillium and Aspergillus are among the most common molds found growing both indoors and outdoors (even in relatively clean, mold-growth-free, indoor environments). Levels vary based upon activity levels, dustiness, weather conditions, outside air exchange rates, and other factors.

Stachybotrys and other marker types: Certain types of mold, such as Aureobasidium, Chaetomium, Fusarium, Trichoderma, and Ulocladium, are generally found in very low numbers outdoors. Consequently their presence indoors, even in relatively low numbers, is often an indication that these molds are originating from growth indoors. When present, these mold types are often the clearest indicator of a mold problem.

Others: Molds in the "Others" category are generally found outdoors in moderate numbers, and are therefore not considered markers of indoor growth.

† A "Version" indicated by "-x" after the Lab ID# with a value greater than 1 indicates a sample with amended data. The revision number is reflected by the value of "x".

‡ Background debris is an indication of the amounts of non-biological particulate matter present on the slide (dust in the air) and is graded from 1 to 4 with 4 indicating the largest amount.

The analytical sensitivity is the spores/m³ divided by the raw count, expressed in spores/m³. The limit of detection is the analytical sensitivity (in spores/m³) multiplied by the sample volume (in liters) divided by 1000 liters.

§ Total has been rounded to two significant figures to reflect analytical precision.

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Affected Areas Requiring Remediation

- Master Bathroom
- Den – place 2 air scrubbers in the den and entry/office areas

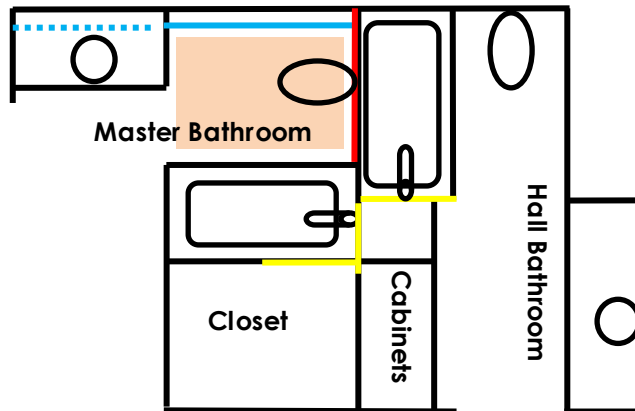
Less than 25 contiguous square feet of mold damaged building materials were visible at the time of this inspection and so, based upon Texas Mold and Remediation Rules, remediation work performed on this residence does not have to be registered with the state of Texas.

Remediation in these areas should be performed under limited containment as described in this protocol.

- Remove damaged porous building materials as indicated in the diagram and clean all non-porous or semi-porous materials remaining in the remediation area. **As always,** if additional mold damaged building materials are observed, beyond what is specified in the diagram, then this material should also be appropriately remediated.

Approximate materials removal: 28 – 40 sq. feet of sheetrock and insulation and possible removal of 4 linear foot sink cabinet

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- Remove bottom 2' of sheetrock. Clean area under hall bathroom tub including all sides of the framing boards.
- Remove 2' – 4' of exterior wall sheetrock and insulation. Identify and eliminate the moisture source
- ⋯ To determine how far the mold damage extends it may be necessary to open the wall behind the master sink cabinet. If mold growth extends into this area, the sink cabinet should be removed along with the bottom 2' – 4' of sheetrock and insulation.
- It may be necessary to open the bottom 1' – 2' of these walls to fully access and assess the areas below the tubs for mold damage
- The homeowner lifted a piece of tile and he reported observing moisture under this tile. Another layer of tile flooring was observed below the current floor. The source for this moisture should be identified and eliminated.

Note: The following detailed instructions are written for use by a licensed mold remediation contractor since they are required by their license to follow the steps included in a protocol during remediation. If the property owner elects to DIY or hire a general contractor these steps are probably more arduous than will be followed but can provide some guidance in the work.

General Items That Apply to All Remediation Projects

Remediation contractors and all other parties involved with removal and remediation of water damaged and mold contaminated materials as specified in or arising from this Protocol must conduct that work in accordance with generally accepted practices for that industry. Those practices may include, but are not limited to, guidance provided by the Environmental Protection Agency (*Mold Remediation in Schools and Commercial Buildings*) and IICRC S500 – *Standard and Reference Guide for Professional Water Damage Restoration*, and/or IICRC S520 – *Standard and Reference Guide for Professional Mold Remediation* (Institute of Inspection, Cleaning and Restoration, Vancouver, Washington), as revised or amended; and all other applicable local, state and federal requirements.

Prior to the Start of Remediation

- 1 Submit any Pre-Approval Items (Health and Safety Plan, MSDSs for any chemicals used).
- 2 Obtain all necessary permits.
- 3 Establish Controlled Access Work Area(s).
- 4 Ensure entire building (areas that will be contained and areas that will not be contained) is de-humidified, so that relative humidity remains below 65%. Ensure dehumidifier hoses are routed to existing drains and not out windows, doors, etc.

During Remediation

- 1 Double-bag all mold contaminated materials (gypsum board, carpet, wood, etc.) in 6 mil poly bags, goose neck and tape the bags, and then HEPA-vacuum the bags prior to removal from the containment area. Material that is too large for bagging should be double-wrapped and taped. Sharp objects should be blunted or taped to reduce the likelihood of piercing bags or wrapping.
- 2 Monitor remediation progress by observation and testing.
- 3 **Detergent solutions** should be used when removing visible mold or stains from structural components, finish surfaces, or furniture.
- 4 Visibly damaged, highly porous materials such as gypsum board or particle board should be removed rather than cleaned. If there is any carpet/padding adjacent or within the impact area, then this porous material should be removed. Any discolored carpet tack strips should be removed.
- 5 Structural components and finish surfaces within the remediation area and the interior surfaces of the containment should be **wire brushed and HEPA-vacuumed** prior to post-remediation clearance assessment.
- 6 All exterior walls and ceilings exposed to the attic should be sealed with a heavy poly barrier to prevent exterior air from infiltrating the containment.
- 7 Use your professional judgement about sealing additional walls or structural items.

All building materials should be completely dry prior to post remediation inspection and testing.

Inspection of the remediation area by the project supervisor is critical prior to scheduling post remediation testing.

After Remediation

- 1 Dehumidification equipment should continue to be operated prior to clearance sampling and until test results have shown successful completion of remediation. If delays in rebuild are expected, steps should be taken to ensure that relative humidity levels continue to be controlled within the project.
- 2 After debris removal and cleaning are complete, the HEPA-filtered air scrubbers should be operated in recirculation mode for 24 - 48 hours.
- 3 Antimicrobial coatings may not be applied until the project achieves clearance.

Project Specific Remediation Requirements

Personal Protective Equipment Plan:

- Respiratory Protection: N-95 Respirators should be worn by remediation workers as a minimum.
- Eye Protection: Safety Goggles with indirect venting.
- Body Covering: Tyvek or similar type disposable fabric suit, including attached hood and shoe covers.
- Hand Protection: Leather or fabric gloves to protect from cuts and abrasions.

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Containment Requirements:

It may be necessary to use any of the containment protocols described below, on this project. Individual rooms or project areas will list containment requirements specific to that area.

Surface (Limited) Containment

- a. Use single-layer 6 mil poly sheeting on floor surfaces, and at least 4 mil poly sheeting on all other surfaces, except those surfaces to be remediated. In some instances it may be necessary to erect a framed containment rather than placing poly sheeting directly on surfaces. In some instances it may be necessary for containment to be installed above a drop ceiling grid. Entrances should be typical slit entry design with a flap or zipper entry on the outside of the slit.
- b. Seal all air conditioning supply vents and return air vents in the containment.
All exterior walls and ceiling exposed to the attic should be sealed with a heavy poly barrier to prevent exterior air from infiltrating the containment.
Use your professional judgement about sealing additional walls or structural items.
- c. Maintain negative pressure at all times by the use of a HEPA-filtered air scrubber exhausted to the outside the containment, preferably outside the building. Inspect or test the negative pressurization daily. If negative pressure fails during remediation, stop work immediately and make repairs.
- d. Place notification signs as required in TAC 295.322(e).
- e. When removal and cleaning is complete the air scrubbers should be switched to recirculating mode for 24 – 48 hours.
- f. Leave containment in place until written certification of clearance is provided by Cadmus or another licensed mold assessment consultant.

No Containment Required

- a. If no containment is required in a work area, this will be stated in the description.

Use of Disinfectants, Biocides and Antimicrobial Coatings per TAC 295.321(h) and TAC 295.323(c)

These products may be used on remediated surfaces on this project, but they may not be used in or on HVAC system components due to the nature of the building occupancies. If they are used, they must be registered by the Environmental Protection Agency (EPA), and the remediation contractor shall follow all manufacturers' label directions when using the product. These products must be labeled for their specific use and location. **Antimicrobial coatings may not be applied until the project achieves clearance.**

Certificate of Mold Damage Remediation

The Texas Mold Assessment and Remediation Rules (**295.327(b)(1) and (2)** in part) require the licensed mold assessor (Cadmus) to provide to the licensed mold remediator a Certificate of Mold Damage Remediation which includes the following:

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“(1) a statement by a licensed mold assessment consultant (not the licensed mold remediator) that based on visual, procedural, and analytical evaluation, the mold contamination identified for the project has been remediated as outlined in the mold remediation protocol; and (2) a statement on the certificate that the underlying cause of the mold has been remediated, if the licensed mold assessment consultant determines that the underlying cause of the mold has been remediated so that it is reasonably certain that the mold will not return from that same cause.”

The licensed mold remediator shall then provide the Certificate of Mold Damage Remediation to the property owner according to **295.327(b)**, and according to **295.327(d)**, “If a property owner sells the property, the property owner shall provide to the buyer a copy of each remediation certificate that has been issued for the property under this section.”

This Protocol is based on the assumption that conditions that caused excessive moisture and resulting mold growth, have been corrected or will be corrected as part of the remediation.

Clearance Criteria- testing during remediation

With the client's permission, Cadmus may inspect the remediation project while it is in progress to confirm that remediation is being performed in accordance with this Protocol. Cadmus may use visual inspection, photographs or analytical tools to perform such inspections.

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Post Remediation Assessment and Clearance

Confirmation of Cause and Origin Repair

The underlying cause of the mold growth and moisture source must have been successfully repaired. Compliance with this criterion may be met by one of the following methods:

- Repairs must be made by licensed, insured building contractors in trades appropriate to the repairs. This may include but is not limited to roofing, plumbing, foundation repairs, and air conditioning design and cleaning.

We will require verification, either verbal or written, of these repairs in advance of our clearance inspection.

Note: Per TAC 295.324(b) Underlying cause of mold. Post-remediation assessment shall, to the extent feasible, determine that the underlying cause of the mold has been remediated so that it is reasonably certain that the mold will not return from that remediated cause. The homeowner or responsible party is required to address the moisture issue, it is not the responsibility of the mold consultant to address the moisture issue.

Prior to certifying clearance, Cadmus will:

- inspect for visible mold and wood rot;
- inspect structural materials for the presence of elevated moisture content;
- collect surface swab samples for microscopic and microbiological analysis to determine if elevated mold spore levels are present in the project area;
- collect spore trap air samples to determine if elevated mold spore levels are present in the project area;
- Inspect to determine if the underlying cause of the mold growth has been successfully remediated or repaired. This may include, but is not limited to, performance of various tests to determine if moisture sources have been corrected.
- It may be necessary to make cuts in containment sheeting to inspect the walls and collect swab samples from exterior wall studs, sill plates, etc.
- **After debris removal and cleaning are complete, the HEPA-filtered air scrubbers should be operated in recirculation mode for a minimum of 24 – 48 hours with a 48 hour post remediation scrub being ideal if time allows.**

To certify clearance the following three conditions must be met:

1. No visible mold or wood rot in the remediation area;
2. No elevated moisture content in structural materials as measured with an appropriate moisture meter;
3. The following **sampling results criteria** must be met:

Indoor Air Microscopic Evaluation

Total spores per cubic meter (m³) of air in each indoor air sample must be similar to or less than the total spore average of the outdoor samples. Further standards may also be imposed based on the pre-remediation air and surface sample results.

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Total *Aspergillus/Penicillium*-like spores in indoor samples must be similar to or less than the average of *Aspergillus/Penicillium*-like spores in the outdoor air samples and additionally should be lower than 500 spores/m³.

Clearance Sampling Strategy

Surface Samples:

- If any visually questionable areas are identified during the clearance inspection, then surface swab sample will be collected of the questionable area.

Air Samples

- A minimum of one outside air sample will be collected.
- A minimum of one air sample will be collected from the containment area. An air sample may also be taken from outside containment.

Samples outside Containment

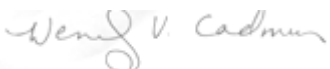
- Cadmus reserves the right to perform sampling inside the building but outside of remediation containment to confirm that containment was effective in preventing the release of mold spores outside of containment. These samples will be evaluated in accordance with **sample results criteria** shown above.

Note: Per TAC 295.324(c) (3): "Where visual inspection reveals deficiencies sufficient to fail clearance, analytical methods need not be used." (Additionally, if elevated moisture content is found in structural materials as measured with an appropriate moisture meter, this will be sufficient to fail clearance without collecting mold samples.)

Project Coordination between Remediation Company and Consultant

Coordination between the project's Assessment Consultant and the Remediation Contractor is essential in achieving a complete remediation project and first-time clearance post-remediation evaluation. The Remediation Contractor should immediately contact the Assessment Consultant if any of the following circumstances occur:

- Additional water damage and/or mold amplification is encountered that may alter the Scope of Work.
- Any time there is concern regarding the containment area construction, extent of demolition and/or effectiveness of the sanitization process.



Please contact me if you have any questions on information in this report.

Very truly yours,

Wendy V. Cadmus

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Health Concerns

The degree of risk from exposure to mold is determined by a person's general health and pre-existing sensitivity to mold, as well as the concentration of the mold bloom.

Harvard Preserve January 16, 2007

Mold spores are present throughout our outdoor environment and provide a useful function in recycling organic materials. Every building has mold spores and fragments present within their interior and so we all have contact with mold on a daily basis both outdoors and indoors. The most common negative reaction is an allergic response of sneezing, eye irritation and runny nose, etc similar to seasonal allergies. Some molds produce airborne toxins called mycotoxins that can cause serious breathing difficulties, dizziness, and flu-like symptoms and bleeding in the lungs even with healthy individuals if the size of growth and exposure time is high enough. The elderly, infants, pregnant women, immune-compromised individuals, chemotherapy patients and individuals with respiratory problems are the most susceptible to infections and disease that can result from too much exposure to toxic and pathogenic molds. The size of the area of mold growth and the frequency of exposure to the mold can affect response. For example, Farmer's Lung is an allergic disease caused by breathing in the dust from moldy hay.

Preventing and Eliminating Mold

Mold needs moisture and organic material to grow. Since mold growth can occur within 24 – 48 of water intrusion conditions identifying and eliminating the source of moisture and removing any remaining moisture needs to occur as soon as possible.

If you find mold growth in your home the best course of action is dry up any moisture and identify and eliminate the source of moisture. The mold growth needs to be removed either through cleaning or by replacing the material, depending upon the building material affected and the size of the growth. Hard surfaces, such as tile, concrete and metal can be cleaned using a sponge and a mixture of water and detergent. Even if mold has gone dormant from a lack of moisture or organic food, it needs to be cleaned because once moisture returns it will resume growth.