Certified member
Chartered Institute of Environmental Health

We provide the best technology & to assist you and the healthcare professional.

Building Forensics Ltd

Example Building Investigation Report

Note:

- Sections 1 to 6 are the basic report and sampling locations
- Section 7 is advised with the report to assess your mould risks
- Sections 8-9-10-11-12-13 are sometimes advised depending on health concerns and your budget
- Section 14: Conclusions
- Section 15 Recommendations

Please note

These sections are optional and may only be recommended if you have specific health concerns or your healthcare professional recommends them

We provide free guidance notes on all aspects of sampling and analysis, and will discuss your specific needs if you would like to book a call.

Executive Summary

The inspection has revealed high levels of hidden mould and airborne mould spores (genus). The symptoms you have alerted us to are likely the result of an inflammatory response from a toxigenic species, which are confirmed to be present. The analysis in section 9 confirms the presence of Mycotoxin triggers, which are also confirmed in your urine tests. The building is wet and requires professional drying. The mycotoxins identified in your medical tests are now confirmed to be present in your home.

We can provide solutions and remediation if requested.

Survey Author **Jeff Charlton MCIEH CIEC- CR-WLS-CMH-Hon Fellow BDMA**

Report on Building-Related Health Issues

Section 1 - Preamble

This report is based on the information you provided, an inspection of your property, and analysis and measurements taken.

No inspection can be 100% reliable, but intrusive inspection and multiple testing protocols can obtain greater accuracy. The extent and accuracy of any survey are always limited to your budget and reflect the type and number of samples taken and analysed. Any recommendations or conclusions we make must be substantiated before action.

Building-related illnesses can be challenging to treat if contamination persists. Health improvements are unlikely if exposure to inflammatory triggers exceeds the treatment benefits.

This survey may be a crucial first step in treatment. Its conclusions should be shared with your healthcare professional, and recommendations should be followed immediately.

Where biological growth has occurred, whether bacteria or mould, alive or dead, and indeed fragments, it remains a health hazard. Chemical mycotoxins and/or allergens may cause an inflammatory response decades after the initial incident. Dried fragments may be 40 times more hazardous (ref WHO) than viable growth, so even areas dried from historic water damage events may be a health risk and impossible to assess without further intrusive investigation or risk assessment.

Section 2 – Limitations of the Report

It should be recognised that any report can be criticised for not doing enough or for noncompliance with recognised standards. Building Forensics balances cost and required results and endeavours to provide practical and economic investigation results.

Building Forensics use recognised standards in their investigations but invariably compares target areas against unaffected regions. This can include moisture levels in air and substrates, and/or chemicals and biological activity.

Report Conclusions may indicate the presence of elevated or abnormal contamination. Generally, there is no standard for a regular or healthy home or property, and any conclusions or recommendations are based on a comparison of unaffected areas or the Building Forensics opinion.

It is, therefore, essential to recognise basic risk and hazard protocols where or if hazards and exposure routes may exist. While some moulds are considered toxigenic,

risks from allergens can create harmful synergistic effects greater than their components.

Assessments are based on probability and usually recognise the most harmful substance as the leading agent. (by CoSHH)

The bottom line is that occupant health and personal evidence of building-related illness trumps all scientific risk and hazard assessments, and our role is to support the client or patient with measurable evidence or considered sources.

Section 3 - Building Forensics Building Survey (Survey 1)

The basic survey aims to assess current and historical water damage or contamination issues, focusing on identifying possible evidence of causation. The investigation evaluated possible building construction and design defects, alterations to the building envelope and lifestyle and ventilation issues. The report culminates in conclusions and recommendations.

The report's basis is the formation of an investigation and testing of a hypothesis, which will be tested using the information provided, visual inspection, measurement, and laboratory analysis. The report emphasises building-related illnesses and the causes or likelihood of possible contamination and moisture issues. This report is not intended to be a building survey, which a RICS surveyor would generally undertake. An RICS surveyor will not typically conduct a mould or environmental survey.

This survey and inspection assess and measure areas of concern. Hidden, camouflaged, or dry areas, typically in cavities or redecorated, may not be found; however, biological sampling may identify areas of concern. Of course, this is limited to the constraints of the basic report and sampling frequency. Intrusive investigation into cavities may be required, but it is not a part of this basic investigation.

1. Report basis and considerations

1.1. Scope or Investigation Parameters

1.1.1. To assess the potential for building-related illness

1.1.2. Informed Facts –

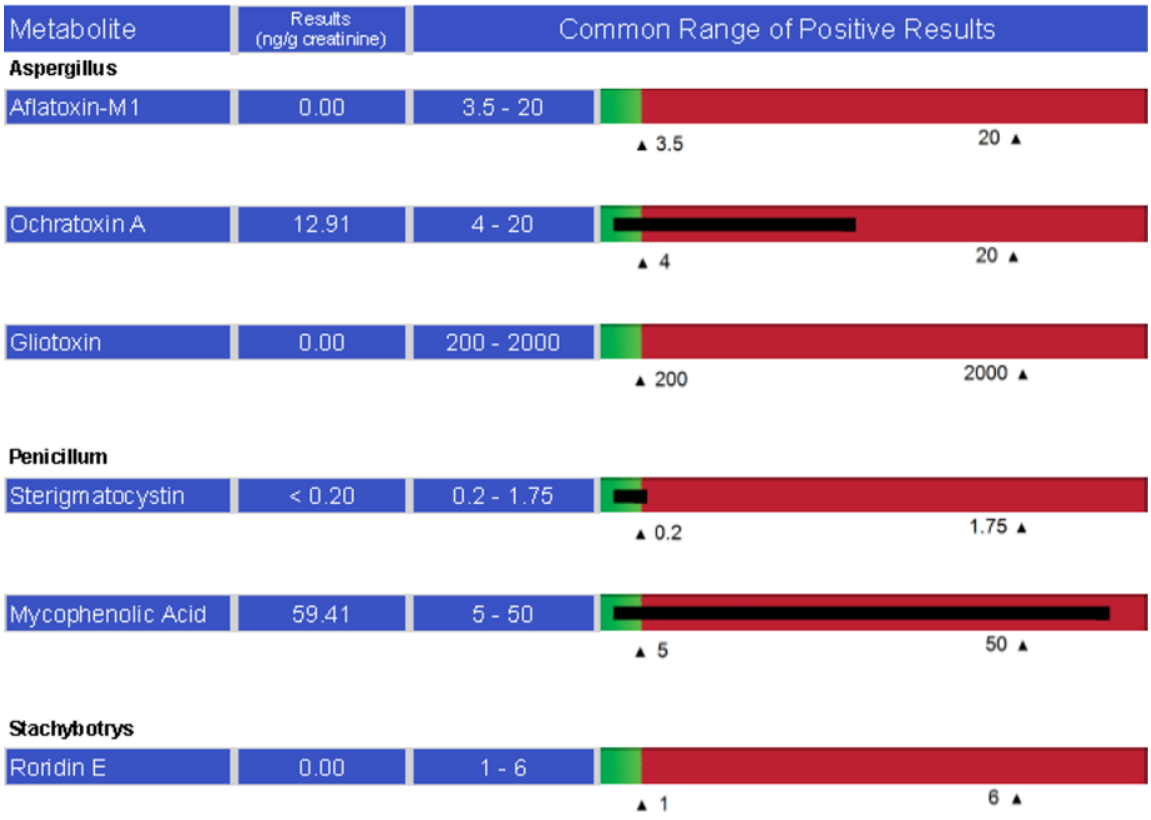
Occupants may be suffering from a building-related illness.

The client's healthcare professional provided the following urine mycotoxin report, which indicated specific health concerns.

From our introductory survey, we identified areas to test for mycotoxins in the urine analysis.

We also identified the toxigenic species of mould likely to produce them and, most importantly, the causation. In some cases, decontamination and risk reduction are essential for treatment to be successful. **See section 14**

MycoTox Profile



OCHRATOXIN A (OTA)

Ochratoxin A (OTA) is a nephrotoxic, immunotoxic, and carcinogenic mycotoxin produced by moulds in the Aspergillus and Penicillium families. Exposure is primarily through inhalation in water-damaged buildings.

STERIGMATOCYSTIN (STG)

Sterigmatocystin (STG) is a mycotoxin closely related to aflatoxin. It is produced from several species of mould, such as Aspergillus, Penicillium, and Bipolaris. STG is considered carcinogenic, particularly in the cells of the GI tract and liver. STG has been found in the dust from damp carpets.

MYCOPHENOLIC ACID*

The Penicillium fungus produces Mycophenolic Acid (MPA), an immunosuppressant that inhibits the proliferation of B and T lymphocytes. MPA exposure can increase the risk of opportunistic infections such as Clostridia and Candida. When a woman is exposed to MPA during pregnancy, she is also at risk of miscarriage and congenital malformations.

Mould growth on the internal filter of the dehumidifier

Visible presumed mould and water staining

1.2. Building Type

1.2.1. Solid walls and tile

1.2.2. Concrete Floor

1.3. Visible and olfactory issues

1.3.1. No Damp Proof Course
1.3.2. No Air bricks
1.3.3. No Roof Vents
1.3.4. No Soffit vents
1.3.5. No ventilation
1.3.6. No trickle vents
1.3.7. Dead wood (mould) stored in the lounge
1.3.8. Decaying carpet
1.3.9. Visible mould on carpet
1.3.10. Visible mould specks on walls
1.3.11. Decaying window frames
1.3.12. A gas heater produces large quantities of moisture

Decaying carpet

No soffit vents and issues with loft ventilation

2. Dust monitoring

2.1.1. The airborne dust concentration is measured in g/m³ or particles defined in ppm, with sizes ranging from 0.1 microns to 10 microns. Typical equipment used is the 6-channel laser particle counter.

2.1.2. Fragments of mould are often in the 2.5-micron range, although spores are invariably more than 10 microns.

2.1.3. Particle counts are taken to assist in the development of the sampling hypothesis. The higher particle counts in association with size provide us with one indicator of possible contamination sources, and this may be where samples are taken.

2.1.4. The results are shown in Table 1 below

Table 1

AREA	Particle Size µ	.3	.5	1.0	2.5	5.0	10
Ambient		16255	6793	1329	217	25	13
Main bedroom		116106	33871	4135	636	99	53
Shower		191649	54628	7869	1121	183	75
Single bedroom		209502	62960	9012	1153	161	85
Kitchen		244872	77360	11163	1444	184	92
Hallway		217447	65223	9033	1203	172	73
Lounge Piano end		294233	103434	13935	1668	256	106
Lounge Table		297677	102064	14516	1612	247	93

2.2. Conclusions of particles

2.2.1. Elevated particle counts may sometimes be assumed to be sources of contamination

2.2.2. The highlighted readings above are elevated compared to ambient air and comparison areas

2.2.3. The colour-coded table is the author's subjective opinion and has no scientific value.

2.2.4. The air is highly contaminated, and although the content of the particulates is unknown, these are incredibly high and in my opinion a significant risk

2.3. Photographic log

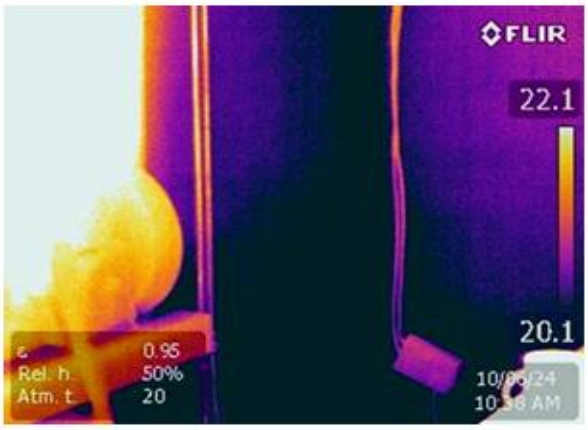
Particle counts

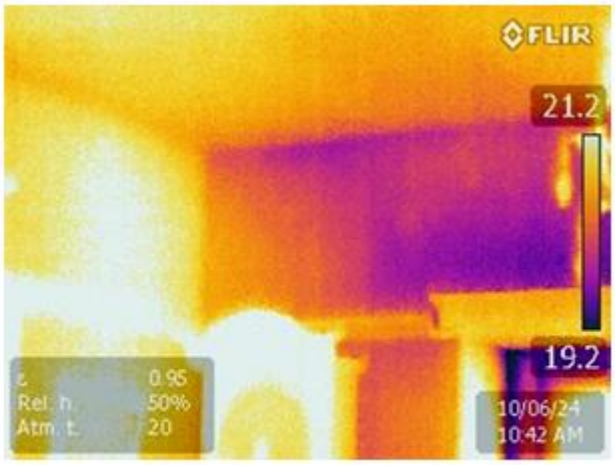
3. Thermal imaging survey

3.1. A thermal imaging camera was used to scan the building envelope and substrates to assess temperature differentials known as ΔT. These scans may identify thermal bridging and poor insulation, which can lead to dew point condensation, indicating that further investigation is required to assess possible leaks, penetrating damp, or wet materials or insulation.

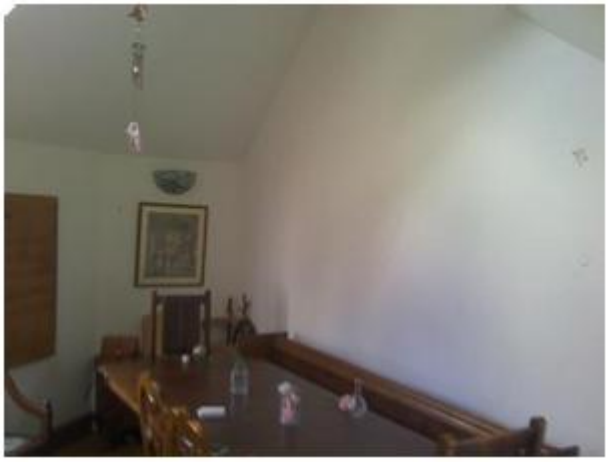
3.2. This survey often forms the basis of the moisture mapping, but darker doesn't necessarily mean the substrate is wet; it can be cold. Darker areas in the photos can indicate cooler areas, and this may be associated with differing or missing insulation levels, dampness, air leaks, etc

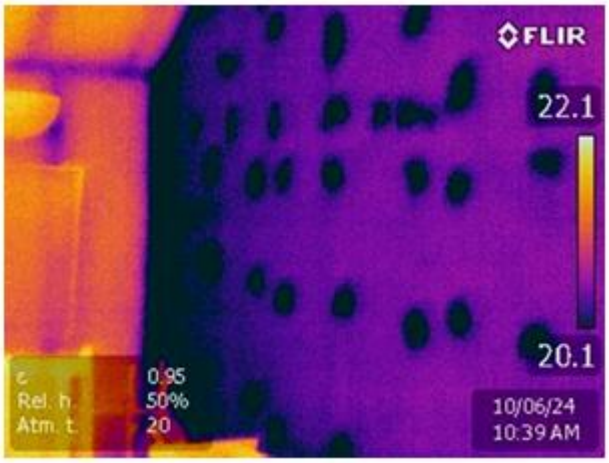
4. The ceiling and adjacent external walls may have condensation issues

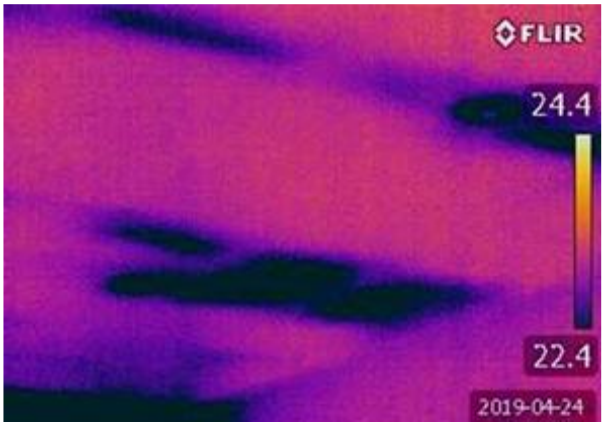




Ceiling and wall area in lounge affected by active leak from wet room leak







5. Moisture mapping

5.1.1. The moisture content of various targeted substrates is measured using moisture meters calibrated for the specific material, either with impedance (non-penetrative) or conductive pin meters.

5.1.2. The objective here is to assess moisture issues which may be responsible for current biological amplification. Although areas may appear dry, previous moisture may have caused hidden biological growth, which can remain allergenic or irritating until removed.

5.1.3. Inflammagens in cavities can be expected to leak out into the occupied spaces.

5.1.4. Measurement is assessed against recognised standards or the equilibrium of unaffected areas.

5.1.5. Equilibrium, for this purpose, is the expected homogeneous level of moisture in the same material. Where concerns are present, penetrative measurement may be required.

5.1.6. Materials DO NOT have to be wet or saturated for mould growth, and a boundary layer of a few molecules of moisture can exist on top of materials, which is conducive to mould growth. Mould does not grow in wet conditions and prefers damp.

5.1.7. Mould growth on window glass and refrigerator linings is a typical example. Although the material is non-porous, cold, and internally dry, growth still occurs on the surface. In this case, a biofilm is often the cause.

5.1.8. Although some materials may be dry, we also look for historically wet areas, and it must be recognised that any water damage will result in mould or bacterial amplification within 48 hours.

5.1.9. Biological growth (including mould) prefers damp, dark, warm areas away from UV light and air movement. Ideal growth conditions are found in the ceiling, wall and floor cavities. We may make risk assessments in the absence of complex data.

5.2. Standards of dry

5.2.1. The tables below show typical limits regarding the moisture content of various materials. Taken from British Standards PAS 64, also follows BS8201 and ASTM F2710. Further information is available in the appendix

Structural material	MC	WME%	ERH
Wood	**16**	**16**	**N/A**
Drywall (plasterboard)	**3.0**	**12**	**N/A**
Plaster	**0.3**	**15**	**N/A**
Brick	**1.5**	**15**	**75**
Concrete	**3.5**	**15**	**75**
Sand cement screed	**6.0**	**15**	**75**

The floor's moisture content is 5.5, with 4.5 being an action point. This concrete floor is confirmed to be wet and may be a significant source of elevated humidity throughout the house.

A nondestructive impedance measurement of the plasterboard behind the tiles showed that water had penetrated the grouting to wet the plasterboard, resulting in hidden mould growth in the wall cavity between the shower and bedroom.

Wet plasterboard wall at 22%wme , with 12% being a trigger point for action

Infrared scanning identified possible moisture at room edges. The conductive moisture probe confirmed the floor is wet at 36% and well above the accepted 20% trigger for mould

Comparison levels indicating lower moisture issues

Comparison levels indicating lower moisture issues with the likelihood of mould in the cavity

Concrete floors wet
Calibrated concrete meters are a good indicator of moisture problems, and readings should be below 4
This may attract an additional charge

Area	Type of test	Reading	Concern
Lounge	Calcium Carbide	5.5	Wet *
Kitchen	Sleeve	80%	Wet

Note

These are standards, but interpretation may be required, particularly where historic water damage is present. A significant risk is where water damage in high cellulose materials has been allowed to dry naturally.
Measuring concrete, floor slabs, and screeds requires a specific and detailed investigation according to international standards.

The measurement of concrete and screed must follow a recognised protocol, which may require consideration of certain environmental factors and monitoring over 48 hours. Building Forensics will adopt an investigative approach to a lesser degree for simplicity and to contain costs. Where certified evidence is required, a separate instruction will be required.

6. Humidity ratio, also known as Specific Humidity

6.1. This is a function of relative humidity and temperature and calculates the quantity (weight) of moisture carried in the air based on g/kg of dry air. Variations between rooms and ambient conditions can indicate local moisture issues. A Thermo hygrometer with the probe is used to calculate the humidity ratio. Uncontrolled evaporation will result in moisture adsorbing into porous hydrophilic materials, possibly resulting in biological growth. Even nonporous materials can be affected by high humidity ratios, especially from the dew point condensation. The following readings with decimal points are taken directly from the meter.

Area	Temp C	RH	Humidity Ratio
Ambient	**17.4**	**49.7**	**6.1**
Main bedroom	**18.8**	**67.7**	**9.1**
Shower	**18.7**	**69.8**	**9.4**
Single bed	**18.2**	**68.3**	**8.9**
Kitchen	**19.6**	**64.7**	**9.2**
Lounge	**17.6**	**68.5**	**8.6**

All reasonable levels

6.2. Conclusions

6.2.1. The table below shows that the property has a slightly higher specific humidity compared to ambient air, but acceptable levels

6.2.2. Elevated specific humidity may be caused by lifestyle and poor ventilation. Typically, a family of four may produce 15 litres of moisture in the air per day from breathing, cooking, showers, etc.

6.2.3. Drying wet clothes inside, not using cooking or bathroom exhausts, can add to this moisture loading

6.3. Dew Point Condensation

6.3.1. Dew point is the temperature at which warm air holding moisture condenses on colder surfaces, leaving droplets and can result in mould growth. Dew point is measured by taking the temperature of surfaces, usually external walls

6.3.2. External walls measured show temperatures 3 -4 degrees above dew point, condensation risk

6.3.3. Photo Log

Wall temperatures are generally 15.5, and the dew point is around 12 °c

6.4. Conclusion **Low dewpoint risk**

End the basic survey and start additional sampling and analysis.
Please note that we will advise and guide you to the most appropriate sampling and analysis to suit your needs and budget.

Note
While the following Total Spore Count analysis in section 7 is in addition to the preceding basic survey, we always recommend this analysis as a guide to your exposure to mould.

7. Total Spore Counts Risk Assessment

7.1. This survey has been developed from our experience of building-related illness and the confirmation of risks identified in the basic study 1

7.2. In this sampling protocol, we collect airborne spores in purpose-made, sealed cassettes for laboratory analysis by qualified mycologists. The results are compared to other areas and outside (ambient) air as a control. This type of sampling identifies the mould genus but not the species. However, the levels are an indicator of risk areas.

Sample Number	Area collected
1	**Bed**
2	**Table**
3	**Ambient**
4	**Piano**

7.3. Note

7.3.1. Mycologists cannot distinguish between Penicillium and Aspergillus. Therefore, reports are stated as Penicillium/Aspergillus, and the report is deemed a risk assessment regarding counts and types of mould.
It is essential to understand that all forms of sampling and analysis have benefits and shortfalls. While this provides a risk assessment of spore counts, it cannot distinguish species or hyphal fragments.

7.4. Lab result factors

7.4.1. The following tables are total spore counts (viable dormant and non-viable)

7.4.2. The individual samples should be compared to other areas and the outside (ambient sample)

7.4.3. The results may be influenced by debris loading and other factors, and these findings are an integral part of the methodology. Debris loading is dust, including skin, dust mite faeces, dander and general fluff/dirt. The level of dust can obliterate the visual detection of spores when viewed under a microscope.

7.4.4. Debris loading is generally rated between 1 and 5, with 5 being dirty air.

7.4.5. A simplistic explanation is to consider a plate of peanuts with 1-2 -3 -4 -5 bags of flour dropped on top and see if you can count the peanuts through the flour.

7.4.6. The reality is, the dirtier the air, the more the mycologist relies on periphery counts, and this always leads to underestimation

7.5. **The lab report identifies the percentage of count and the total spore count**

The standard report displays a column indicating the percentage of sample fields that have been read. This means that the number of spores counted for each spore type is represented by a certain percentage of fields on which they were observed, not the percentage of the total sample.

7.6. **Reporting Limits**

The Reporting Limit for a spore type uses the formula listed in the section above and assumes that the lowest raw count that can be detected is one.

7.7. Lab analysis

7.7.1. The ambient outside conditions should be compared to inside genus and spore counts (levels), including the percentage identified in the analysis. Our reports provide risk factors from the data collected.

7.7.2. Note the high debris loading both inside and outside the property, which may occlude visible identification; therefore, spore counts can be assumed to be higher (see note above, Table 42)

7.7.3. Comparison between different locations should also be considered.

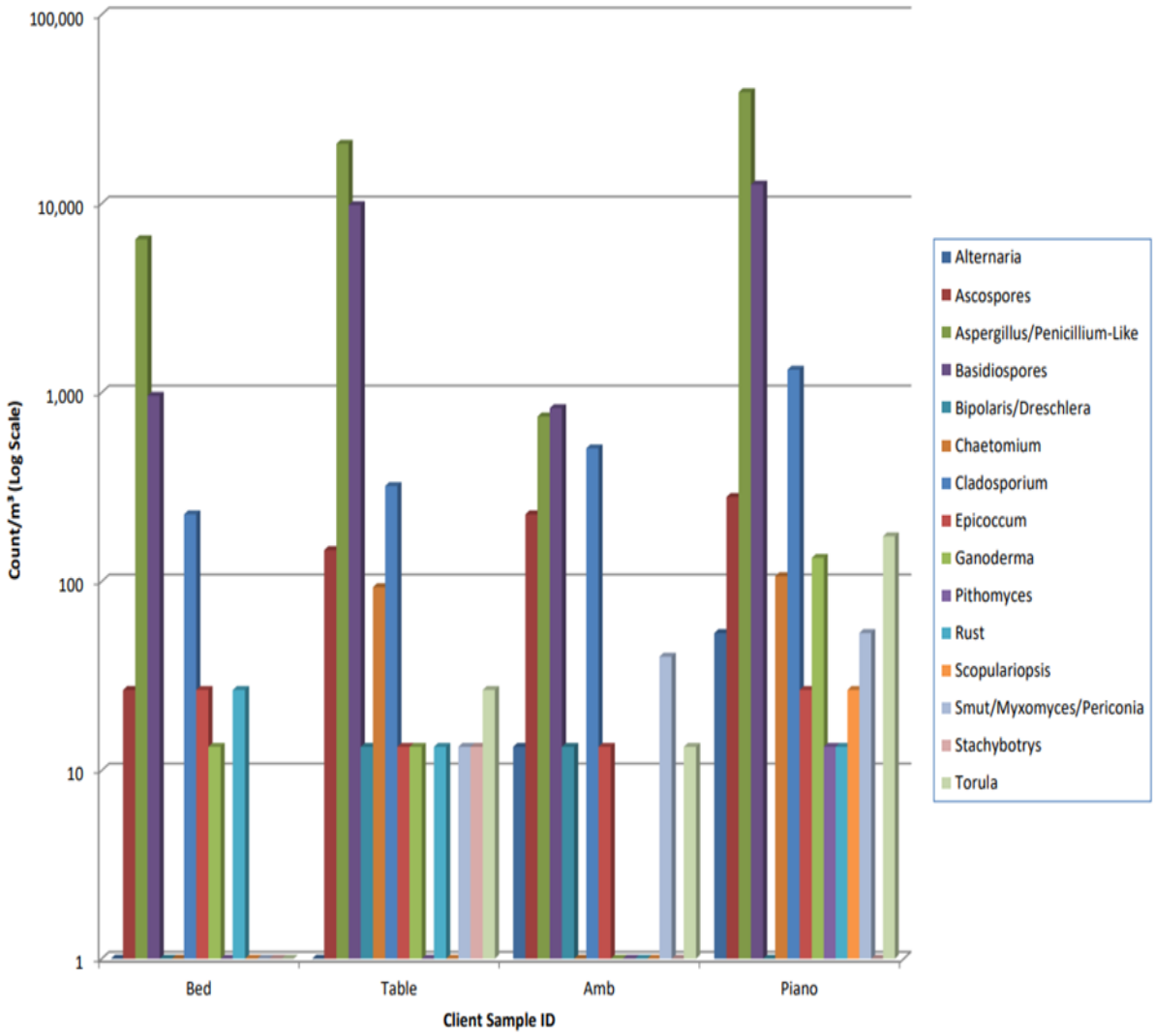
7.7.4. The spore counts are extremely high

7.7.5. The lounge is grossly contaminated, but the bedroom is also bad

7.7.6. These identified genera may be considered toxigenic due to levels and environment

7.8. MOST IMPORTANT INFORMATION

The AMB or ambient (outside) count of Aspergillus and Penicillium is essential, as it shows 747 spores per cubic meter of air against the inside property, showing thousands of the same genus. Do not be concerned about the data gathered; we will interpret it.


100,000
10,000
1,000
100
10
1
Count/m³ (Log Scale)
Bed
Table
Amb
Piano
Client Sample ID
Alternaria
Ascospores
Aspergillus/Penicillium-Like
Basidiospores
Bipolaris/Dreschlera
Chaetomium
Cladosporium
Epicoccum
Ganoderma
Pithomyces
Rust
Scopulariopsis
Smut/Myxomyces/Periconia
Stachybotrys
Torula

Sample ID:	504964-01	504964-02	504964-03	504964-04
Client Sample ID:	Bed	Table	Amb	Piano
Volume Sampled (L):	75	75	75	75
Media:	Air-O-Cell	Air-O-Cell	Air-O-Cell	Air-O-Cell
Percent of Trace Analyzed:	100% at 600X Magnification	100% at 600X Magnification	100% at 600X Magnification	100% at 600X Magnification

Spore Types	Raw Count	Count/m³	%	Raw Count	Count/m³	%	Raw Count	Count/m³	%	Raw Count	Count/m³	%
Alternaria	–	–	–	–	–	–	1	13	1	4	53	<1
Arthrinium	–	–	–	–	–	–	–	–	–	–	–	–
Ascospores	2	27	<1	11	147	<1	17	227	9	21	280	1
Aspergillus/Penicillium-Like	485	6,467	83	1,553 #	20,707	66	56	747	31	2,914 #	38,853	72
Basidiospores	72	960	12	735 #	9,800	31	62	827	34	945 #	12,600	23
Bipolaris/Dreschlera	–	–	–	1	13	<1	1	13	1	–	–	–
Botrytis	–	–	–	–	–	–	–	–	–	–	–	–
Chaetomium	–	–	–	7	93	<1	–	–	–	8	107	<1
Cladosporium	17	227	3	24	320	1	38	507	21	99	1,320	2
Curvularia	–	–	–	–	–	–	–	–	–	–	–	–
Epicoccum	2	27	<1	1	13	<1	1	13	1	2	27	<1
Fusarium	–	–	–	–	–	–	–	–	–	–	–	–
Ganoderma	1	13	<1	1	13	<1	–	–	–	10	133	<1
Memnoniella	–	–	–	–	–	–	–	–	–	–	–	–
Nigrospora	–	–	–	–	–	–	–	–	–	–	–	–
Oidium/Peronospora	–	–	–	–	–	–	–	–	–	–	–	–
Pithomyces	–	–	–	–	–	–	–	–	–	1	13	<1
Rust	2	27	<1	1	13	<1	–	–	–	1	13	<1
Scopulariopsis	–	–	–	–	–	–	–	–	–	2	27	<1
Smut/Myxomyces/Periconia	–	–	–	1	13	<1	3	40	2	4	53	<1
Stachybotrys	–	–	–	1	13	<1	–	–	–	–	–	–
Torula	–	–	–	2	27	<1	1	13	1	13	173	<1
Ulocladium	–	–	–	–	–	–	–	–	–	–	–	–
Unidentified Spores	–	–	–	–	–	–	–	–	–	–	–	–
Total Spores	**581**	**7,747**		**2,338**	**31,173**		**180**	**2,400**		**4,024**	**53,653**	
Hyphal Fragments	6	80		31	413		4	53		31	413	
Pollen	5	67		22	293		37	493		24	320	
Debris Rating	3			3			3			3		
Detection Limit	13			13			13			13		

Estimation performed due to high count.

Fungal Glossary

 Typically found growing outdoors

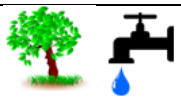
 Considered water damage indicator

 Potential allergen

 Potential to produce mycotoxins

Alternaria	
Description	**Characteristic**
These are a common plant pathogen involved in the decomposition of plants. In the indoor environment they are found growing on a variety of substrates including sheetrock and other building materials. They are common allergens causing hay fever or hypersensitivity reactions.	

Anthrinium	
Description	**Characteristic**
These are a plant pathogen found in soil and decomposing plant material. Not typically found growing indoors. One species has been determined to be an allergen.	

Ascospores	
Description	**Characteristic**
These are a very large group of spores that are found everywhere in nature. They are commonly found outdoors and associated with rain and moisture. Some species grow well indoors on damp materials. Ascospores have allergenic potential, however, it is species dependent.	

Aspergillus/Penicillium – Like	
Description	**Characteristic**
These are two of the most common genera in the world. They can be found everywhere in nature, both indoors and outdoors. Indoors they can be found on water damaged wallpaper, carpet, and other organic materials. They can also grow well in conditions of high humidity. Many species are allergens and a common cause of respiratory irritation. Some species are human and animal pathogens and can cause infection.	

Basidiospores	
Description	**Characteristic**
These are primarily comprised of mushrooms and shelf fungi. They are typically found outdoors. Occasionally they are found indoors growing on any organic matter causing dry rot. Some species can be an allergen to sensitive individuals.	

Bipolaris/Dreschlera	
Description	**Characteristic**
These are a plant pathogen typically found outdoors on grasses, grains, and decaying food. Indoors they can be found on plants and building materials. They are an allergen that can affect the nose, skin, eyes and upper respiratory track.	

Botrylis	
Description	**Characteristic**
These are a plant pathogen typically found growing on vegetation particularly in temperate and subtropical climates. Indoors they can be found growing on plants. They are a potential allergen causing hay fever and asthma effects.	

Chaetomium	
Description	**Characteristic**
These are typically found indoors on water damaged cellulose containing materials such as paper, sheetrock, and wallpaper. Not well studied but possible allergen with hay fever and asthma effects.	

Cladosporium	
Description	**Characteristic**
One of the most common genera in both the indoor and outdoor environments. Indoors they grow well in damp environments and areas where condensation builds. They are often found on textiles, window sills, in bathrooms, and A/C systems. They are a common allergen when airborne.	

Curvularia	
Description	**Characteristic**
Primarily found outdoors on plants and soil especially in subtropical and tropical environments. Indoors they grow on a variety of building materials. They are a common allergen causing hay fever, asthma, and allergic fungal sinusitis.	

Epicoccum	
Description	**Characteristic**
Outdoors they are found in the soil, air, and rotting vegetation. Indoors they grow well on a variety of building materials such as paper and textiles. They are a potential allergen with hay fever, asthma, and skin allergy effects.	

Fusarium	
Description	**Characteristic**

Indoors they are typically found under very wet conditions. Some places they can be found are dust in carpet and mattresses, damp walls, wallpaper, and duct liner. They are a potential allergen causing hay fever and asthma effects.	

Ganoderma	
Description	**Characteristic**
These are shelf mushrooms that are typically found growing outdoors on wood causing white rot, root rot, and stem rot. They are a possible allergen at high concentration	

Memnoniella	
Description	**Characteristic**
These are mycotoxin producing spores related to and often found in conjunction with Stachybotrys. These grow well on water damaged cellulose containing building materials such as sheetrock, paper, wallpaper, and textiles.	

Nigrospora	
Description	**Characteristic**
These are typically found on decaying plant material and soil and are usually not found growing indoors. They are a potential allergen causing hay fever and asthma effects.	

Oidium/Peronospora	
Description	**Characteristic**
These are plant pathogens that are common obligate parasites on leaves, stems, flowers, and fruits of higher living plants.	

Pithomyces	
Description	**Characteristic**
These are typically found on dead leaves and stems of plants. Rarely found growing indoors; however, they grow well on paper indoors given the right conditions.	

Rust	
Description	**Characteristic**
These are parasitic plant pathogens that grow on plants, grass, and trees. They are rarely found growing indoors since they require a living host, and therefore typically not found on cellulose containing building materials. They are a potential allergen causing hay fever and asthma effects.	
Smut/Myxomyces/Periconia	
Description	**Characteristic**

This is a grouping of several genera organized together in a general category that are mostly associated with living and decaying plants, wood, soil, grass, cereal crops, weeds, and flowering plants. These are rarely found growing indoors. They are a potential allergen causing hay fever and asthma effects.	

Strachybotrys	
Description	**Characteristic**
These are typically found indoors growing on water damaged cellulose containing building materials such as sheetrock, paper, and ceiling tiles. They are often referred to as "toxic black mold." They have the ability to produce mycotoxins which may cause a burning sensation in the mouth, throat, and nasal passages. Chronic exposure has been known to cause headaches, diarrhea, memory loss, and brain damage.	

Torula	
Description	**Characteristic**
These are typically found growing outdoors on leaves, roots, wood, and soil. Indoors they can be found growing on water damaged cellulose, paper, wicker, straw baskets and ceiling tiles. They are a potential allergen causing hay fever and asthma effects.	

Ulocladium	
Description	**Characteristic**
It requires very wet conditions and can commonly be found indoors in damp or wet areas such as bathrooms, kitchens, basements, and around windows. It grows well on cellulose-containing materials such as paper and straw, and on water-damaged building materials such as sheetrock. It is a common allergen causing hay fever and asthma symptoms.	

Unidentified Spores	
Description	**Characteristic**
This is a grouping of spores that cannot be categorised for various reasons. They may be weathered, disfigured, or otherwise lacking the morphological structures necessary to identify the genus.	

Hyphal Fragments	
Description	**Characteristic**
These are branched filamentous structures with cell walls. Hyphae are somewhat analogous to stems or roots in plants, whereas the spores would be analogous to the seeds. Large quantities present may indicate an active fungal colony or active fungal growth in the structure	

Pollen	
Description	**Characteristic**
These are a fine, powdery substance produced by the anthers of seed-bearing plants, trees, grasses, flowers, and weeds. They are an allergen that causes hay fever symptoms.	

Note

Sections 8-9 may be required where health issues are a concern. These provide additional sampling and analysis to identify the species, thereby determining the hazard levels. These are the primary indicators of building-related illness and can be used to identify mycotoxin exposure.

8. Section 8 (Hazard Assessment) is known as ERMI Settled dust and QPCR-DNA dust analysis for mould speciation (

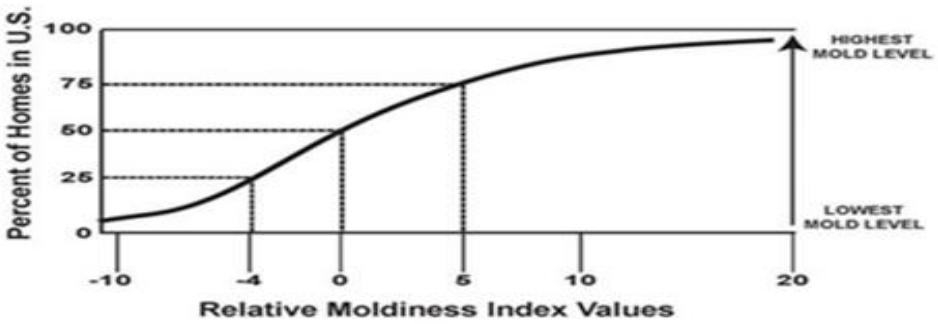
8.1. The ERMI score should not be considered a risk or hazard assessment, as we usually collect dust from different areas. The risk score is derived from the presence of Group 1 moulds, which are likely to produce mycotoxins and are known as potentially toxigenic

8.2. These moulds are usually present at detection levels in ambient air and are considered markers of water damage and potential health hazards.

8.3. While some may interpret the levels of ERMI score as a health risk, the reality is we have shown adjacent areas can have differing levels and scores (see our paper on mould sampling failures) in free advice Professional Letter (wpdesign.website)

8.4. The ERMI score has no significant value, but we interpret the actual species as a risk factor. The information regarding group 1 mould species may be of significant benefit to your medical practitioner

8.5. The “Environmental Relative Mold Index” table below (ERMI) shows the typical results from 1096 homes analysed by the Environmental Protection Agency.



8.6. The EPA developers of ERMI categorically state its use is for professional research use only, and no significance as to risk or hazard can be gained from scores

8.7. No health assessments can be concluded from the ERMI score. Still, the lab results may provide important information regarding restoration and medical treatment, and the overall risk and hazards faced in the sampled areas.

8.8. An ERMI score of 0 would represent the average level of mould contamination (50%) of homes investigated. It should be pointed out here that a minus score

does not mean there is no health hazard or low risk. We have assessed the species, particularly in the group one section.

8.9. We do not advocate using the score as a risk assessment. Building Forensics assesses species from group 1 only, as a hazard assessment

8.10. We have included the risk table below for those who may require information on the ERMI score.

8.11. After sampling over 1000 homes in the UK, we can provide a baseline of high or low, although this is not a hazard or risk assessment

Level	ERMI Values	Interpretation	Comment
Q 1	Less than - 4	Low Relative Moldiness Index	Further investigation is not needed to determine the sources of the mold.
Q 2	-4 to < 0	Low - Medium Relative	Further investigation may be needed to determine the sources of the mold if occupants have been reactive, sensitized, genetically predisposed or otherwise immuno-compromised.
Q 3	0 to < 5	Medium- High Relative	
Q 4	5 to < 20	High Relative Moldiness Index	Source and cause of mold should be determined and remediation is undertaken, reducing the ERMI to levels below Q2.
	> 20	Very High Relative	

Lab analysis Results - Lounge and bedroom

8.11.1. There are several very toxic mould species at levels over 1000-fold higher than normal

8.11.2. The species identified can reduce your immune system, and the species in Group 1 are potentially toxigenic

8.11.3. The species in group 1 are most likely to be a concern to healthcare professionals who may link your symptoms to exposure.

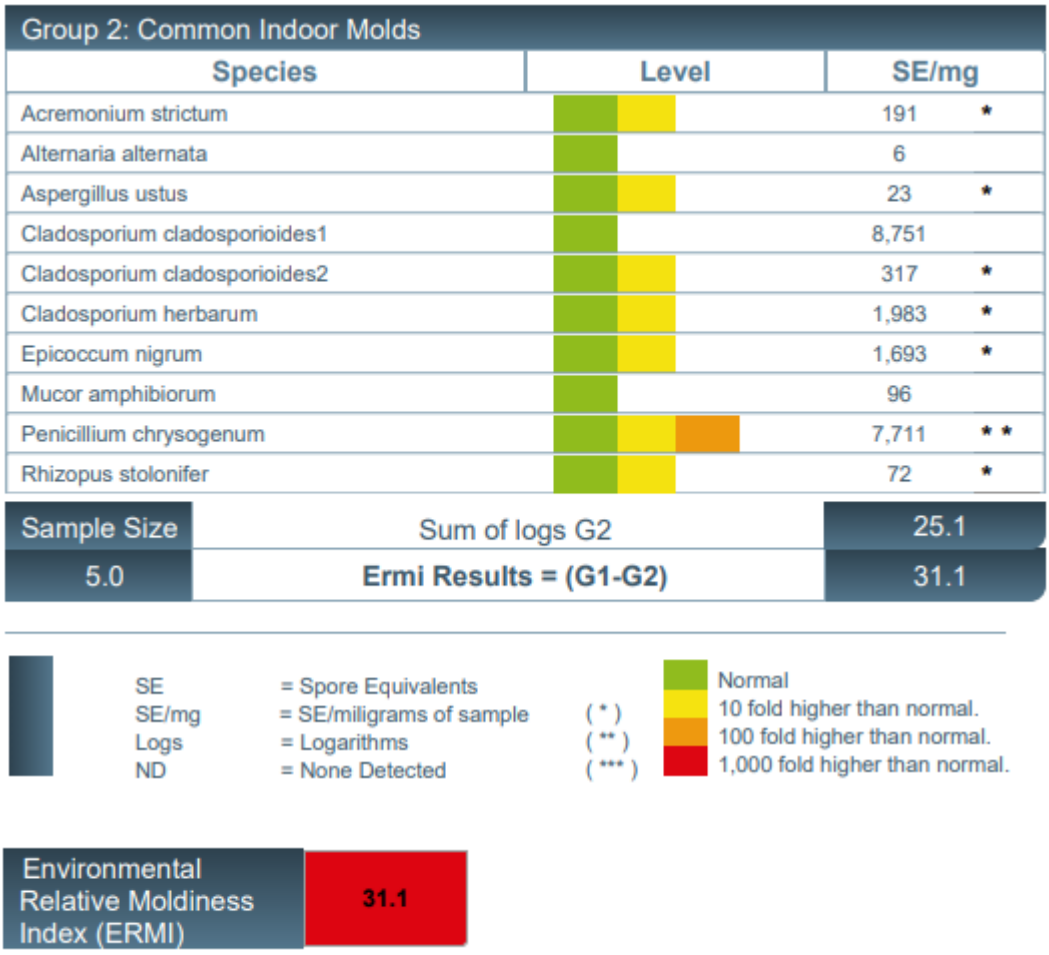
8.11.4. We do not recommend using the ERMI score to assess health risks. However, the species loading is an extremely important factor in hazard assessment

8.11.5. Your score of 31 is in Q4 and well above the tigger of 15

Group 1: Water Damage Molds			
Species	**Level**	**SE/mg**	
Aspergillus flavus/oryzae		235	* *
Aspergillus fumigatus		61	*
Aspergillus niger		218	*
Aspergillus ochraceus		4	
Aspergillus penicillioides		12,537	*
Aspergillus restrictus		9,311	* * *
Aspergillus sclerotiorum		8	
Aspergillus sydowii		N.D	
Aspergillus unguis		N.D	
Aspergillus versicolor		7,071	* *
Aureobasidium pullulans		5,264	*
Chaetomium globosum		51	*
Cladosporium sphaerospermum		199	
Eurotium (Asp.) amstelodami		12,436	* *
Paecilomyces variotii		N.D	
Penicillium brevicompactum		4,319	* *
Penicillium corylophilum		139	*
Penicillium crustosum		355	*
Penicillium purpurogenum		17	*
Penicillium Spinulosum		52	*
Penicillium variabile		22	
Scopulariopsis brevicaulis/fusca		19	
Scopulariopsis chartarum		224	*
Stachybotrys chartarum		5	
Trichoderma viride		2,937	* *
Wallemia sebi		11,003	*
Sum of logs G1		56.3	

Note

Although not as toxic as Group 1, the species identified in Group 2 are still potentially allergenic and have some toxicity.



Group 2: Common Indoor Molds		
Species	Level	SE/mg
Acremonium strictum		191 *
Alternaria alternata		6
Aspergillus ustus		23 *
Cladosporium cladosporioides1		8,751
Cladosporium cladosporioides2		317 *
Cladosporium herbarum		1,983 *
Epicoccum nigrum		1,693 *
Mucor amphibiorum		96
Penicillium chrysogenum		7,711 * *
Rhizopus stolonifer		72 *

Sample Size	Sum of logs G2	25.1
5.0	**Ermi Results = (G1-G2)**	31.1

SE = Spore Equivalents
SE/mg = SE/miligrams of sample
Logs = Logarithms
ND = None Detected

(*) Normal
(**) 10 fold higher than normal.
(***) 100 fold higher than normal.
1,000 fold higher than normal.

Environmental Relative Moldiness Index (ERMI)	31.1

8.12. Significant results

Building Forensics has analysed over 750 ERMI scores in the UK

- Your score is almost 2.5 times higher than the UK national average
- This HERTSMI score is 4 times the level considered safe for CIRS patients to be exposed to. (See note)

9. HERTSMI 2

9.1. This is a risk assessment of hazards identified in the QPCR-DNA sample analysis. This calculation is based on thousands of patients with varying exposures and their responses to medications, as recorded by their practitioners. The higher the HERTSMI 2 score is, the less likely the CIRS patient is to respond to treatment while those contaminants remain at high levels

HERTSMI 2 Score - Lounge and bedroom

HERTSMI-2 Species	Spore E./mg	Weighting	
Aspergillus penicillioides	12,537	10	*
Aspergillus versicolor	7,071	10	* *
Chaetomium globosum	51	6	*
Stachybotrys chartarum	5	4	
Wallemia sebi	11,003	10	*
Sample Size 5.0 mg	HERTSMI-2 Score =	40	

9.2. HERTMI 2 Table of risk

Color-coded interpretation [10]	
If 10 or below	In only 1.7% of cases, re-occupancy of building following mold remediation has led to relapse of CIRS-WDB symptoms
If between 11 to 15	Borderline. Further remediation and re-assessment is indicated
If greater than 15	Re-occupancy is ill-advised until further remediation and re-assessment are conclusive.

9.3. Genetically close –related species may be detected in the indicator assay

As reported	Includes
Eurotium (Asp.) amstelodami	E. chevalieri, E. herbariorum, E. rubrum and E. repens.
Penicillium spinulosum	P. glabrum, P. lividum, P. pupurescens, and P. thomii.
Trichoderma viride	T. koningii and T. atroviride.
Aspergillus restrictus	A. caesillus and A. conicus.
Mucor amphibiorum	M. circinelloides, M. hiemalis, M. indicus, M. mucedo, M. racemosus, M. ramosissimus.
Rhizopus zygosporus	R. homothalicus, R. microsporus, R. oligosporus, R. oryzae.
Penicillium crustosum	P. camembertii, P. commune, P. echinulatum, P. solitum.
Aspergillus niger	Know called Aspergillus basiliensis
Scopulariopsis brevicaulis/fusca	Has been renamed as species of Microascus[10]
Wallemia sebi	W. mellicola, W. canadensis[11]

Section 10 Endotoxins

This is an addition but not usually recommended unless the budget allows, particularly where long-term mould treatments have failed, black water events/flooding have occurred, or stomach issues persist.

10. Endotoxins - Lounge and bedroom

This score is low, and endotoxins are not an issue.

Reference Number	Locations	Result EU/mg	Q Level
410797-2	Lounge + Bedroom	**24**	**Q 1**

Color-coded interpretation	
If 100 or below	Recommended for CIRS.
If 200 or below	Recommended for No CIRS.
If greater than 200	Remediation is needed.

11 Actinomycetes

Actinomycosis is believed to play a significant part in building-related illnesses and may be responsible for many symptoms, which are sometimes misdiagnosed as mould illness and CIRS. Generally, bacteria grow before mould; some studies suggest bacteria may be a higher risk factor in mould illness than mycotoxins.

11 - Lounge and bedroom

Actino Score	23
Pathogen Score (Q Level)	Q4
Black Water Score (Q Level)	Q1

Actino Score interpretation (Water Damage)	
20 or below	Indicative of a Healthy Building
Between 21 to 23	Further investigation needed
Greater than 24	Suggestive of Building Related Illness.

	Total Species	Pathogen Species	Be/mg Total	Q Level
Bacteria	3,074	214	8,583,513	Q 4
Actino	708	61		

Summary of Bacteria's Order

Orders Detected	Abundance B.E/mg	Families	Abundance	Fold ▲	Diversity	Fold ▲	Pathogen
Actinomycetales	1,106,585	41	23 %	0.9	15.7 %	0.9	61
Bacillales	857,964	14	18 %	1.4	5.4 %	0.8	24
Clostridiales	373,495	25	8 %	2.5	9.6 %	1.2	36
Rhizobiales	190,651	13	4 %	1.5	5.0 %	1.1	1
Rhodospirillales	172,874	3	4 %	0.8	1.1 %	0.7	0
Acidimicrobiales	122,831	3	3 %	5.8	1.1 %	0.9	0
Rhodobacterales	116,230	1	2 %	0.9	0.4 %	0.6	0
Sphingomonadales	115,543	2	2 %	1.8	0.8 %	0.8	0
Gaiellales	112,873	1	2 %	1.7	0.4 %	0.3	0
Solirubrobacterales	94,334	3	2 %	6.0	1.1 %	1.0	0

▲ = Fold over normal top orders

Table only list 10

Q1 Quartile Q2 Quartile Q3 Quartile Q4 Quartile

B.E	= Bacteria Equivalents	Logs	= Logarithms
B.E/mg	= B.E/miligrams of sample	ND	= None Detected
(* *)	100 fold higher than normal.	P	= Human Pathogen
(* * *)	1,000 fold higher than normal.		

Normal values are based on bacteria distribution in 1,000 US homes. Distribution of bacteria species are also ranked on Quadriles, only elevated species are highlighted with a color code for Q3 and Q4.

Actino Species Detected

	Genus & Species	B.E/mg	Comments		Q Level
1	Actinomyces funkei	343	P		
2	Actinomyces massiliensis	343			
3	Actinomyces naeslundii	343	P		
4	Actinomyces nasicola	86			
5	Actinomyces odontolyticus	1,803	P		
6	Actinomyces viscosus	172	P		
19	Corynebacterium amycolatum	5,751	P		
20	Corynebacterium appendicis	28,669		*	
21	Corynebacterium aurimucosum	4,893			
22	Corynebacterium capitovis	515			
23	Corynebacterium glycinophilum	343			
24	Corynebacterium imitans	5,064	P		
25	Corynebacterium jeddahense	601			

26	Corynebacterium jeikeium	23,004	P	*	
27	Corynebacterium kroppenstedtii	4,034	P		
28	Corynebacterium lactis	429			
29	Corynebacterium macginleyi	429	P		
30	Corynebacterium pilbarense	21,373			
31	Corynebacterium pilosum	86			
32	Corynebacterium simulans	6,094	P		
33	Corynebacterium singulare	43,347			
34	Corynebacterium sputi	172			
35	Corynebacterium suicordis	601	P		
36	Corynebacterium tapiri	343			
37	Corynebacterium thomssenii	7,124	P		
38	Corynebacterium tuberculostearicum	255,617	P		
39	Corynebacterium ureicelerivorans	4,635	P		
40	Corynebacterium uterequi	172			
43	Cryobacterium arcticum	343			
61	Mycobacterium aichiense	1,373	P		
62	Mycobacterium arabiense	343			
63	Mycobacterium cookii	172			
64	Mycobacterium duvalii	1,373			
65	Mycobacterium hippocampi	343			
66	Mycobacterium hodleri	1,545			
67	Mycobacterium holsaticum	172			
68	Mycobacterium insubricum	86	P		
69	Mycobacterium iranicum	343			
70	Mycobacterium madagascariense	3,348			
71	Mycobacterium moriokaense	1,202			
72	Mycobacterium parafortuitum	258			
73	Mycobacterium rhodesiae	258			
74	Mycobacterium sediminis	1,631			
75	Mycobacterium sphagni	343			
82	Propionibacterium acidipropionici	687			
83	Propionibacterium acnes	28,411	P		
84	Propionibacterium cyclohexanicum	86			
85	Propionibacterium jensenii	172			
87	Streptomyces aidingensis	172			

88	Streptomyces carpaticus	343			
89	Streptomyces graminilatus	429			
90	Streptomyces nanshensis	172			
91	Streptomyces panacagri	172			

Other Elevated Species Detected

	Genus & Species	B.E/mg	Comments		Q Level
1	Acetivibrio cellulolyticus	1,888			
2	Acetivibrio ethanolgignens	429	P		
3	Agromyces ramosus	4,463		*	
4	Alkaliphilus oremlandii	773			
5	Amaricoccus macauensis	12,103		*	
6	Ammoniphilus oxalaticus	10,472		*	
7	Anaerobacterium chartisolvens	7,983			
8	Anaerococcus nagyae	2,146			
9	Anaerococcus provenciensis	2,747			
10	Anaerococcus senegalensis	601			
11	Anaerococcus vaginalis	773	P		
12	Arthrobacter russicus	2,318		*	
13	Bacillus asahii	7,210		*	
14	Bacillus benzoevorans	19,914		*	
15	Bacillus circulans	48,411		*	
16	Bacillus coagulans	5,837		*	
17	Bacillus foraminis	4,120		*	
18	Bacillus nealsonii	107,466		*	*
19	Bacillus niacini	23,261		*	
20	Bacillus oceanisediminis	27,982		*	
21	Bacillus psychrosaccharolyticus	28,154		*	
22	Beijerinckia mobilis	8,412		*	
23	Blautia faecis	2,747			
24	Blautia luti	6,953			
25	Catabacter hongkongensis	429			
26	Coprococcus eutactus	7,124		*	
27	Corynebacterium accolens	14,077	P	*	
28	Corynebacterium massiliense	5,408		*	

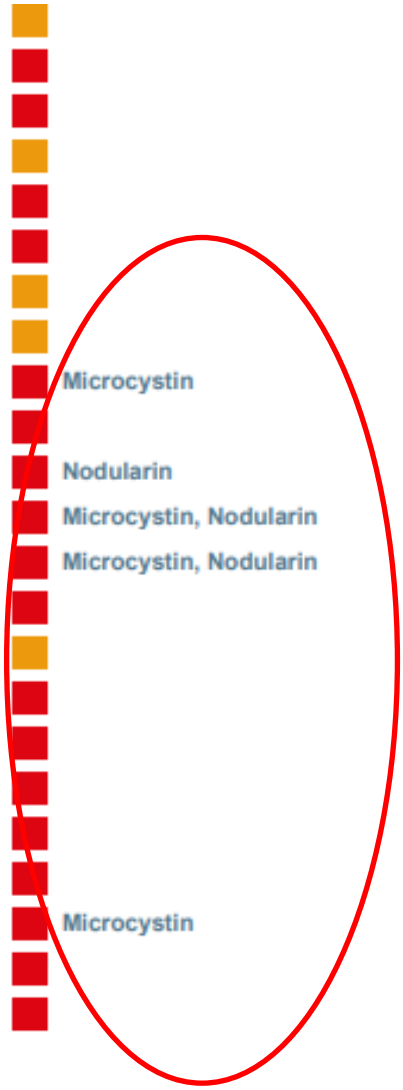
29	Defluviicoccus vanus	77,080	*	
30	Diplorickettsia massiliensis	11,159	*	
31	Dorea longicatena	2,747		
32	Dyadobacter hamtensis	4,721	*	
33	Eubacterium coprostanoligenes	2,146		
34	Finegoldia magna	11,244 P	*	
35	Friedmanniella antarctica	4,721	*	
36	Fusicatenibacter saccharivorans	3,691		
37	Gaiella occulta	112,873	*	
38	Garciella nitratireducens	1,288		
39	Gemmiger formicilis	4,549		
40	Gracilibacter thermotolerans	4,463		
41	Hydrogenispora ethanolica	3,605		
42	Hyphomicrobium vulgare	11,588	*	
43	Intestinimonas butyriciproducens	773		
44	Kocuria palustris	83,088	*	
45	Luteolibacter luojiensis	7,725	*	
46	Microlunatus ginsengisoli	6,695	*	
47	Microlunatus phosphovorus	12,446	*	
48	Nocardioides islandensis	17,854	*	
49	Oceanibacterium hippocampi	22,489	*	
50	Paenibacillus contaminans	6,094	*	
51	Paenisporosarcina macmurdoensis	3,691	*	
52	Pantoea agglomerans	687 P		
53	Pantoea vagans	2,489		
54	Papillibacter cinnamivorans	515		
55	Peptoniphilus grossensis	3,863		
56	Prevotella copri	14,420	*	
57	Pseudonocardia yuanmonensis	28,326	*	
58	Rickettsia typhi	14,077 P	*	
59	Rubellimicrobium mesophilum	17,510	*	
60	Rubellimicrobium roseum	12,189	*	
61	Ruminococcus callidus	4,721	*	
62	Siccibacter turicensis	258		
63	Solirubrobacter ginsenosidimutans	40,428	*	
64	Sporacetigenium mesophilum	3,004		

65	Sporosarcina contaminans	11,244		*	
66	Staphylococcus devriesei	15,279		*	
67	Staphylococcus haemolyticus	10,987	P	*	
68	Staphylococcus saprophyticus	8,669	P	*	
69	Symbiobacterium terraclitae	687			
70	Thermoflavimicrobium dichotomicum	6,094		*	
71	Turicibacter sanguinis	17,081		*	
72	unidentified bacterium	1,717		*	

Cyanobacteria Species Detected

	Genus & Species	B.E/mg	Comments	Q Level
1	Aerosakkonema funiforme	343		
2	Anabaena cylindrica	1,030		
3	Anabaena flosUnclassifiedaquae	515		Microcystin
4	Anabaena sp	2,232		Anatoxin-a, Microcystin
5	Aphanizomenon flosUnclassifiedaquae	2,918		Cylindrospermopsins, Saxitoxin
6	Brasilonema bromeliae	3,262		
7	Brasilonema terrestre	4,206		
8	Calochaete cimrmanii	773		
9	Calothrix desertica	1,717		
10	Calothrix elsteri	258		
11	Chamaesiphon minutus	2,403		
12	Chroococcidiopsis thermalis	1,030		
13	Coleofasciculus chthonoplastes	86		
14	Crinalium epipsammum	343		
15	Crocosphaera watsonii	258		
16	Cyanobacterium aponinum	86		
17	Cyanobacterium stanieri	258		
18	Cyanospira rippkae	343		
19	Cylindrospermum siamensis	3,262		
20	Cylindrospermum stagnale	6,781		
21	Fischerella muscicola	86		
22	Gloeobacter kilaueensis	343		
23	Gloeothece membranacea	86		
24	Halomicronema excentricum	944		

25	Halospirulina tapeticola	172		
26	Hassallia andreassenii	343		
27	Hassallia antarctica	2,489		
28	Iphinoe spelaeobios	86		
29	Kastovskya adunca	515		
30	Leptolyngbya foveolarum	858		
31	Loriellopsis cavernicola	172		
32	Lyngbya aestuarii	86		
33	Microcystis aeruginosa	343		Microcystin
34	Myxosarcina sp	5,751		
35	Nodularia spumigena	5,322	*	Nodularin
36	Nostoc sp	6,438		Microcystin, Nodularin
37	Nostoc sp	5,064		Microcystin, Nodularin
38	Oscillatoria neglecta	1,202		
39	Oxynema thaianum	172		
40	Phormidium etoshii	429		
41	Planktothricoides raciborskii	2,232		
42	Pleurocapsa sp	1,202		
43	Starria zimbabweensis	1,030		
44	Synechococcus elongatus	172		
45	Synechococcus sp	258		Microcystin
46	Tolypothrix sp	258		
47	Tychonema bourrellyi	515		



ACTINO INDEX

Human Habitat (HH)

Species	B.E/mg		
Actinomadura chibensis	ND		
Actinomyces canis	ND		
Actinomyces europaeus	86	P	*
Actinomyces meyeri	ND		
Actinomyces neuii	86	P	
Actinomyces odontolyticus	1,803	P	*
Actinomyces turicensis	2,146	P	**
Corynebacterium accolens	14,077	P	**
Corynebacterium amycolatum	5,751	P	*
Corynebacterium argentoratense	ND		
Corynebacterium coyleae	429	P	*
Corynebacterium falsenii	172	P	
Corynebacterium glucuronolyticum	ND		
Corynebacterium hansenii	ND		
Corynebacterium imitans	5,064	P	
Corynebacterium jeikeium	23,004	P	**
Corynebacterium kroppenstedtii	4,034	P	
Corynebacterium matruchotii	86	P	
Corynebacterium minutissimum	ND		
Corynebacterium propinquum	ND		
Corynebacterium resistens	ND		
Corynebacterium riegelii	172	P	*
Corynebacterium simulans	6,094	P	**
Corynebacterium striatum	86	P	
Corynebacterium sundsvallense	ND		
Corynebacterium tuberculostearicum	255,617	P	**
Corynebacterium ureicelerivorans	4,635	P	*
Corynebacterium xerosis	ND		
Dermatophilus congolensis	172	P	
Propionibacterium acnes	28,411	P	*
Propionibacterium avidum	858	P	*
Propionibacterium granulosum	429	P	*
Rothia mucilaginosa	858	P	*

Soil Habitat (SH)

Species	B.E/mg		
Arthrobacter creatinolyticus	ND		
Arthrobacter crystallopoietes	86	P	
Brevibacterium mcbrellneri	258	P	*
Brevibacterium paucivorans	3,691	P	**
Clavibacter michiganensis	1,288	P	*
Curtobacterium flaccumfaciens	2,403	P	*
Gordonia terrae	86	P	
Nocardia higoensis	ND		
Rathayibacter tritici	ND		
Rhodococcus equi	ND		
Rhodococcus fascians	ND		
Saccharopolyspora rectivirgula	1,202	P	
Sanguibacter suarezii	429	P	*

B.E = Bacteria Equivalents
BE/mg = BE/milligrams of sample
ND = None Detected
P = Human Pathogen

(*) 5 fold higher than normal.
(**) 50 fold higher than normal.
(***) 500 fold higher than normal.

Normal values is based on bacteria distribution on 1,000 US homes.

Dominance Index (DI)	**1.1**
Prevalence Index (PI)	**0.8**

Dominance Index (DI)	Lower than 2.0	Likely safe for CIRS
	Higher than 2.0	Likely not safe for CIRS
Prevalence Index (PI)	Lower than 2.0	Likely safe for CIRS
	Higher than 2.0	Likely not safe for CIRS

Bacterial analysis results

The lab's colour-coded report shows your home to be in the fourth quantile, which is contamination above 75% worse than average.
The bacteria present are associated with cancer, including Liver and respiratory paralysis. Another bacterial species is also associated with cancer, and it can cause protein phosphatase inhibition. The levels identified from this sample are NOT very high, but you should know their presence if symptoms and/or treatment have been unsuccessful.

12. PCR-DNA Air Sampling Hazard Assessment

This sampling procedure measures the toxic loading of the air you breathe. Unlike the total spore counts, this method measures and speciates hyphal fragments and spores. This means you will discover how contaminated the air you may be exposed to is. These should only be used when health issues or high risks have been identified.

Sample Description: Front Top & Landing **Reporting Limit:** 3 Spores/Cubic Meter

Species Identification	Spores/m3 of Air Inside	Relative Abundance (%) of Species
Acremonium strictum	ND	0.00
Alternaria alternata	ND	0.00
Anigr*	ND	0.00
Aspergillus flavus/oryzae	ND	0.00
Aspergillus fumigatus, Neosartorya fischeri	212	16.40
Aspergillus ochraceus/ostianus	ND	0.00
Aspergillus penicillioides	ND	0.00
Aspergillus restrictus/caesillus/conicus	31	2.40
Aspergillus sclerotiorum	ND	0.00
Aspergillus sydowii	ND	0.00
Aspergillus unguis	ND	0.00
Aspergillus ustus	ND	0.00
Aspergillus versicolor	ND	0.00
Aureobasidium pullulans	21	1.62
Chaetomium globosum	ND	0.00
Cladosporium cladosporioides svar. 1	13	1.01
Cladosporium cladosporioides svar. 2	293	22.66
Cladosporium herbarum	3	0.23
Cladosporium sphaerospermum	12	0.93
Eamst*	15	1.16
Epicoccum nigrum	ND	0.00
Muc1*	ND	0.00
Paecilomyces variotii	ND	0.00
PenGrp2*	36	2.78
Penicillium brevicompactum/stoloniferum	ND	0.00
Penicillium chrysogenum	ND	0.00
Penicillium corylophilum	ND	0.00
Penicillium purpurogenum	ND	0.00
Penicillium variabile	ND	0.00
Pspin2*	ND	0.00
Rhizopus stolonifer	ND	0.00
Scopulariopsis brevicaulis/fusca	ND	0.00
Scopulariopsis chartarum	ND	0.00
Stachybotrys chartarum	ND	0.00
Trichoderma viride/atroviride/koningii	631	48.80
Wallemia sebi	26	2.01
Total Spores:	1,293	

*These assays detect four or more species.

Eamst	*Eurotium (Aspergillus) amstelodami/chevalieri/herbariorum/rubrum/repens*
Anigr	*Aspergillus niger/awamori/foetidus/phoenicis*
PenGrp2	*Penicillium crustosum/camemberti/commune/echinulatum/solitum*
Pspin2	*Penicillium glabrum/lividum/purpurescens/spinulosum/thomii*
Muc1	*Mucor amphibiorum/circinelloides/hiemalis/indicus/mucedo/racemosus/ramosissimus and Rhizopus azygosporus/homothalicus/microsporus/oligosporus/oryzae*

13. Survey Mycotoxins

Survey 5 focuses on mycotoxin presence and exposure. Some of our clients have had urine sampled for a limited range of mycotoxins with American labs who often find elevated levels of Ochratoxin A, Fusarium, Sterigmatocysin, Zearalenone, etc. This can be a worry when levels are present or elevated, but the reality is that there are over 700 different mycotoxins that can affect health, and we sample for all these and the most significant mould species that produce them. Sampling in the wrong areas may provide false negative results, and survey 1 reduces that risk.

Mould species	***Mycotoxin identified in urine***
Aspergillus fumigatus	Gliotoxin
Aspergillus flavus	Aflatoxin
Aspergillus niger	Ochratoxin
Aspergillus versicolor	Sterigmatocystin
Aspergillus ochraceus	Mycophenolic Acid
Aspergillus penicillioides	Chaetoglobosins
Penicillium brevicompactum	Macrocyclic Trichothecenes
Chaetomium globosum	
Wallemia sebi	
Stachybotrys chartarum	

NOTE
Mycotoxins, especially the seven identified above, are not the only cause of mould-related illness.

14. Conclusions

14.1. The following conclusions are based on the information provided to us or gathered through the survey, coupled with laboratory analysis and monitoring equipment. While this report was written by a qualified expert in Indoor Environmental Health, you must recognise that this report is a basic, non-intrusive survey and represents a snapshot in time. You should confirm all findings before making life-changing decisions

14.2. The air is extremely contaminated

14.3. Surfaces are also contaminated

14.4. The moisture content in the walls is elevated at the bottom compared to higher up the wall, and this may be indicative of rising damp

14.5. **T**he roof has no ventilation, and the loft is an issue

14.6. The levels of airborne contamination, in terms of spore counts, are incredibly high and must be reduced; the source and causation must be remediated

14.7. The Gram-negative bacteria are at low levels and not considered an issue.

14.8. The Gram-positive Actino levels are a little high, and I respectfully suggest you forward these results to your healthcare professional

14.9. The property and its contents are extremely contaminated and pose a serious health risk.

14.10. The health symptoms you described to me could, I believe, be directly attributable to building-related contamination

14.11. If you have not yet engaged a healthcare professional or need some guidance, please come back to Building Forensics, and we will provide free self-help guidance and a list of appropriate healthcare support specialists

15. Recommendations

The property's contents should be risk assessed for decontamination or replacement. We can provide free guidance upon request and offer advice if you are pursuing a claim.

The roof and insulation issues must be fixed, with insulation and ventilation a priority.
The guarantee on the new floor should be reviewed, and we can provide free supportive information and guidance on this.

I recommend installing a new ventilation system, such as HRVS, as noted in section 16 below.
The property must be professionally decontaminated, and immediate risk reduction and knockdown of airborne contaminants must be considered if you remain in the property. This will be a temporary risk reduction until remediation is undertaken, as any reduced contamination will be replaced by reservoirs and defects identified in the survey.

We can decontaminate the property to various levels of risk reduction. However, costs and budget may dictate the outcome.
You can Google decontamination companies and find a variety of guaranteed results. You should review these carefully. As our client, Building Forensics will provide an unbiased, clear, and concise opinion on whoever or whatever you choose. Please also look at our guide on choosing a contractor.

I warn that any process costing under £2000 and completed in a day or two will unlikely provide any worthwhile result. We can provide you with sound advice regarding DIY monitoring and verification.

16. Decontamination Warning and Conflicts of Interest

If you have been diagnosed with CIRS or building-related illness and treatment has been unsuccessful or symptoms have worsened, you should discuss this report with your healthcare professional. If your doctor confirms the presence of potential contaminants in your home, you may require decontamination. You need a different result from the usually advertised “Mould Removal Services.' The contamination that

triggers an inflammatory response is nonviable, dead, and, in fact, chemical allergens and toxins. Correct procedures are essential.

We provide free information to assist you in resolving any issues we identify. You should know that removal, NOT killing, mould is the only medically sound protocol healthcare professionals recognise.

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