# Mold Growth
# Cause and Origin Assessment
# and
# Mold Remediation Protocol

Blanck Residence
2212 Tuscany Way
Boynton Beach, FL 33435

AirSpec Project # ML18111215

Project Requested By:

Paul Mungai
RYZE Claim Solutions
On Behalf Of
Southern Oak Insurance
830 A1A North, Suite 13326
Ponte Vedra Beach, FL 32082

Southern Oak Insurance Claim # 37997


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# Introduction

This report presents the findings from a mold assessment conducted at the subject residence. The purpose of this mold assessment was to determine the cause and origin of the reported water and/or mold damage inside the residence, to provide recommendations for corrective actions, and to develop a prudent mold remediation protocol, if necessary.

Mark E. Levy conducted this assessment on November 23, 2018. Mr. Levy has been an Indoor Environmental Professional (IEP) for over 18 years and has conducted thousands of environmental investigations. Mr. Levy is a Certified Indoor Environmental Consultant (acac.org) and is a Florida Licensed Mold Assessor (MRSA 2160).

After the assessment, AirSpec forwarded all mold spore samples to INX Laboratories in Clermont, FL. INX Laboratories participates in the American Industrial Hygiene Associations' (AIHA) Environmental Microbiology Proficiency Analytical Testing Program (EMPAT #151568). In addition, INX participates in the AIHA Fungal Direct Exam. Both programs test the accuracy of microbiological analysis. INX consistently ranks in the 90$^{th}$ percentile nationwide.

After all information and data was collected, the assessor prepared this report. After completion, the report is forwarded to the AirSpec Technical Analyst for technical review. The AirSpec technical analyst is Dr. Kathleen Steepy.

Dr. Steepy has a Bachelor of Science degree in Microbiology from Carnegie Mellon University and a Doctorate of Medicine degree from Temple University. Dr. Steepy has extensive experience in both basic scientific and clinical research. She has coauthored multiple scientific publications and actively practiced in the medical field for 27 years. She has field experience in mold assessment, mold remediation, and residential construction.

A final report approval is then conducted by Mike Steepy, CIH, CSP, CIEC. Mr. Steepy is a Certified Industrial Hygienist (abih.org), Certified Safety Professional (bcsp.org), Certified Indoor Environmental Consultant (acac.org), Florida Certified Residential Contractor (CRC1328072), and a Florida Licensed Mold Assessor (MRSA76). Mr. Steepy has been in the indoor air quality field for over 25 years.

This report is arranged in the following order:

1 Background Information
2 Key Findings
3 Cause and Origin with Timeline
4 Recommendations
5 Remediation Protocol
6 Supporting Data
7 Limitations
8 Laboratory Sample Analysis Results
9 Further Information and References

AirSpec appreciates the opportunity to be of service to all parties involved on this project. We look forward to further correspondence. Keep in mind that AirSpec can provide additional services in the form of project oversight and/or post-remediation inspections. Feel free to call AirSpec at 321-251-6656 if you have any questions concerning this project.

Assessed by,

Mark E. Levy, CIEC
Building Scientist
FL Lic. Mold Assessor MRSA2160

Reviewed by,

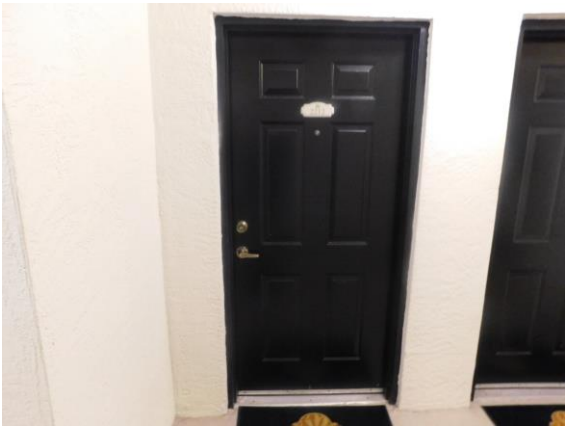
Dr. Kathleen Steepy
Technical Analyst

Approved by:

Mike Steepy, CIH, CSP, CIEC
FL Lic Mold Assessor MRSA76

# 1
# Background Information

The Blanck residence is a 2nd floor condominium in the Tuscany on the Intracoastal Condominium Complex. According to the Palm Beach County Property Appraiser, the residence was built in 2002 and has 750 ft.² of living area.



The subject unit is owned by Kenneth and Maria Blanck and the unit is utilized for rental purposes. Access to the property along with relevant background information was provided by the tenant. It was related that the unit is currently up for sale and during a property "due diligence" for a potential buyer, mold growth was discovered on the air handler closet drywall and on the TV room, kitchen, and bedroom air supply vents. AirSpec learned that this condition had been present for several months. There are no known plumbing leaks and the AC system is used on a regular basis (including regular filter changes).

# 2
# Key Findings

- Air Handler Closet: Superficial visible mold growth was observed on the closet drywall. Seam tape deficiencies and holes in the main supply duct were seen. This condition is allowing cool air to escape into the closet resulting in the formation of condensation on the AHU closet drywall.

  AirSpec collected a Condition 3 mold spore surface sample directly from the mold growth found on the HVAC closet drywall. Condition 3 surface sampling is a sampling method designed to prove the existence of mold growth. A Condition 3 environment is an indoor environment contaminated with the presence of actual mold growth and associated spores. Actual growth includes growth that is active or dormant, visible or hidden. Laboratory analysis determined Aspergillus/Penicillium spp. mold amplification on the sampled surface.

Aspergillus/Penicillium molds are commonly found on building materials that are exposed to a water or moisture source. These sources can include overflows, pipe leaks, flooding, and/or chronic exposure to elevated relative humidity. Aspergillus/Penicillium molds are primary colonizers and can be found on wet building materials within 3-5 days of initial exposure to moisture. The colonization of Aspergillus/Penicillium can be halted with the prompt application of structural drying processes within 3 days of the initial water infiltration event.

- Supply Vents: Visible particulate adhesion (that may include mold spores) was found on the air supply diffusers and downwind ceiling surfaces particularly in the TV room, kitchen, bathroom, and bedroom. The filth pattern (ghosting) is in the direction of the airflow out of the diffusers. This finding indicates that the filth is emanating from the ducts and air handler and adhering to the ceiling surface. Ultimately, these particles originate in the residence or from the outdoor environment. This ghosting effect is commonly caused by improperly fitted filters, the absence of a filter, dirty filters that allow air bypass, loose fitting panel covers that allow air bypass around the cover, or a combination of some, or all of these configurations. These are all related to a lack of maintenance and cleaning deficiencies. The particles are deposited on the cooler diffuser and ceiling surfaces as a result of electrostatic forces, vapor pressure, direct impingement, and temperature differentials. This diffuser and ceiling filth can be cleaned from the diffuser and ceiling surfaces with a detergent and a soft brush. Gaps between the supply vents and ceiling drywall resulted in warmer air from the ceiling cavity mixing with the cooler air from the HVAC system, forming condensation and facilitating mold growth.

  AirSpec collected a Condition 3 mold spore surface samples directly from the mold growth found on the kitchen supply and bathroom supply vents. Condition 3 surface sampling is a sampling method designed to prove the existence of mold growth. A Condition 3 environment is an indoor environment contaminated with the presence of actual mold growth and associated spores. Actual growth includes growth that is active or dormant, visible or hidden. Laboratory analysis determined Aspergillus/Penicillium mold amplification on the kitchen supply vent sampled surface and Aspergillus/Penicillium and Cladosporium spp. mold amplification on the bath supply vent sampled surface.

  Cladosporium is a genus of fungi including some of the most common indoor and outdoor molds. Many species of Cladosporium are commonly found on living and dead plant material. Cladosporium can begin to colonize indoor building materials when the relative humidity reaches 82% and/or the moisture content of the building material reaches approximately 20%.

- HVAC System: The residence was equipped with a Rheem air handler Model RF1T2421MTANJAN00417; a nominal 1.5 to 2-ton system that conditions approximately 750 square feet. Based on a rough calculation of about one (1) ton of cooling per 500 square feet of floor space in residential construction, the system appears to be appropriately sized for the residence. The AHU itself and its components were in a relatively clean condition.

The cooling cycle was initiated by AirSpec. The temperature exiting the HVAC AHU coils was measured to be 60°F (with a room temperature of about 73°F), for a change of temperature across the coils (ΔT) of approximately 13°F. Typically, the ΔT of a residential system should be between 18° and 20°F; therefore, the HVAC system was not operating within optimal parameters. A change of temperature across the coils (ΔT) of less than 17°F can result in an increase in indoor relative humidity. Low refrigerant or a bad capacitor is the common cause of the minimal temperature differential. An HVAC contractor should be hired to determine the cause of this malfunction.

- Mold Spore Sampling: AirSpec did not collect mold spore air or mold spore settlement surface samples (IICRC Condition 2) inside this residence because there was less than 10 contiguous square feet of mold growth. When there is less than 10 contiguous square feet of mold growth inside a residence, a mold remediation project does not require compliance with the Florida Mold Law. Accordingly, this particular project is considered a maintenance activity. A maintenance activity does not require negative air pressure, containment barriers, or any other mold specific engineering control. Likewise, licensed mold remediators are not required. The law assumes that fugitive mold spores will not be a factor in the mold remediation. Therefore, it is imprudent to collect mold spore air and surface samples when compliance with the mold law is not required.

- Temperature and Humidity: The indoor temperature (74ºF) and relative humidity (66%) were measured at the time of this assessment. *The American Society of Heating, Refrigerating, and Air-conditioning Engineers (ASHRAE) Standard 55-2013 titled, "Thermal Environmental Conditions for Human Occupancy", specifies the combinations of indoor space environment and personal factors that will produce thermal comfort conditions acceptable to 80% or more of the occupants within a space. A temperature range from between approximately 67 to 82º F degrees is recommended. ASHRAE Standard 62.1-2013 titled "Ventilation for Acceptable Indoor Air Quality" recommends that relative humidity levels be maintained below 65% to reduce the possibility of microbial growth.*

  Humidity levels below 65% will control mold growth. Humidity levels below 50% will control dust mites. At the measured levels, further mold colonization as a result of indoor environmental atmospheric conditions is not anticipated.

# 3
# Cause and Origin with Timeline

## Causation Summary

Causation No. 1: Based on our findings it is Air Spec's professional opinion that chronic* condensation formation from gaps in the supply ductwork has resulted in mold growth on the AHU closet drywall.

Causation No 2: Based on our findings it is Air Spec's professional opinion that the cause of the mold growth on the supply air vents is a result of chronic* lack of maintenance and gaps between the vent and drywall.

## Causation Tables

Based on the assessment findings, it is AirSpec's professional opinion that there are multiple causations for the water and/or mold damages inside the residence.

Causation No. 1: Chronic* condensation formation air escaping from voids in the supply ductwork has resulted in mold growth on the AHU closet drywall.

**AirSpec identifies each causation as short-term (a few days to one week), long-term (one week to one month), or chronic (months to years) exposure to moisture. This classification is based on the maturity of the mold growth, severity of water damage, experience, professional opinion, and in some cases, species of mold present.*

The above causation is explained in more detail using the following tables:

Table A provides data on the water infiltration and/or mold growth from AirSpec's interpretation based on the evidence present.

| | Yes | No | n/a |
|---|---|---|---|
| Causation Hidden | | X | |
| Causation Unknown | X | | |
| Water Infiltration Hidden | | | X |
| Mold Growth Hidden | | X | |

Table B provides AirSpec's timeline interpretation based on the evidence present. The timeline categorization is based on the maturity of the mold growth, severity of water damage, experience, professional opinion, research, and in some cases, species of mold present.

| | Yes | No |
|---|---|---|
| More than 14 Days Elapsed Between Onset and Corrective Action | X | |
| More than 30 Days Elapsed Between Onset and Corrective Action | X | |

Table C Provides data on the type of loss to the structure based on the evidence present.

| | Yes | No | n/a |
|---|---|---|---|
| Sudden and Accidental Discharge | | X | |
| Plumbing Leak | | X | |
| HVAC Condensate Overflow or Leak | | X | |

| | | | |
|---|---|---|---|
| Building Envelope Leak | | X | |
| Condensation | X | | |
| Elevated Humidity | X | | |
| Rising Groundwater | | X | |
| Property Vacant > 30 Days | | X | |
| Wear and Tear | X | | |
| Deterioration | | X | |
| Settling | | X | |
| Flooding | | X | |
| Overflow | | X | |
| Repeated Seepage | X | | |
| Power Failure | | X | |
| Lack of Maintenance | X | | |
| Neglect After Loss | | X | |
| Intentional Loss, Acts | | X | |
| Faulty, Inadequate, Defective Design | | X | |

Table D provides data on the type of loss to the contents.

| | Yes | No | n/a |
|---|---|---|---|
| Water Damage | | X | |
| Condensation, Humidity | | X | |

Table E provides data on the location and extent of the mold colonization.

| | Yes | No | n/a |
|---|---|---|---|
| Mold Growth on Building Materials | X | | |
| Mold Growth on Contents | | X | |
| Mold Spore Settlement on Contents | | X | |
| Mold Growth Greater than 10 Contiguous Square Feet | | X | |
| Licensed Mold Remediator Required (if contracted) | | X | |
| Barriers, Neg. Air Filtration, etc. Required | | X | |

Causation No 2: Based on our findings it is Air Spec's professional opinion that the cause of the mold growth on the supply air vents is a result of chronic* lack of maintenance and gaps between the vent and drywall.

**AirSpec identifies each causation as short-term (a few days to one week), long-term (one week to one month), or chronic (months to years) exposure to moisture. This classification is based on the*

*maturity of the mold growth, severity of water damage, experience, professional opinion, and in some cases, species of mold present.*

The above causation is explained in more detail using the following tables:

Table A provides data on the water infiltration and/or mold growth from AirSpec's interpretation based on the evidence present.

| | Yes | No | n/a |
|---|---|---|---|
| Causation Hidden | | X | |
| Causation Unknown | X | | |
| Water Infiltration Hidden | | | X |
| Mold Growth Hidden | | X | |

Table B provides AirSpec's timeline interpretation based on the evidence present. The timeline categorization is based on the maturity of the mold growth, severity of water damage, experience, professional opinion, research, and in some cases, species of mold present.

| | Yes | No |
|---|---|---|
| More than 14 Days Elapsed Between Onset and Corrective Action | X | |
| More than 30 Days Elapsed Between Onset and Corrective Action | X | |

Table C Provides data on the type of loss to the structure based on the evidence present.

| | Yes | No | n/a |
|---|---|---|---|
| Sudden and Accidental Discharge | | X | |
| Plumbing Leak | | X | |
| HVAC Condensate Overflow or Leak | | X | |
| Building Envelope Leak | | X | |
| Condensation | X | | |
| Elevated Humidity | X | | |
| Rising Groundwater | | X | |
| Property Vacant > 30 Days | | X | |
| Wear and Tear | X | | |
| Deterioration | | X | |
| Settling | | X | |
| Flooding | | X | |
| Overflow | | X | |
| Repeated Seepage | X | | |
| Power Failure | | X | |
| Lack of Maintenance | X | | |

| | | | |
|---|---|---|---|
| Neglect After Loss | | X | |
| Intentional Loss, Acts | | X | |
| Faulty, Inadequate, Defective Design | | X | |

Table D provides data on the type of loss to the contents.

| | Yes | No | n/a |
|---|---|---|---|
| Water Damage | | X | |
| Condensation, Humidity | | X | |

Table E provides data on the location and extent of the mold colonization.

| | Yes | No | n/a |
|---|---|---|---|
| Mold Growth on Building Materials | X | | |
| Mold Growth on Contents | | X | |
| Mold Spore Settlement on Contents | | X | |
| Mold Growth Greater than 10 Contiguous Square Feet | | X | |
| Licensed Mold Remediator Required (if contracted) | | X | |
| Barriers, Neg. Air Filtration, etc. Required | | X | |

# 4
# Recommendations

- Repair any gaps or voids in the HVAC supply system and around air supply vents.
- Have the HVAC system serviced and restored to a fully operational state. Once repaired, routine maintenance should be conducted, ie: clean the air handler, air returns, and ductwork. Replace the filters. *A full cleaning of the HVAC system should be conducted about every 5-7 years.*
- Remove the water damaged and/or mold colonized building materials from the air handler closet closet area in order to prevent structural damage and possible adverse health effects to occupants. The water and mold damages found in each work area is less than 10 contiguous square feet and therefore does not require the use of a licensed mold remediator; nor does it require the use of air scrubbers, containment barriers, negative pressure, or any other mold-specific engineering controls. Refer to the mold remediation protocol in Section 5 of this report.

# 5
# Mold Remediation Protocol

Blanck Residence
2212 Tuscany Way
Boynton Beach, FL 33435

**Scope of Work – Microbial Decontamination, Drying, and Clearance Testing**

The Scope of Work that addresses microbiological decontamination includes but is not limited to the following activities in the residence.

Project Note: The water and mold damages found in each work area is less than 10 contiguous square feet and therefore does not require the use of a licensed mold remediator; nor does it require the use of air scrubbers, containment barriers, negative pressure, or any other mold-specific engineering controls. *(If greater than 10 contiguous square feet of mold colonization is discovered during removal activities, immediately stop all removal, cover the wall and/or exposed cavity with 6-mil plastic using tape to seal it shut, and then contact a Florida licensed mold remediation company to finish the removal and mold clean-up. Proper procedures (IICRC S-520) must be followed in order to ensure the mold is cleaned up entirely without contaminating other areas of the residence.) If extensive additional remediation is required, contact AirSpec and provide a description.*

Preliminary Remediation Requirements:

- The work areas shall include the air handler closet.
- If the A/C unit is not used, dehumidifiers may be required to keep humidity levels below 65%.
- Contents: Move all contents from the immediate work areas to a non-work area of the residence.

Remediation: Universal safe handling precautions should be utilized. Any mold-contaminated building materials should be HEPA vacuumed then removed carefully and immediately placed into 3-mil plastic bags. All water and mold-contaminated building materials removed from the work area can be transported directly to a trash receptacle located outside of the residence. All damaged building materials can be disposed of as normal solid construction waste. Remove the non-salvageable building materials 12-18 inches past the mold colonization.

- Air Handler Closet: Clean the closet drywall with a HEPA vacuum and then a mild detergent (and water) or appropriate anti-microbial solution. After it dries, apply a stain-blocker primer and latex paint with a mold-inhibitor additive. Remove and replace the drywall that is unable to be cleaned.

- Supply Vents: The supply vents should be removed and cleaned with a mild detergent (and water) or appropriate anti-microbial solution. While removed the underlying ceiling drywall should be inspected for underlying superficial mold growth. If mold growth is encountered, HEPA vacuum the ceiling drywall then clean the area with a mild detergent (and water) or appropriate anti-microbial solution. After it dries, apply a stain-blocker primer and latex paint with a mold-inhibitor additive. Replace any ceiling drywall unable to be cleaned.

- Inspect the inside of the wall and/or ceiling cavities around the remediated areas for any further mold colonization. If additional mold growth is found, remove and/or clean the affected building materials as necessary.

- Clean all building material debris from the work area. Use a minimal amount of water in the cleaning process.

**Occupancy During Remediation**

The residence can be occupied by the homeowners during remediation activities.

**Environmental Monitoring**

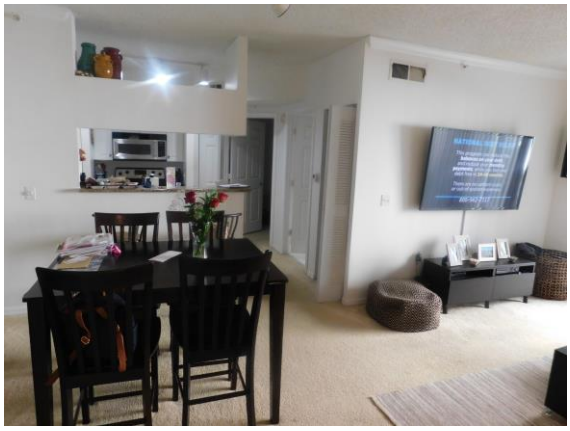
Monitoring can be conducted by request in all work areas where decontamination activities take place. Items that may be monitored include on-going measurements of temperature and relative humidity, air pressure differentials between work areas and adjacent areas, moisture content in building materials and airborne and settled mold spores.

**Cleaning and Decontamination Procedures and Requirements**

Refer to the IICRC-S520 Standard and Reference Guide for Professional Mold Remediation for all procedures and requirements. In case of a conflict between the AirSpec protocol and the IICRC S-520, call AirSpec for consultation.

# 6
# Supporting Data

## A. Findings and Photographs

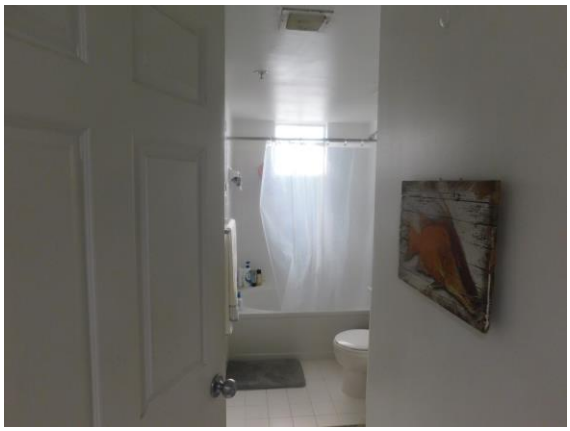



Left and Right Pictures: These pictures show a view of the living room and dining room with superficial mold growth on the supply vent.

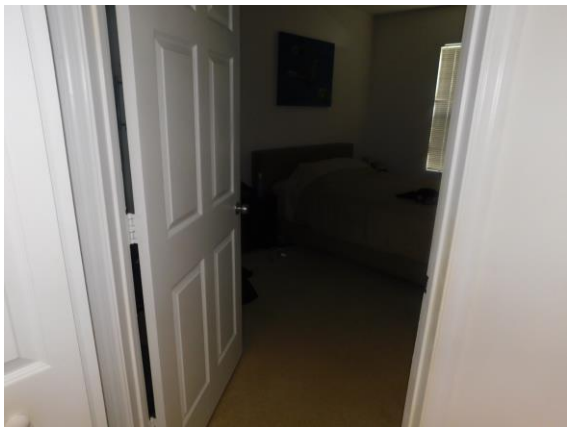
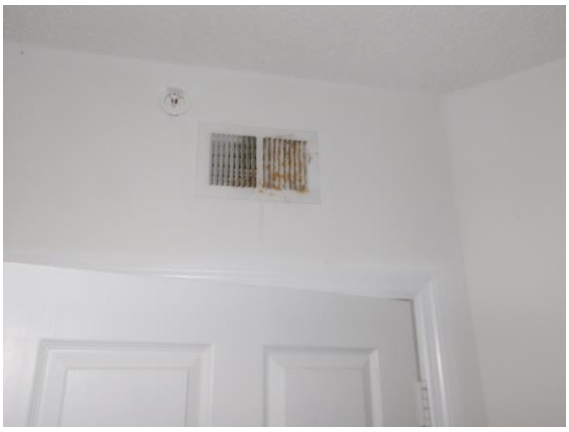

Left Picture: This picture shows the AHU. Right Picture: This picture shows seam tape deficiencies and holes in the supply ductwork and superficial mold growth on AHU closet drywall.


Left and Right Pictures: These pictures show additional superficial mold growth on AHU closet drywall.

Left Picture: This picture shows the kitchen. Right Picture: This picture shows superficial mold growth on kitchen supply vent.




Left Picture: This picture shows the bathroom. Right Picture: This picture shows superficial mold growth and oxidation on the bathroom supply vent.

Left Picture: This picture shows the bedroom. Right Picture: This picture shows superficial mold growth and oxidation on bedroom supply vent.

## B. Mold Spore Sampling

AirSpec did not collect mold spore air or settlement surface samples (IICRC Condition 2) inside this residence because there was less than 10 square feet of mold growth. When there is less than 10 square feet of mold growth inside a residence, a mold remediation project does not require compliance with the Florida Mold Law. Accordingly, this particular project is considered a maintenance activity.

### Mold Spore Surface Sampling

The Institute of Inspection Cleaning and Restoration Certification (IICRC) developed the IICRC S520 Standard and Reference Guide for Professional Mold Remediation. The S520 standard is a procedural standard and is based on reliable remediation principles, available scientific and industry literature and information, and practical experience.

The IICRC S520 has categorized the indoor environment into three possible conditions when considering the level of mold spore contamination.

Condition 1: An indoor environment that may have settled spores, mold spore fragments or traces of actual growth whose identity, location, and quantity, are reflective of a normal mold spore ecology for a similar indoor environment.

Condition 2: An indoor environment that is primarily contaminated with settled spores that were dispersed directly, or indirectly, from a condition 3 area and which may have traces of actual growth.

Condition 3: An indoor environment contaminated with the presence of actual mold growth and associated spores. Actual growth includes growth that is active or dormant, visible or hidden.

## Condition 3 Environment

Condition 3 surface sampling is a sampling method to prove the existence of Condition 3 mold growth. During certain instances, visual verification of mold colonization is not sufficient and direct sampling of the mold contaminated surface is necessary. Surface sampling is conducted by pressing a prepared tape lift onto the mold contaminated surface. The tape lift is then immediately applied to a clean microscope slide and then sent to INX Laboratories for laboratory analysis.

According to an article published by Geoffrey Clark, MS, CIH, ROH in the *The Synergist,* American Industrial Hygiene Association, 2001, updated 2003, and Goddish 2001, to confirm mold growth on household surfaces, surface mold spore counts must exceed 1,500 spores/$cm^2$.

Surface Sample 181127I006

Location: HVAC Closet Drywall

Observation: This location was chosen because of suspect visible mold growth on the surface.

Interpretation of sample result: Confirms Aspergillus/Penicillium spp. mold colonization.

Surface Sample 181127I007

Location: Kitchen Supply Vent

Observation: This location was chosen because of suspect visible mold growth on the surface.

Interpretation of sample result: Confirms Aspergillus/Penicillium spp. mold colonization.

Surface Sample 181127I008

Location: Bath Supply Vent

Observation: This location was chosen because of suspect visible mold growth on the surface.

Interpretation of sample result: Confirms Aspergillus/Penicillium and Cladosporium spp. mold colonization.

Based on the surface sample results, mold colonization has occurred on the sampled surfaces. Remediation of the Condition 3 mold-contaminated building materials is required in order to return the work area to a Condition 1 environment.

**C. Affected Areas**

Approximately 4-6 square feet of superficial mold growth was localized to the HVAC closet drywall. In addition, all of the supply vents contained superficial mold growth and there is a potential to uncover an additional cumulative 1-2 square feet of superficial/colonized mold growth during the remediation process.

## 7
## Limitations

This assessment was conducted following standard practices and guidelines. Regardless of the thoroughness, it is possible that some areas containing visible mold growth, water damage, and/or elevated moisture content or other indicators of poor indoor air quality were inaccessible or not evident during the assessment.

The findings and recommendations included represent conditions evident at the time of the assessment. Building conditions related to indoor air quality, microbial growth and moisture intrusion may be subject to change on a daily basis, particularly after catastrophic events. Therefore, the conditions observed and reported herein may not be evident in the future. If additional information becomes available which may affect AirSpec's findings and recommendations, we request the opportunity to evaluate the information and modify our findings and recommendations as appropriate.

AirSpec assumes no liability for existing conditions or damage within the subject residence or for any consequential effects that may result from our services and collection of field

samples. Mold spore growth or moisture may exist in areas within the residence that were not accessible or not explored as part of the requested evaluation.

AirSpec assumes no liability for any perceived or documented health effects of the occupants, visitors, contractors, or any other individual that has or may come in contact with the residence that may be attributed to the microbial conditions present within the residence. The Centers for Disease Control and Prevention recommends that individuals who believe that they are ill because of exposure to mold in a building consult a physician. Nothing in this report should be construed as medical advice.

AirSpec has endeavored to meet what it believes is the applicable standard of care ordinarily exercised by others in conducting this assessment. No other warranty, express or implied, is made regarding the information contained in this report.

This report has been prepared for the sole and exclusive use of the client subject to previously agreed-upon terms and conditions. This report may not be suitable for the needs of others. Therefore, any reliance by other parties on the contents of this report is not granted and any such reliance shall be at the sole risk of the user.

# 8
# Laboratory Sample Analysis Results
## Surface Samples:

614 East Hwy 50, #348, Clermont, FL 34711
Phone (352) 429-3181
www.inxlabs.com leigh@inxlabs.com

MICROBIAL | INDOOR AIR QUALITY | ENVIRONMENTAL

EMPAT #151568 | ASM #55176465 | USEPA #FL01213

| | | | |
|---|---|---|---|
| **Name:** | Air Spec | **Sample Collected:** | 11/23/2018 |
| | 1310 North Shore Drive | **Sample Received:** | 11/27/2018 |
| | Leesburg, FL 34784 | **Reported:** | 11/27/2018 |
| | | **Method:** | Direct Microscopy |
| **BY:** | Mark Levy | **Sample Type:** | Pre |
| | | **Batch:** | 20384 |
| **Project:** | ML18111215 | **Magnification:** | 600X |

### Direct (Quantitative) Analysis

| **Lab ID Number:** | **181127I006** | **Sample Location:** | **HVAC Closet Drywall** |
|---|---|---|---|
| **Spores Identified** | | **Count/cm2** | |
| Aspergillus/Penicillium | | 1,411,314 | |
| Hyphae fragments | | 166 | |
| **Total** | | **1,411,480** | |
| | | Debris 1+ | |

| **Lab ID Number:** | **181127I007** | **Sample Location:** | **Kitchen Supply Vent** |
|---|---|---|---|
| **Spores Identified** | | **Count/cm2** | |
| Aspergillus/Penicillium | | 1,692,972 | |
| Hyphae fragments | | 148 | |
| **Total** | | **1,693,120** | |
| | | Debris 1+ | |

| **Lab ID Number:** | **181127I008** | **Sample Location:** | **Bath Supply Vent** |
|---|---|---|---|
| **Spores Identified** | | **Count/cm2** | |
| Aspergillus/Penicillium | | 6,863 | |
| Cladosporium spp. | | 274,536 | |
| **Total** | | **281,399** | |
| | | Debris 2+ | |

**Level of Debris**
**0 = No Debris**
**1+ = Slight Debris**
**2+ = Light Debris**
**3+ = Moderate Debris**
**4+ = Heavy Debris**

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*Approved by* _____

*Leigh Dundore, Lab Director*

# 9
# Further Information and References

## A) Moisture and Mold Prevention Tips

After the remediation and reconstruction is completed, facility mangers and homeowners must commit to a mold-free environment by taking the necessary steps to prevent a recurrence mold contamination. Integrate the following practices into your building management plan or home maintenance practices.

- Moisture control is the key to mold control. When water leaks or spills occur indoors - ACT QUICKLY. If wet or damp materials or areas are dried 24-48 hours after a leak or spill happens, in most cases mold will not grow.
- Maintain all painted surfaces on exterior wood surfaces.
- Clean and repair roof gutters regularly.
- Make sure the ground slopes away from the building foundation, so that water does not enter or collect around the foundation.
- Keep air-conditioning drip pans clean and the drain lines unobstructed and flowing properly.
- Keep indoor humidity low. If possible, keep indoor humidity below 60 percent (ideally between 30 and 50 percent) relative humidity. Relative humidity can be measured with a moisture or humidity meter, a small, inexpensive instrument available at many hardware stores.
- Do not carpet bathrooms and utility rooms. Remove and replace flooded carpets.
- Strive for positive building pressure to reduce infiltration of humid, hot air.
- Avoid impermeable vinyl or other impermeable coverings on the interior building surfaces.
- Install vapor barriers based on climate.

<u>Actions that will help to reduce relative humidity:</u>

- Vent appliances that produce moisture, such as clothes dryers, stoves, and kerosene heaters to the outside where possible. (Combustion appliances such as stoves and kerosene heaters produce water vapor and will increase the humidity unless vented to the outside.)
- Use air conditioners and/or de-humidifiers.
- Run the bathroom fan or open the window when showering. Use exhaust fans or open windows whenever cooking, running the dishwasher or dishwashing, etc.

If you see condensation or moisture collecting on windows, walls or pipes ACT QUICKLY to dry the wet surface and reduce the moisture/water source. Condensation can be a sign of high humidity.

<u>Actions that will help prevent condensation:</u>

- Reduce the humidity (see above).

- Increase ventilation or air movement by opening doors and/or windows, during low humidity months. Use fans as needed.
- Cover cold surfaces, such as cold-water pipes, with insulation.
- Increase air temperature.
- Install a humidity control device on the HVAC unit

**B) References**

The following publications may have been used for guidance in conducting this mold assessment.


1. IICRC S520: Standard and Reference Guide for Professional Mold Remediation 2nd Edition. Institution of Inspection, Cleaning and Restoration Certification. Vancouver, WA. 2008

2. IICRC S500: Standard and Reference Guide for Professional Water Damage Restoration 3rd Edition. Institution of Inspection, Cleaning and Restoration Certification. Vancouver, WA. 2006

3. Recognition, Evaluation and Control of Indoor Mold. American Industrial Hygiene Association. Fairfax, Va. 2008

4. Fungal Contamination: A Manual for Investigation, Remediation and Control. Hollace S. Bailey, PE, CIAQP, CIE, CMR. Building Environment Consultants, Inc. Jupiter, FL. 2005

5. Bioaerosols: Assessment and Control. Janet Macher, ScD., M.P.H. American Conference of Governmental Industrial Hygienists, Cincinnati, OH. 1999

6. Worldwide Exposure Standards for Mold and Bacteria. 7th Edition. Robert C. Brandys, PhD, MPH, PE, CIH, CSP, CMR and Gail M. Brandys, MS, CSP, CMR, CIEC. OEHCS Publications. Hinsdale, IL. 2003

7. Post-Remediation Verification and Clearance Testing for Mold and Bacteria - Risk Based Levels of Cleanliness Assurance 1st Edition. Robert C. Brandys, PhD, MPH, PE, CIH, CSP, CMR and Gail M. Brandys, MS, CSP, CMR, CIEC. OEHCS Publications. Hinsdale, IL. 2003

8. ASTM D7338: Standard Guide for Assessment of Fungal Growth in Buildings. ASTM International 2014.

## *About AirSpec….*

AirSpec, Inc. was formed in 2002 in order to provide homeowners, mold remediators, and homeowners insurance carriers expert advice on proper and prudent procedures to be accomplished during the mold remediation process. The owner of AirSpec is a Certified Industrial Hygienist (CIH) and a Florida licensed residential contractor who has been employed by the US Air Force, California Compensation (workers comp insurance carrier), Kennedy Space Center, Department of Energy (DOE) and General Physics Corporation.

During our early years as an indoor air quality consulting company, AirSpec had two large residential developers who utilized our services for mold remediation. AirSpec also provided construction remodeling services which may have included mold remediation. Our scientific background, combined with our mold remediation and construction experience, has provided us with invaluable insight into the mold remediation process.

We pride ourselves in providing thorough unbiased mold assessments, detailed mold remediation protocols, and a quick report turnaround.

All of AirSpec's mold assessors have at least a bachelor's degree in science, receive thorough on-the-job and classroom training, are licensed mold assessors and/or working under the direct supervision of a licensed mold assessor. We have Certified Industrial Hygienists (CIH) and Licensed Professional Engineers (PE) on staff.

The following is a brief listing of our services:

- Cause and Origin investigations for water infiltration and/or mold growth
- Mold Assessments and/or Mold Remediation Protocols
- Post-Mold Remediation Inspections
- Roof Storm Damage Assessments (Professional Engineer on staff)
- Indoor Air Quality Investigations to determine the cause of indoor illness
- Post Water Infiltration Assessments to verify or deny mold growth
- Investigations to discover structural water leaks
- Mold spore sampling (air, tape lifts, or swabs)
- Clandestine Drug Lab (Meth Lab) verification, cleaning protocols, and post-remediation inspections
- OSHA compliance solutions
- Industrial Hygiene and Safety Consulting
- LEED Consulting
- Expert Witness Testimony/Services

AirSpec and all employees are bound by The American Board of Industrial Hygiene (abih.org) code of ethics. These canons provide standards of ethical conduct for industrial hygienists as they practice their profession and exercise their primary mission: to protect the health and well-being of working people and the public from chemical, microbiological, and physical health hazards.