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Building Forensics
BUILDING RELATED ILLNESS

EnviroScope®
&
Investigation Report

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Qualified Member

Chartered Institute of Environmental Health

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Survey Date

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Summary of findings and taken from pages from Page 1 to p47

This report combines different forms of sampling and analysis, plus a qualified opinion of circumstances.

Jeff Charlton, the author of this report, is a qualified Indoor Environmental Hygienist whose role is to assess risk and possible hazards within the framework of non-intrusive investigation with limited analysis. Enviroscope AI was used to assist in the identification of high-risk areas in which to undertake further investigations for water damage and bio amplification. The accuracy of data revolves around sampling frequency, and to contain costs, limited sampling and analysis were undertaken for this report.

Health Concern

To comply with your requirement to assess possible triggers for your current illness, I have matched the sampling to your target organs and symptoms. We have confirmed that mould, albeit a health issue, is minor compared to the specific bacteria identified. Some bacterial species exceed the safe level by more than 2, and others are 100-fold higher than usual.

The presence of airborne zearalenone, a mycotoxin, is a significant health alert, and this can have serious consequences for men, but especially women, where it can cause early menopause and spontaneous miscarriage. If you require a toxicologist to interpret these results, please let me know, and I will provide a couple of names.

The report identifies the need for a qualified, possibly chartered building surveyor to assess the roof ventilation and/or insulation issues, the floor level and subfloor ventilation, and the drainage installation to the rear French drainage system, which may be the source of some, but not all, bacteria.

1. Contractors & Scope of Work

The property must be remediated by qualified contractors certified in fine particle cleaning to a level known as medically safe.
They must employ engineering controls with negative pressure units in all areas where moisture damage is considered a confirmed or estimated risk.

Moisture content is not an indicator in your home, as several areas have been allowed to dry naturally without intervention.
This will lead to desiccated biocontamination, which is a higher risk factor than active mould growth.
This report, which was not intrusive, has identified some, if not all, risk and hazard areas.
Areas identified as water-damaged must be remediated at least to IICRC S520 standards and compliant with BS 12999 and PAS 64. All areas treated should be investigated and confirmed clean, sanitised, and remediated prior to closing up.

Following the remediation of areas, the whole property will require

decontamination of surfaces, contents and air.

This will require knowledge of biological decontamination, controls, and fine particle medically sound air cleaning and remediation.

A qualified Indoor Environmental Professional should monitor the contractor's work.

2. The visual survey

This identifies floor surface levels and possible conflicts with subfloor ventilation, paint coatings that prevent the brickwork from breathing, and soffit and roof ventilation issues.

The roof cupboards have elevated spore counts, which the roofing expert should assess as likely due to a lack of ventilation, dew-point condensation, or inadequate insulation.

3. Drainage issues

Odour and French drains may be affected by poor engineering and may be the source of very high Endotoxins in the top bedroom. Although not tested in other areas, these may also be present elsewhere on the property. You should note that the bathroom bacteria count was capped in the Enviroscope report as it was an outlier, and this may be a source of Endotoxins. Bacteria counts were also elevated in the dining room and the Gymnasium.

4. Moisture issues

The ground floor was wet and at risk of decay. The wood floor had varying moisture content, which may indicate isolated subfloor leaks or poor ventilation.

The shower unit in the adjacent room to the top bedroom has a leak affecting two walls and the floor. This moisture is assumed to have caused biological amplification in the wall and floor cavities and to have affected the adjacent bedroom partition wall. This can be expected to be a significant source of exposure.

5. Bacteria -VOCs and CO2

These markers were elevated in similar rooms or areas together with elevated specific humidity (moisture in the air. These areas are individually identified in the report

6. Total Spore Counts

These lab results showed that all areas of the house tested had elevated Pencillium/Aspergillus levels compared to ambient conditions. Two free cassettes were provided to confirm the expected risk of sauna contamination, and indeed, the sauna bedroom. The spore counts also identified Cladosporium, another water-damage indicator, as the highest in the sauna and the top bathroom adjacent to the bedroom.

While the Enviroscope shows the top bedroom as Q1-Q2 and below the other

areas tested for Total Spore counts, it should be recognised that both sampling methods have benefits and limitations. Results and areas are open to interpretation and various capping issues. Different air movement, height and volumes will often show variations. The Enviroscope identified the mould source in walls and ceilings.

7. Lab analysis of Mould and Bacteria

The single ERMI Triple swab was used only in the main bedroom, where the Enviroscope identified the highest total risk factors. This combination identified several toxigenic mould species at tenfold the levels of normally expected species. The analysis also showed endotoxins at 503 counts against an action level of 100 and a health risk over 200.
Gram-positive Actinos are up to 100-fold higher than normal

8. Health Risk Review – Bacterial & Endotoxin Findings

This report reviews the bacterial species and endotoxin results in relation to Dr. Shoemaker's CIRS (Chronic Inflammatory Response Syndrome) framework. Findings indicate unsafe exposure conditions with high risk to occupant health.
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Endotoxin:

- Measured: **508 EU/mg**
- Action Level (Shoemaker): **200 EU/mg**
- Interpretation: >2.5× above safety threshold. Endotoxins drive inflammation, immune dysregulation, and neurological effects.

Actinobacteria:

Multiple species detected (Actinomyces, Corynebacterium, Mycobacterium, Propionibacterium) at
Q3–Q4 levels, several at 10-fold above normal. Risks include hypersensitivity pneumonitis,
granulomatous lung disease, biofilm persistence, and systemic inflammation.

Cyanobacteria:

Detected at very high levels (Brasilionema, Anabaena, Aphanizomenon, Nostoc, etc.), some >100-fold higher than normal. Known to produce cyanotoxins affecting the liver, kidneys, and nervous system. Inhalation exposure is linked to systemic toxic injury and CIRS progression.

Other Species of Concern:

- *Salmonella enterica* (Q1, abnormal indoors)
- *Stenotrophomonas maltophilia* (opportunistic pathogen)
- Soil and enteric bacteria (e.g., Pantoea, Pelotomaculum) indicate cross-contamination and biofilm reservoirs.

Shoemaker Criteria Integration:

- Endotoxin: FAIL

- Actino: FAIL
- Cyano: FAIL
- Diversity Dominance Index (DI 1.9, Q4): FAIL

Health Conclusion:
Based on Dr Shoemaker's protocols, the building is unsafe for occupation without remediation.
Apart from your CIRS diagnosis, your immune system is compromised by various bacterial species

Health Implications:
- Chronic fatigue, headaches, brain fog
- Respiratory irritation, asthma-like symptoms
- Multi-system inflammatory illness (CIRS)
- High risk for genetically susceptible individuals (HLA-DR types)

Pollen issues
The National Allergy Board monitors pollen throughout the year and has identified 300 grains as trigger points for allergic reactions in susceptible people. In this survey, we identified pollen particles in several thousand, and these may carry both their own allergens and others at sizes capable of entering the bloodstream through the lower respiratory system.

Category of Action
The following blood test should be undertaken to confirm the presence or absence and levels.
Medical Shoemaker-style labs (C4a, TGF-b1, MMP-9, VIP, MSH); HLA-DR genetic testing.

Environmental Forensic investigations identified various risk areas associated with potential reservoirs; these areas should be targeted for intrusive investigation under engineering controls, with source removal and remediation.
Verification post-remediation testing for Actino/Cyano/Endotoxin; clearance required before re-occupation.

Summary:
Severe microbial contamination (Actino, Cyano, endotoxins) has been confirmed.
Under Shoemaker's framework, the building presents a clear health hazard.
Immediate remediation and verification are required.

Enviroscope

9. Inspection Methodology – Enviroscope® System

This inspection was undertaken using the Enviroscope® airborne particle recognition system, originally developed by the British Ministry of Defence and adapted for

Building Forensics for indoor environmental health investigations. The system provides a real-time profile of airborne biological concentrations, enabling cost-effective identification of higher-risk areas and targeted hazard assessments.

Scope and Purpose

The objective of this inspection is to identify areas of higher risk by comparing results from similar regions and construction types. This comparative approach supports focused hazard assessments through additional sampling and analysis, where required.

Elevated readings are generally indicative of contamination; however, low levels of toxigenic or pathogenic substances may remain undetected. This limitation applies to all sampling and analysis methods but can often be reduced through professional interpretation of supplementary environmental factors by a competent Indoor Environmental Hygienist.

Data Captured by the Enviroscope®

- PM2.5 and PM10
- Mould spores
- Bacteria
- Viruses
- Total Bio
- Pollen
- Relative Humidity and Temperature
- Specific humidity g/kg
- CO^2
- Total Volatile Organic Compounds (TVOCs)

Factors Affecting Results

Outdoor air quality, weather conditions, time of day, and seasonal variation can influence bioaerosol levels indoors. When required, outdoor baseline readings can be taken for comparison, although comparison between different sampling areas is more useful. Enviroscope® measures aerosolised biological matter only. Potential contamination in settled dust, on surfaces, or within materials will not be detected and may require separate testing or re-suspension by disturbance.

Results & Classification

Enviroscope® results provide data and more client-friendly coloured bar charts, categorised by comparative exposure.

- Green Q1: Compared to the lowest internal levels
- Amber Q2-Q3 Above average; may warrant further investigation
- Red Q3 and above: Significantly elevated; further investigation recommended

These classifications are intended for comparative risk assessment only and do not represent hazards or safety thresholds.
The tables show the actual measured component levels, which are reflected in the Red, Amber, and Green bar charts for easier interpretation.

The final section provides a useful bar chart of the three highest areas of concern.

Limitations

This inspection was undertaken using the Enviroscope® airborne particle recognition system, initially developed by the British Ministry of Defence and adapted for Building Forensics for indoor environmental health investigations. The inspection applies only to the areas assessed. The frequency and distribution of sampling points for lab analysis influence the accuracy of findings. Enviroscope® enables more efficient sampling by identifying priority areas; however, full risk evaluation should include professional judgement, additional sampling where appropriate, and recognised best practices.

Visual Issues

I am concerned about front-to-back subfloor ventilation, and this should be

investigated. This may be especially relevant regarding the damp front lounge floor. The air brick in the front is blocked and inadequate, with non-visible to the rear

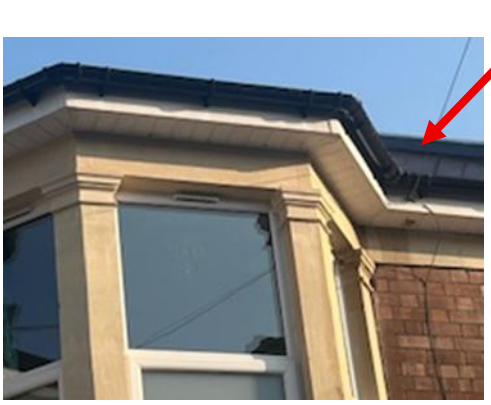
The external back walls have been painted (sealed), which may prevent the natural evaporation of moisture and result in rising damp.

Extensive plant life

There is a significant risk of topsoil mould from potted plant life. These should be removed.

While sauna use may be beneficial, the unit's interior will become highly contaminated between uses due to bio-amplification. Saunas MUST be thoroughly cleaned after use and or prior to re-use.

Roof Ventilation



A roofing surveyor should inspect the new roof for design and construction because it appears there is inadequate ventilation

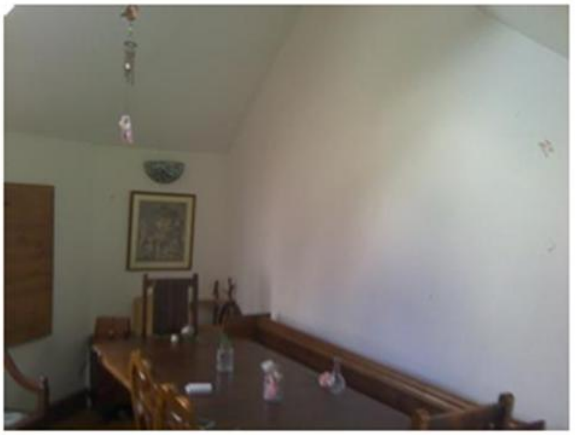
Particle counts

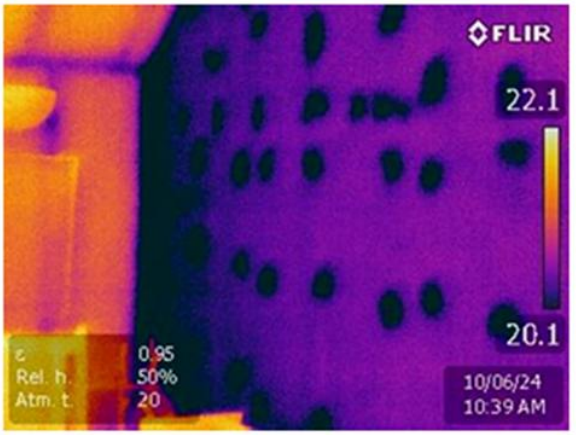
Particle counts are taken to assess possible high-risk areas
The lounge has the highest count and coupled with other factors, is likely to be a source of mould.
here

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

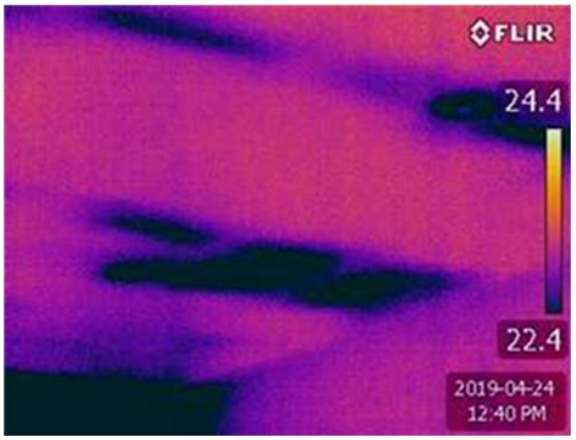
Moisture Survey

All historic leaks in all ceilings have been allowed to dry naturally, and these are a major risk factor regarding mould exposure from the cavity reservoir. While some areas are dry, some are elevated, and water-damaged areas should **be intrusively investigated** to remove mould and decontaminate/dry them. Dead desiccated mould transforms into microparticles and can act like a gas, moving through plasterboard and via cracks. It is normally expected through whole-house ventilation.





Thermal bridging risk from construction



Residual moisture from a leak two years ago

Front Lounge

Reached the trigger point for wet or dry rot

The front lounge floor is wet and approaching a level of wet rot decay and mould.
This can be remedied by improving subfloor ventilation

The moisture levels vary across the floor, and this may or may not reflect the effectiveness of localised sub-floor ventilation. Mould can be expected to develop

This can take the form of a periscope air brick or a low-cost radon-type fan with a ducted extract to cover the whole subfloor.

The rear kitchen floor appears to be the same height as the external ground; therefore, this should be investigated to assess rear subfloor ventilation

Main Bedroom

The sloped ceiling has an elevated and differing moisture content. This may be due to poor insulation, dew point condensation, or leaks, which can only be identified by intrusive investigation.

The window reveals and the ceiling around it have elevated moisture content, indicating possible mould growth, condensation, leaks, or being left open during rain. Again, this must be investigated with an intrusive investigation.

Main bedroom Headboard Wall

Here we see minor but distinct differences in plasterboard moisture content. These are not major differences but may be linked to ongoing or historic issues

Roof cupboard

Ensure the roof soffit vents are clear and the partition wall to the bedroom is well insulated; however, this may be due to soffit vents or poor local roof insulation. The roof survey will assess this.

Shower Leak

The vinyl floor shows discolouration around the suspect water leak area, which is also shown to be wet compared to adjacent areas.

Showing 22%

Concrete floor, wet and damp proof membrane, is suspected as faulty

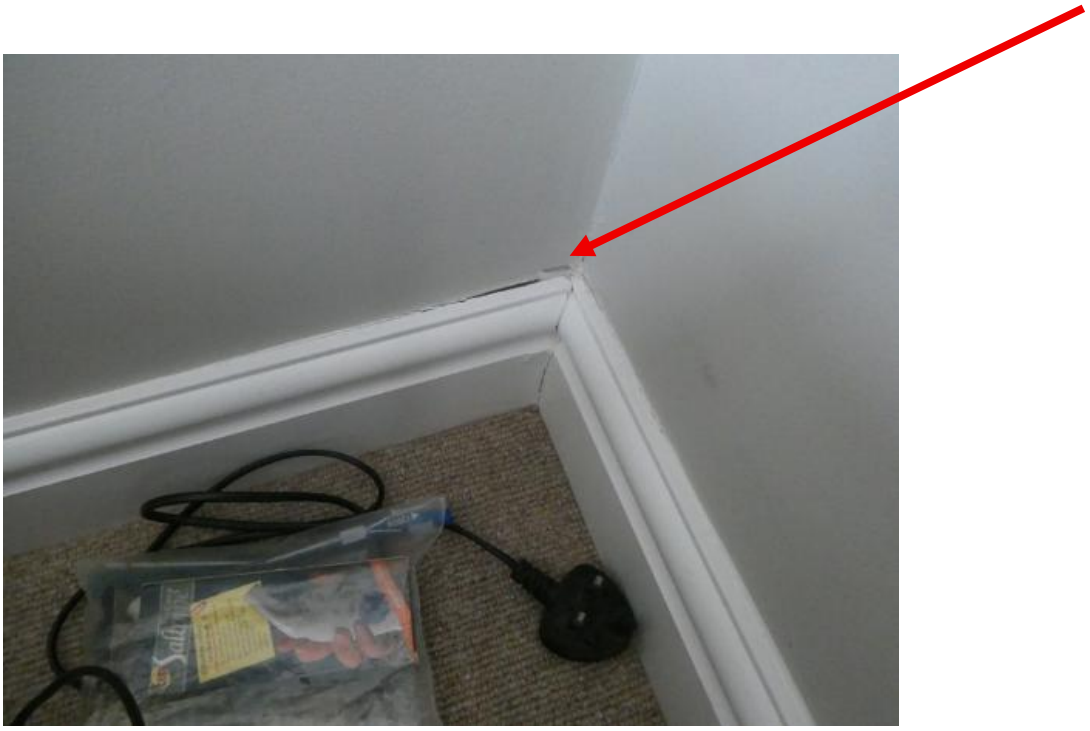
Area	Type of test	Reading	Concern
Lounge	Calcium Carbide	5.5	Wet *
Kitchen	Sleeve	80%	Wet

These two readings show the inside corner of the shower of the partitioned bedroom wall at 24% against 15% outside the shower cubicle, which corresponds with readings on the other side of the wall in the bedroom. There is a leak.

These photos show the moisture differences between the shower tray level and the shower head height. There is no doubt that the shower has a leak, and it has affected the two corner walls where it is fitted, the surrounding floor, and the adjacent main bedroom wall. I suspect it may have affected the ceiling directly below, too. I suggest opening the ceiling below for inspection and/or removing the shower tray and localised floor.

The shower leak affected the Bedroom

The shower leak has, in my opinion, affected the adjacent bedroom wall. In the first photo, we see the typical swelling and shrinkage results of water damage (arrowed). The wall's moisture content also differs as it moves away from the corner. This corresponds to the moisture pattern in the adjacent shower room.



Although not classified as wet the areas are damp and have been affected by water dmage and almost certainly mould growth within this cavity wall

Gymnasium

The bay window's impedance meter moisture content is a concern; however, the strength and absence of visible mould or staining lead me to believe the construction is metal foil-backed plasterboard or cement board, which would provide a false high reading. This should be addressed by an intrusive investigation

Dewpoint Risk

The following photos show wall temperatures and dew point. All are above the Dew Point on the day, and surface condensation and mould are unlikely (except for the shower, which may see moisture in use but not through the dew point).

Specific Humidity

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

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.

Drying wet clothes inside, not using cooking or bathroom exhausts, can add to this moisture loading
The levels were fine, and the shower and kitchen were slightly higher than other rooms due to wet use, as expected.

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

ENVIRIOSCOPE AI assessments

Table 1 – Mould Particulate

Area	Value	Unit	Quartile	RAG	Capped?
Car 2	0	p/m³			
Ambient	4005	p/m³			
Bathroom	8809	p/m³	Q3	Y	
Cycles	7208	p/m³	Q3	Y	
Dining room	1604	p/m³	Q1/Q2	G	
Front room	7194	p/m³	Q1/Q2	G	
Gymnasium	21662	p/m³	Q4	R	Yes
Kitchen	5608	p/m³	Q1/Q2	G	
Sauna bedroom	9640	p/m³	Q4	R	
Top bathroom	12809	p/m³	Q4	R	
Top bedroom	800	p/m³	Q1/Q2	G	

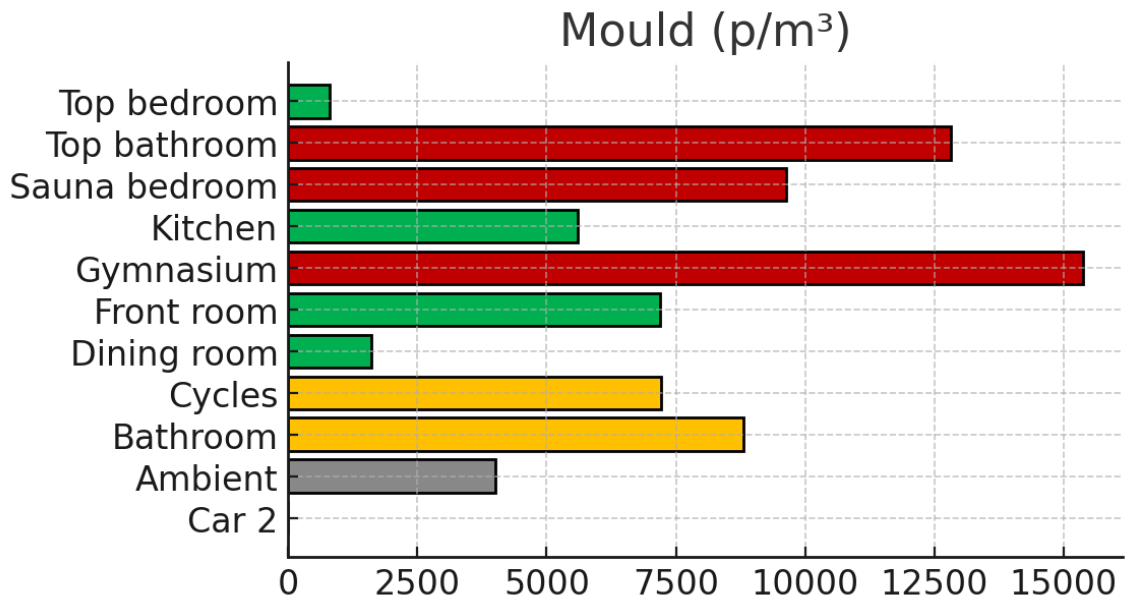


Table 2 – Bacteria/Virus

Area	Value	Unit	Quartile	RAG	Capped?
Car 2	0	p/m³			
Ambient	2403	p/m³			
Bathroom	30431	p/m³	Q4	R	Yes
Cycles	23226	p/m³	Q3	Y	
Dining room	23260	p/m³	Q4	R	
Front room	5595	p/m³	Q1/Q2	G	
Gymnasium	24069	p/m³	Q4	R	
Kitchen	11217	p/m³	Q1/Q2	G	
Sauna bedroom	20084	p/m³	Q3	Y	
Top bathroom	13610	p/m³	Q1/Q2	G	
Top bedroom	5602	p/m³	Q1/Q2	G	

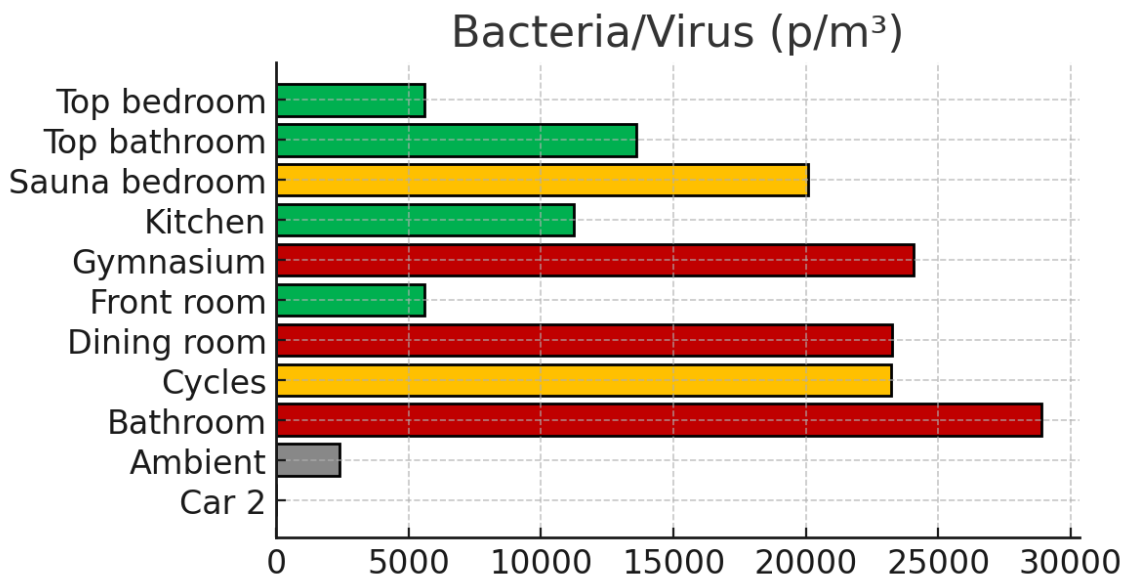


Table 3 – Pollen

Area	Value	Unit	Quartile	RAG	Capped?
Car 2	0	p/m³			
Ambient	0	p/m³			
Bathroom	2402	p/m³	Q4	R	
Cycles	1601	p/m³	Q3	Y	
Dining room	0	p/m³	Q1/Q2	G	
Front room	0	p/m³	Q1/Q2	G	
Gymnasium	2406	p/m³	Q4	R	
Kitchen	3205	p/m³	Q4	R	Yes
Sauna bedroom	0	p/m³	Q1/Q2	G	
Top bathroom	1601	p/m³	Q3	Y	
Top bedroom	0	p/m³	Q1/Q2	G	

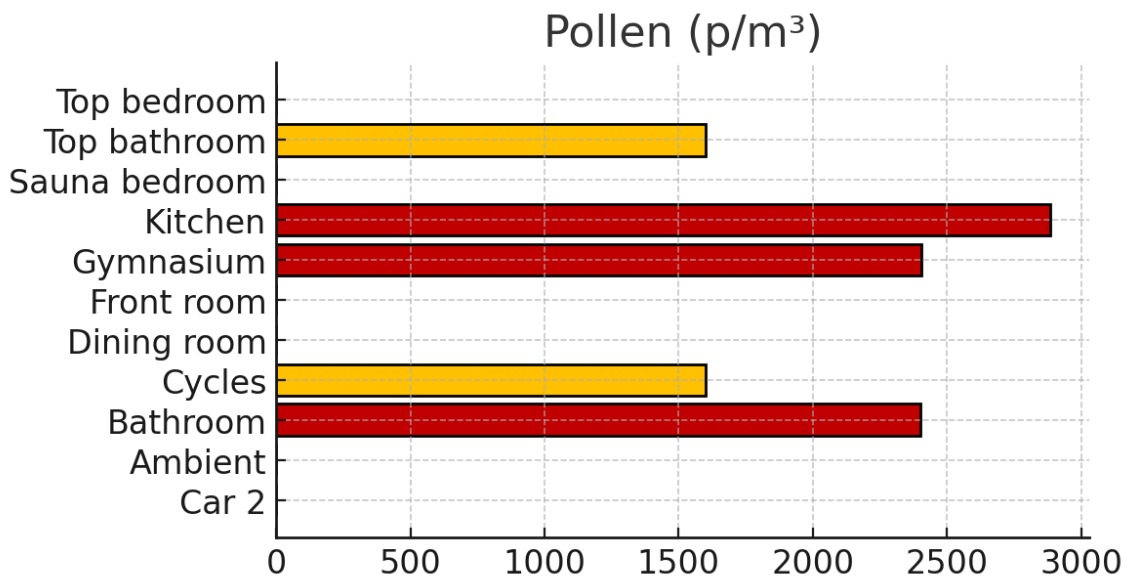


Table 4 – Total Bio

Area	Value	Unit	Quartile	RAG	Capped?
Car 2	0	p/m³			
Ambient	6408	p/m³			
Bathroom	41643	p/m³	Q4	R	
Cycles	32037	p/m³	Q4	R	
Dining room	24865	p/m³	Q1/Q2	G	
Front room	12790	p/m³	Q1/Q2	G	
Gymnasium	48138	p/m³	Q4	R	
Kitchen	20031	p/m³	Q1/Q2	G	
Sauna bedroom	29724	p/m³	Q3	Y	
Top bathroom	28021	p/m³	Q3	Y	
Top bedroom	6402	p/m³	Q1/Q2	G	

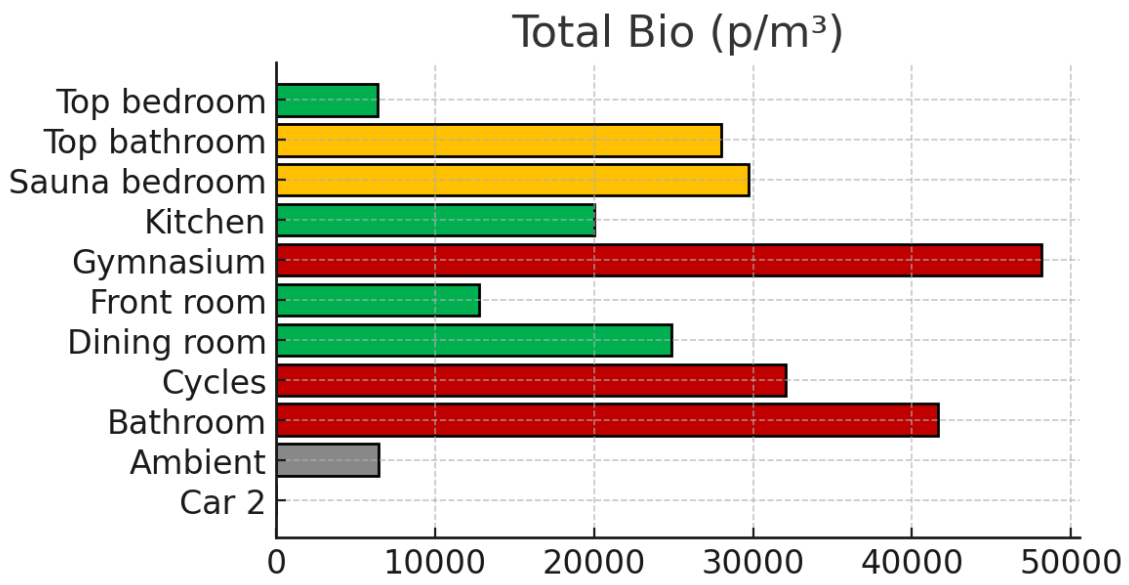


Table 5 – VOCs

Area	Value	Unit	Quartile	RAG	Capped?
Car 2	0	ppb			
Ambient	1161	ppb			
Bathroom	1327	ppb	Q4	R	
Cycles	1243	ppb	Q3	Y	
Dining room	1387	ppb	Q4	R	
Front room	1123	ppb	Q1/Q2	G	
Gymnasium	1065	ppb	Q1/Q2	G	
Kitchen	1077	ppb	Q1/Q2	G	
Sauna bedroom	1332	ppb	Q4	R	
Top bathroom	1256	ppb	Q3	Y	
Top bedroom	1069	ppb	Q1/Q2	G	

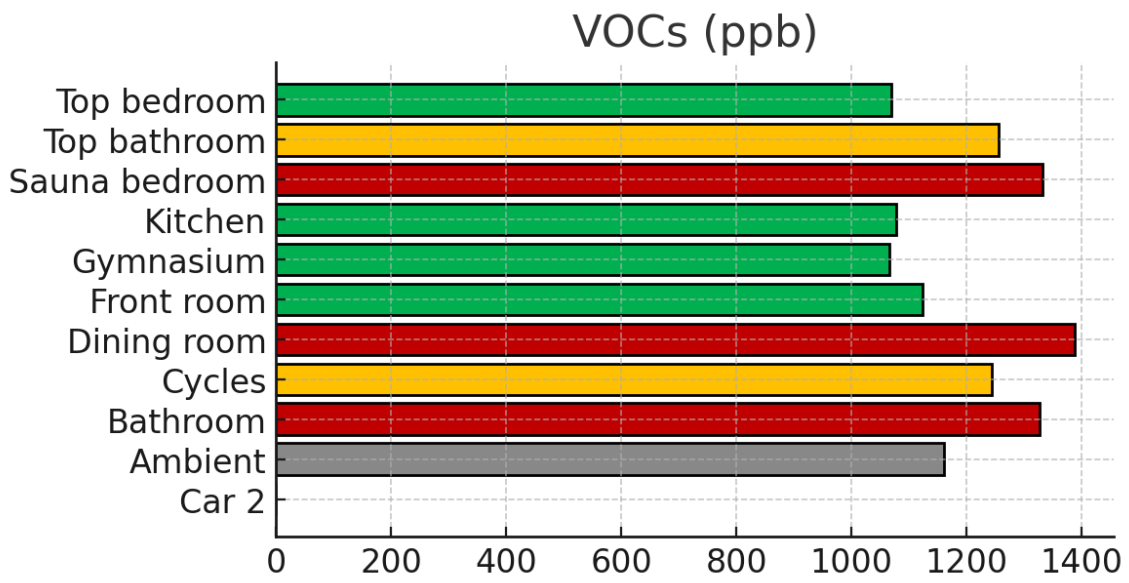


Table 6 – CO_2

Area	Value	Unit	Quartile	RAG	Capped?
Car 2	0	ppm			
Ambient	670	ppm			
Bathroom	1077	ppm	Q4	R	
Cycles	1041	ppm	Q4	R	
Dining room	848	ppm	Q1/Q2	G	
Front room	863	ppm	Q1/Q2	G	
Gymnasium	968	ppm	Q3	Y	
Kitchen	627	ppm	Q1/Q2	G	
Sauna bedroom	980	ppm	Q3	Y	
Top bathroom	1112	ppm	Q4	R	
Top bedroom	780	ppm	Q1/Q2	G	

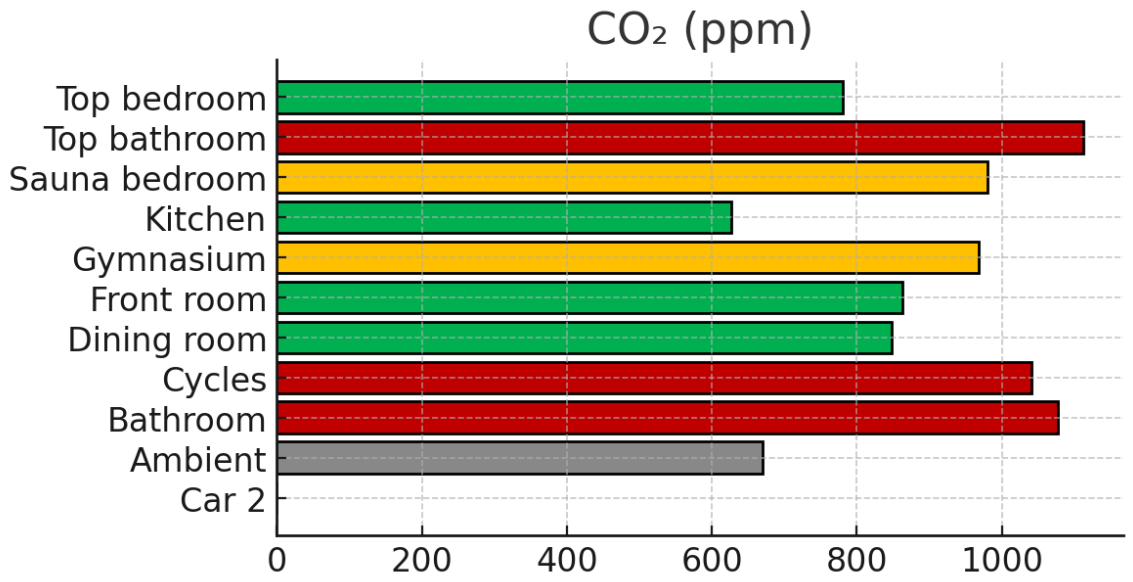
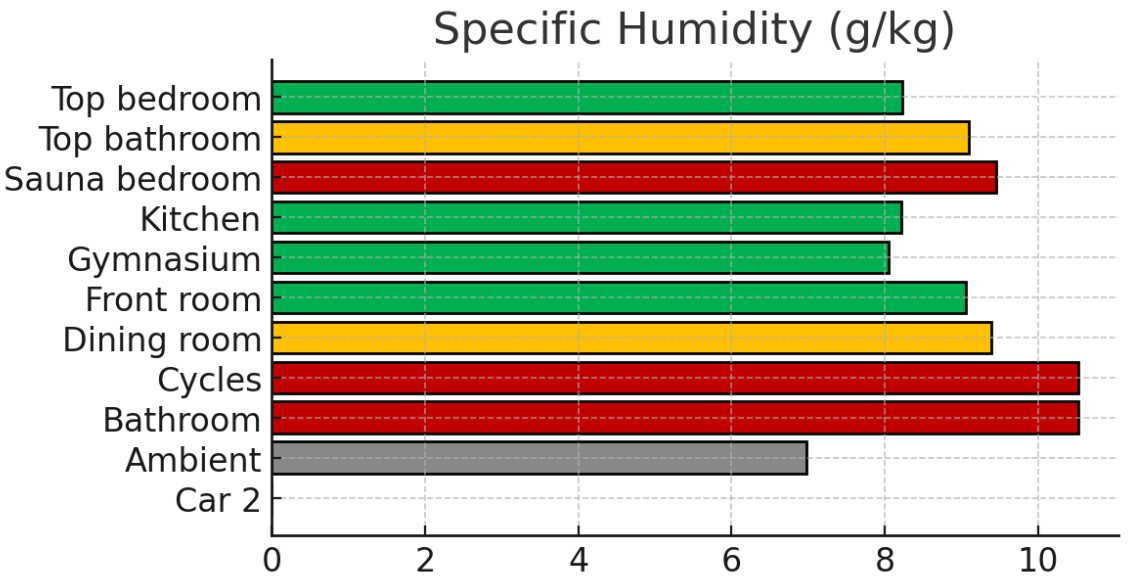


Table 7 – Temperature / RH / Specific Humidity

Area	Value	Unit	Quartile	RAG	Capped?
Car 2	0.0	g/kg			
Ambient	6.97	g/kg			
Bathroom	10.52	g/kg	Q4	R	
Cycles	10.52	g/kg	Q4	R	
Dining room	9.39	g/kg	Q3	Y	
Front room	9.05	g/kg	Q1/Q2	G	
Gymnasium	8.05	g/kg	Q1/Q2	G	
Kitchen	8.21	g/kg	Q1/Q2	G	
Sauna bedroom	9.45	g/kg	Q4	R	
Top bathroom	9.1	g/kg	Q3	Y	
Top bedroom	8.22	g/kg	Q1/Q2	G	


Specific Humidity (g/kg)
Top bedroom
Top bathroom
Sauna bedroom
Kitchen
Gymnasium
Front room
Dining room
Cycles
Bathroom
Ambient
Car 2
0
2
4
6
8
10

Mini Summary – Highest Risk Areas

Table 8 – Top 3 Mould

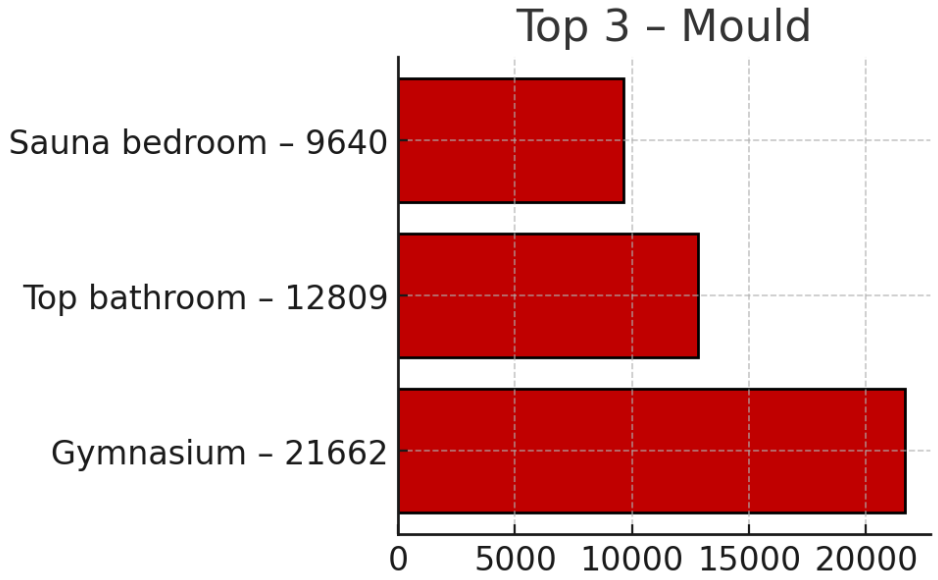


Table 9 – Top 3 Total Bio

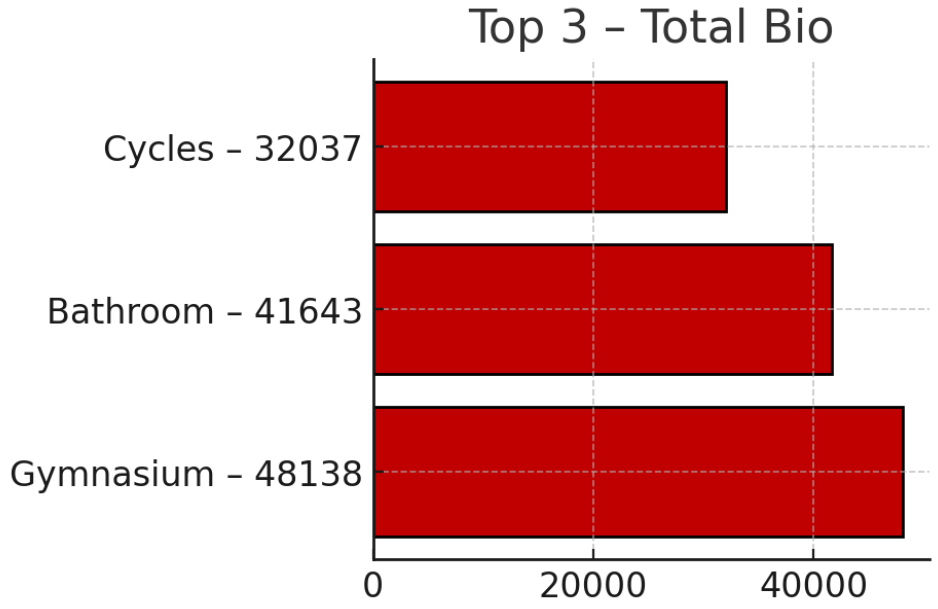
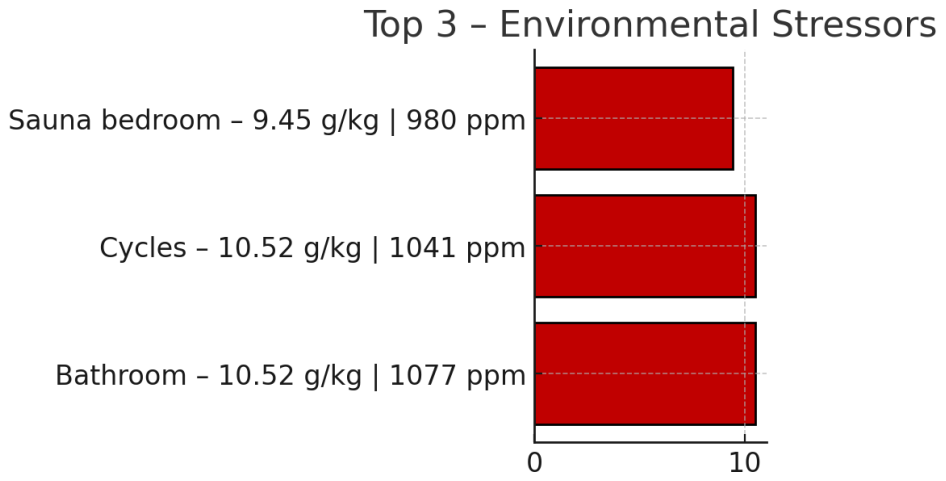


Table 10 – Top 3 Environmental Stressors



Lab reports

- **Total Spore Counts**

The Total Spore Count was taken more to convince the client of the hazards of sauna use, and it was undertaken free of charge.

In this project, we use Penicillium/Aspergillus as a marker for risk under ambient conditions. In Table 1, we see ambient levels at 160 spores, and the house generally averages around 215, except for the gymnasium at double 510 and sauna 4-fold higher at 910 spores per cubic meter.

The sauna room has the highest risk of Cladosporium, and the gymnasium has the second-highest risk from this water-damage indicator.
The sauna also has the highest level of hyphal fragments
The top bedroom was also very heavily contaminated with potentially toxigenic mould.

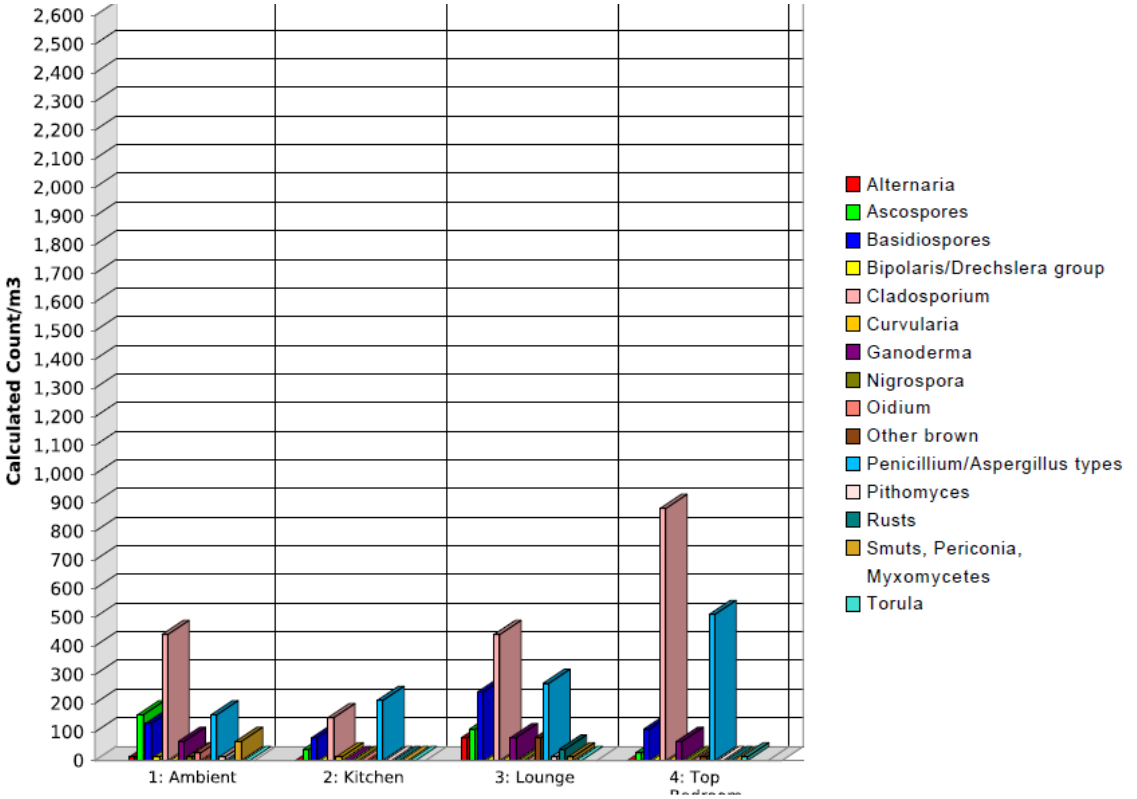
The Dust Swab from the main bedroom is reported separately below the spore count tables.

However, mould is not the major driver of your health issues, and based on this sampling and analysis, bacteria may be the most significant health risk.

Table 1

Sample ID:	20900985-1			20900986-1			20900987-1			20900988-1		
Client Sample ID:	1: Ambient			2: Kitchen			3: Lounge			4: Top Bedroom		
Volume Sampled(L):	75			75			75			75		
Media:	Spore Trap: Cassette			Spore Trap: Cassette			Spore Trap: Cassette			Spore Trap: Cassette		
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	-	-	-	6	80	6	-	-	-
Arthrinium	-	-	-	-	-	-	-	-	-	-	-	-
Ascospores	12	160	14	3	40	8	8	110	8	2	27	2
Penicillium/Aspergillus types	12	160	14	16	210	43	20	270	20	38	510	31
Basidiospores	10	130	12	6	80	16	18	240	18	8	110	7
Bipolaris/Drechslera group	1	13	1	-	-	-	-	-	-	-	-	-
Botrytis	-	-	-	-	-	-	-	-	-	-	-	-
Chaetomium	-	-	-	-	-	-	-	-	-	-	-	-
Cladosporium	33	440	40	11	150	30	33	440	32	66	880	55
Curvularia	-	-	-	1	13	3	-	-	-	-	-	-
Epicoccum	-	-	-	-	-	-	-	-	-	-	-	-
Fusarium	-	-	-	-	-	-	-	-	-	-	-	-
Ganoderma	5	67	6	-	-	-	6	80	6	5	67	4
Memnoniella	-	-	-	-	-	-	-	-	-	-	-	-
Nigrospora	1	13	1	-	-	-	-	-	-	-	-	-
Oidium/Peronospora	-	-	-	-	-	-	-	-	-	-	-	-
Pithomyces	1	13	1	-	-	-	1	13	1	-	-	-
Rusts	-	-	-	-	-	-	3	40	3	-	-	-
Smuts, Periconia, Myxomycetes	5	67	6	-	-	-	1	13	1	-	-	-
Stachybotrys	-	-	-	-	-	-	-	-	-	-	-	-
Torula	-	-	-	-	-	-	-	-	-	1	13	1
Ulocladium	-	-	-	-	-	-	-	-	-	-	-	-
Unidentified spores	-	-	-	-	-	-	-	-	-	-	-	-
Oidium	2	27	2	-	-	-	-	-	-	-	-	-
Other brown	-	-	-	-	-	-	6	80	6	1	13	1
TOTAL spores	83	1,100		37	490		102	1,400		121	1,600	
Hyphal fragments	4	53		1	13		-	-		6	80	
Pollen	3	40		-	-		-	-		-	-	
Background debris	1			3			4			4		
Analytical Sensitivity	< 13			< 13			< 13			< 13		

Sample ID:	20900989-1			20900990-1		
Client Sample ID:	5: Sauna			6: Sauna Bedroom		
Volume Sampled(L):	75			75		
Media:	Spore Trap: Cassette			Spore Trap: Cassette		
Percent of Trace Analyzed:	100% at 600X Magnification			100% at 600X Magnification		
Spore Types	Raw Count	Count/m3	%	Raw Count	Count/m3	%
Alternaria	1	13	< 1	4	53	2
Arthrinium	-	-	-	-	-	-
Ascospores	8	110	3	11	150	4
Penicillium/Aspergillus types	69	920	26	16	210	6
Basidiospores	10	130	4	16	210	6
Bipolaris/Drechslera group	-	-	-	-	-	-
Botrytis	-	-	-	-	-	-
Chaetomium	-	-	-	-	-	-
Cladosporium	174	2,300	65	196	2,600	77
Curvularia	-	-	-	-	-	-
Epicoccum	-	-	-	-	-	-
Fusarium	-	-	-	-	-	-
Ganoderma	1	13	< 1	4	53	2
Memnoniella	-	-	-	-	-	-
Nigrospora	-	-	-	-	-	-
Oidium/Peronospora	-	-	-	-	-	-
Pithomyces	-	-	-	-	-	-
Rusts	-	-	-	-	-	-
Smuts, Periconia, Myxomycetes	1	13	< 1	7	93	3
Stachybotrys	-	-	-	-	-	-
Torula	-	-	-	-	-	-
Ulocladium	-	-	-	-	-	-
Unidentified spores	-	-	-	-	-	-
Oidium	-	-	-	-	-	-
Other brown	2	27	1	-	-	-
TOTAL spores	266	3,500		254	3,400	
Hyphal fragments	-	-		8	110	
Pollen	-	-		-	-	
Background debris	4			4		
Analytical Sensitivity	< 13			< 13		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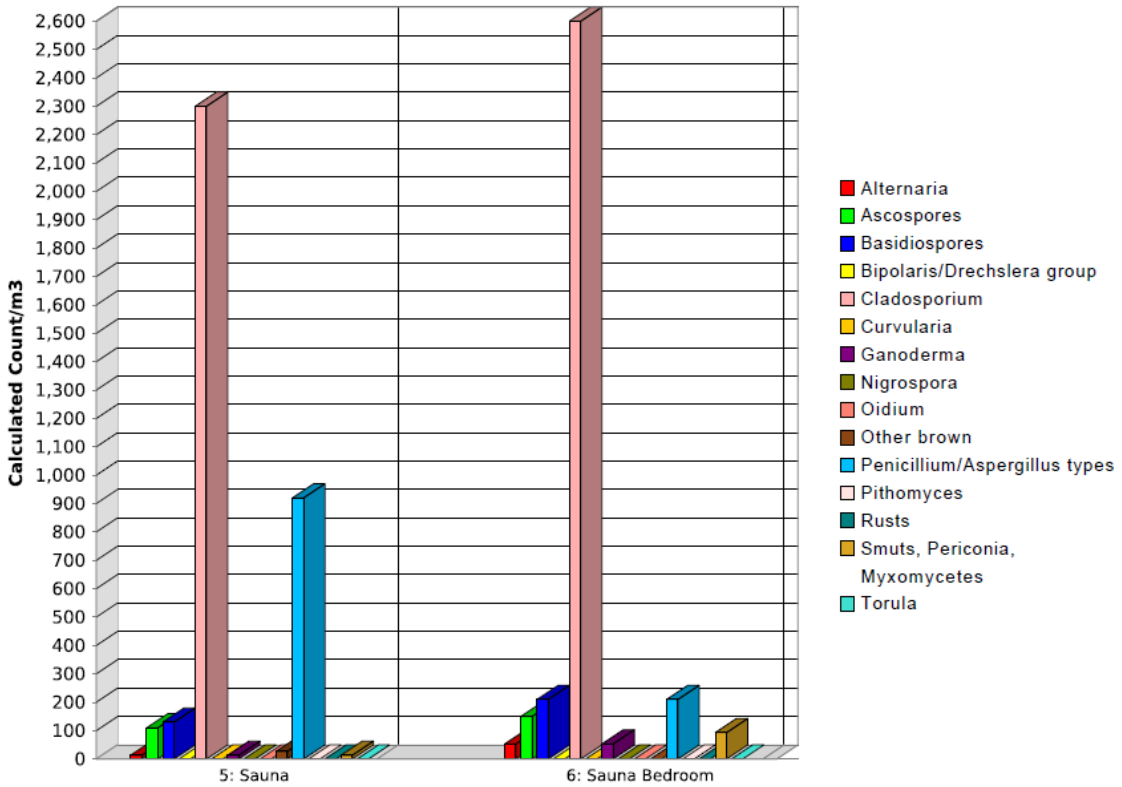
2,500
2,400
2,300
2,200
2,100
2,000
1,900
1,800
1,700
1,600
1,500
1,400
1,300
1,200
1,100
1,000
900
800
700
600
500
400
300
200
100
0
1: Ambient
2: Kitchen
3: Lounge
4: Top
Alternaria
Ascospores
Basidiospores
Bipolaris/Drechslera group
Cladosporium
Curvularia
Ganoderma
Nigrospora
Oidium
Other brown
Penicillium/Aspergillus types
Pithomyces
Rusts
Smuts, Periconia, Myxomycetes
Torula


Calculated Count/m3
2,600
2,500
2,400
2,300
2,200
2,100
2,000
1,900
1,800
1,700
1,600
1,500
1,400
1,300
1,200
1,100
1,000
900
800
700
600
500
400
300
200
100
0
5: Sauna
6: Sauna Bedroom
Alternaria
Ascospores
Basidiospores
Bipolaris/Drechslera group
Cladosporium
Curvularia
Ganoderma
Nigrospora
Oidium
Other brown
Penicillium/Aspergillus types
Pithomyces
Rusts
Smuts, Periconia, Myxomycetes
Torula

- **ERMI – Top Bed**

We have calculated the average levels of over 1000 ERMI scores in the UK. Your score is well below the UK average and might be considered low.
However, four toxigenic mould species are present at ten times the normally expected values, and these can negatively affect the immune system.

Two specific species target your immune response, which can turn off your ability to fight inflammation or disease. The second, also tenfold higher than normal, can cause incurable (but treatable) lung disease.

Group 1: Water Damage Molds			
Species	**SE/mg**	**Level**	**Q**
Aspergillus flavus/oryzae	9		Q3
Aspergillus fumigatus	50	*	Q4
Aspergillus niger	40		Q2
Aspergillus ochraceus	16		Q3
Aspergillus penicillioides	40		Q1
Aspergillus restrictus	5		Q2
Aspergillus sclerotiorum	N.D		Q1
Aspergillus sydowii	N.D		Q1
Aspergillus unguis	N.D		Q1
Aspergillus versicolor	29		Q1
Aureobasidium pullulans	6,006	*	Q4
Chaetomium globosum	N.D		Q1
Cladosporium sphaerospermum	5		Q1
Eurotium (Asp.) amstelodami	357		Q3
Paecilomyces variotii	N.D		Q1
Penicillium brevicompactum	327	*	Q4
Penicillium corylophilum	5		Q1
Penicillium crustosum	26		Q2
Penicillium purpurogenum	N.D		Q1
Penicillium Spinulosum	N.D		Q1
Penicillium variabile	N.D		Q1
Scopulariopsis brevicaulis/fusca	4		Q1
Scopulariopsis chartarum	10		Q3
Stachybotrys chartarum	4		Q2
Trichoderma viride	76	*	Q4
Wallemia sebi	19		Q2
Sum of logs G1		**26.2**	

Group 2: Common Indoor Molds			
Species	SE/mg	Level	Q
Acremonium strictum	104	*	Q4
Alternaria alternata	22		Q2
Aspergillus ustus	N.D		Q1
Cladosporium cladosporioides1	4,222		Q4
Cladosporium cladosporioides2	67		Q3
Cladosporium herbarum	6,121	*	Q4
Epicoccum nigrum	6,771	* *	Q4
Mucor amphibiorum	39		Q3
Penicillium chrysogenum	224		Q4
Rhizopus stolonifer	N.D		Q1
Sum of logs G2		20.4	
Sample Size 3.1 mg	ERMI Results = (G1-G2)	5.9	

Q = Quartile (Q1 Q2 Q3 Q4)

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.

The Geotrichum candidum value was less than 19.5 Ct, indicating that no inhibition was present in the sample.

- **HERTSMI**

The HERTMI 2 score is low and of no concern to you if you have confirmed CIRS

HERTSMI-2 Species	Spore E./mg	Weighting	Q
Aspergillus penicillioides	40	4	Q1
Aspergillus versicolor	29	4	Q1
Chaetomium globosum	N D	0	Q1
Stachybotrys chartarum	4	0	Q2
Wallemia sebi	19	0	Q2
Sample Size 3.1 mg	**HERTSMI-2 Score =**	**8**	

Color-coded interpretation	
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.

- **Endotoxins**

Your Endotoxin score is extremely high, and a major bacterial source from black water or sewer gas is suspected as responsible. Endotoxins can multiply any toxic exposure by adding to the loading on the immune response.

With the ground floor drain and sewer gas known to be issues, I recommend urgent investigation of the sewage system, a possible defect or inadequacy in the stench pipe extension after the loft conversion, and an inoperable Drago valve.

This requires urgent action, and I recommend a qualified plumber or drainage expert.

Reference Number	Locations	Result EU/mg
517039-2	Top Bed	508

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.

EU = Endotoxin Units
mg = Milligrams
CIRS = Chronic Inflammatory Response Syndrome
Q = Quartile (Distribution of Endotoxin on 4,000 USA homes, Q1, Q2, Q3, Q4)

- **Actinos**

Your Gram-positive bacteria counts are all elevated, with many ten times higher than normal, but the real issue is that many are 100-fold higher than normal.

Unfortunately, many of the highest counts are known to be very toxic and have symptoms and organs affected, which are listed further on in the report.

Actino Score Summary	Q & Range
Actino Water Damage Score	Q3
Actino Human Pathogen Score	Q3
Toxic Cyanobacteria Score	Q4

Levels	Actino Score interpretation (Water Damage)
Q 1	Further investigation is not needed to determine the sources.
Q 2	Further investigation may be needed to determine the sources if occupants have been reactive, sensitized, genetically predisposed or otherwise immuno-compromised.
Q 3	
Q 4	Source and cause should be determined and remediation undertaken, reducing - to levels below Q2.

Summary of Total Bacteria Species

	Total Species	Pathogen Species	B.E/mg Total	Q
Bacteria	2,360	164	11,656,350	Q 4
Actino	638	53		

Summary of Bacteria's Order

Orders Detected	Abundance B.E/mg	Families	Abundance	Fold ▲	Diversity	Fold ▲	Pathogen
Actinomycetales	1,659,658	41	29 %	1.2	16.0 %	0.9	53
Bacillales	599,023	14	10 %	0.8	5.4 %	0.8	18
Rhodospirillales	407,780	3	7 %	1.7	1.2 %	0.7	0
Rhodobacterales	256,547	1	4 %	1.7	0.4 %	0.6	0
Clostridiales	218,950	26	4 %	1.2	10.1 %	1.2	25
Cytophagales	205,081	4	4 %	3.6	1.6 %	0.9	0
Rhizobiales	152,166	14	3 %	1.0	5.4 %	1.2	1
Sphingomonadales	146,886	2	3 %	1.9	0.8 %	0.8	0
Deinococcales	120,355	2	2 %	2.9	0.8 %	0.9	0
Spirochaetales	115,735	1	2 %	8.7	0.4 %	0.7	0

▲ = Fold over normal top orders

Table only list 10

B.E = Bacteria Equivalents
B.E/mg = B.E/miligrams of sample

Logs = Logarithms
ND = None Detected
Q1234 = Quartile

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

P = Human Pathogen
C = Comments
E = Elevated

Normal values are based on bacteria distribution in 5,000 US samples. 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

	Species	B.E/mg	C	E	Level	Q
1	Actinomyces gerencseriae	264 P				Q4
2	Actinomyces hongkongensis	660 P				Q4
3	Actinomyces massiliensis	264				Q3
4	Actinomyces nasicola	264				Q4
5	Actinomyces neuii	660 P				Q3
19	Corynebacterium aquatimens	264				Q3
20	Corynebacterium glycinophilum	924				Q4
21	Corynebacterium humireducens	660				Q4
22	Corynebacterium ihumii	1,056	*			Q3
23	Corynebacterium kroppenstedtii	1,056 P				Q3
24	Corynebacterium maris	264				Q3
25	Corynebacterium nasicanis	924	*			Q4
26	Corynebacterium sputi	132				Q3
27	Corynebacterium suicordis	4,619 P	*			Q4
46	Mycobacterium aichiense	264 P				Q3
47	Mycobacterium aubagnense	132				Q4
48	Mycobacterium cookii	264				Q3
49	Mycobacterium hippocampi	264				Q4
50	Mycobacterium hodleri	3,431	*			Q4
51	Mycobacterium holsaticum	132				Q3
52	Mycobacterium iranicum	528				Q3
53	Mycobacterium monacense	264 P				Q4
54	Mycobacterium moriokaense	792	*			Q4
55	Mycobacterium parafortuitum	660				Q4
56	Mycobacterium sediminis	1,056				Q4
57	Mycobacterium sphagni	396				Q4
62	Propionibacterium acidifaciens	132				Q4
63	Propionibacterium acidipropionici	264				Q4
64	Propionibacterium acnes	33,520 P	*			Q3

68	Streptomyces aidingensis	2,507	*		Q4
69	Streptomyces carpaticus	264			Q4
70	Streptomyces flavovirens	528			Q4
71	Streptomyces guanduensis	264			Q4
72	Streptomyces klenkii	660			Q4
73	Streptomyces sulphureus	264			Q4

Other Elevated Species Detected

	Species	B.E/mg	C	E	Level	Q
1	Acetivibrio cellulolyticus	1,056				Q4
2	Acetivibrio ethanolgignens	264	P			Q3
3	Alkaliphilus oremlandii	660				Q4
4	Anaerobacterium chartisolvens	1,848	*			Q4
5	Anaerococcus nagyae	924				Q3
6	Blautia faecis	660	*			Q3
7	Catabacter hongkongensis	1,056	*			Q4
8	Eubacterium coprostanoligenes	528				Q3
9	Garciella nitratireducens	1,848	*			Q4
10	Gracilibacter thermotolerans	2,903	*			Q4
11	Hydrogenispora ethanolica	3,299				Q4
12	Intestinimonas butyriciproducens	132				Q3
13	Pantoea agglomerans	2,243	P *			Q4
14	Pantoea conspicua	660				Q4
15	Pantoea septica	6,730	*			Q4
16	Pantoea vagans	8,842	*			Q4
17	Papillibacter cinnamivorans	132				Q3
18	Pelotomaculum schinkii	528				Q4
19	Proteocatella sphenisci	264				Q3
20	Sporacetigenium mesophilum	1,188				Q4
21	Symbiobacterium terraclitae	924				Q4

Cyanobacteria Species Detected

	Species	B.E/mg	C	E	Level	Q
1	Aerosakkonema funiforme	1,848				Q3
2	Anabaena flosUnclassifiedaquae	3,563	*			Q4
3	Anabaena sp	19,003	*			Q4
4	Aphanizomenon flosUnclassifiedaquae	122,729	* *			Q4
5	Arthrospira sp	132				Q3
6	Brasilonema bromeliae	204,548	* *			Q4
7	Brasilonema terrestre	75,089	* *			Q4
8	Calochaete cimrmanii	264				Q3
9	Calothrix desertica	38,534	*			Q4
10	Calothrix elsteri	9,502	*			Q4
11	Chamaesiphon minutus	23,226	*			Q4
12	Chlorogloeopsis fritschii	264				Q4
13	Chroococcidiopsis thermalis	96,072	* *			Q4
14	Coleofasciculus chthonoplastes	132				Q2
15	Crinalium epipsammum	660				Q4
16	Crocosphaera watsonii	264				Q4
17	Cyanospira rippkae	2,639	*			Q4
18	Cylindrospermum siamensis	3,563	*			Q4
19	Cylindrospermum stagnale	132				Q2
20	Fischerella muscicola	1,056	*			Q4
21	Fischerella thermalis	3,431	*			Q4
22	Gloeothece membranacea	264				Q4
23	Halomicronema excentricum	1,452	*			Q4
24	Halospirulina tapeticola	2,111	*			Q4
25	Hassallia andreassenii	396				Q4
26	Hassallia antarctica	5,147	*			Q4
27	Iphinoe spelaeobios	528				Q4
28	Kastovskya adunca	528				Q4
29	Leptolyngbya foveolarum	396				Q4

30	Loriellopsis cavernicola	1,056			Q4
31	Lyngbya aestuarii	2,903	*		Q4
32	Microcystis aeruginosa	264			Q4
33	Microcystis elabens	132			Q4
34	Myxosarcina sp	2,507	*		Q4
35	Nostoc sp	80,632	* *		Q4
36	Oxynema thaianum	4,091	*		Q4
37	Planktothricoides raciborskii	264			Q3
38	Planktothrix agardhii	396	*		Q4
39	Pleurocapsa sp	1,320	*		Q4
40	Pseudanabaena sp	132			Q4
41	Rivularia sp	528	*		Q4
42	Rubidibacter lacunae	264			Q4
43	Scytonema hofmanni	264			Q2
44	Spirulina sp	264			Q4
45	Synechococcus elongatus	264			Q4
46	Tapinothrix clintonii	264			Q4
47	Tolypothrix sp	132			Q3
48	Trichocoleus desertorum	528			Q4
49	Tychonema bourrellyi	660	*		Q4

Other Human Pathogens

Bacteria Species Found	B.E/mg	E	Level	Q
Salmonella enterica	264	*		Q1
Stenotrophomonas maltophilia	132			Q1

Human Habitat (HH)

Species	B.E/mg	P	Level	Q
Actinomadura chibensis	ND			Q1
Actinomyces canis	132	P		Q1
Actinomyces europaeus	ND			Q1
Actinomyces meyeri	ND			Q1
Actinomyces neuii	660	P		Q3
Actinomyces odontolyticus	132	P		Q1
Actinomyces turicensis	ND			Q1
Corynebacterium accolens	264	P		Q1
Corynebacterium amycolatum	264	P		Q1
Corynebacterium argentoratense	ND			Q1
Corynebacterium coyleae	ND			Q1
Corynebacterium falsenii	396	P		Q1
Corynebacterium glucuronolyticum	132	P		Q1
Corynebacterium hansenii	ND			Q1
Corynebacterium imitans	264	P		Q1
Corynebacterium jeikeium	264	P		Q1
Corynebacterium kroppenstedtii	1,056	P		Q3
Corynebacterium matruchotii	ND			Q1
Corynebacterium minutissimum	ND			Q1
Corynebacterium propinquum	264	P		Q1
Corynebacterium resistens	ND			Q1
Corynebacterium riegelii	132	P		Q1
Corynebacterium simulans	1,056	P	*	Q2
Corynebacterium striatum	ND			Q1
Corynebacterium sundsvallense	ND			Q1
Corynebacterium tuberculostearicum	9,502	P		Q1
Corynebacterium ureicelerivorans	660	P		Q1
Corynebacterium xerosis	ND			Q1
Dermatophilus congolensis	264	P		Q1
Propionibacterium acnes	33,520	P	*	Q3
Propionibacterium avidum	264	P	*	Q1
Propionibacterium granulosum	ND			Q1
Rothia mucilaginosa	3,431	P	*	Q3

Soil Habitat (SH)

Species	B.E/mg	P	Level	Q
Arthrobacter creatinolyticus	132	P		Q1
Arthrobacter crystallopoietes	396	P		Q3
Brevibacterium mcbrellneri	ND			Q1
Brevibacterium paucivorans	ND			Q1
Clavibacter michiganensis	2,903	P	*	Q1
Curtobacterium flaccumfaciens	8,446	P	* *	Q4
Gordonia terrae	264	P		Q1
Nocardia higoensis	ND			Q1
Rathayibacter tritici	ND			Q1
Rhodococcus equi	ND			Q1
Rhodococcus fascians	ND			Q1
Saccharopolyspora rectivirgula	6,598	P	*	Q1
Sanguibacter suarezii	132	P		Q3

ACTINO INDEX TEST RESULTS

Dominance Index (DI)	**1.9**	**Q4**
Prevalence Index (PI)	**0.1**	**Q1**

B.E = Bacteria Equivalents
B.E/mg = B.E/milligrams of sample
ND = None Detected
P = Human Pathogen
Q1234 = Quartile

Level Normal
(*) 10 fold higher than normal.
(**) 100 fold higher than normal.
(***) 1000 fold higher than normal.

Normal values is based on bacteria distribution on 5,000 US samples.

Biological Risk Conclusions

- Actino (Gram-positive, filamentous Actinobacteria) in damp buildings are strongly associated with airway inflammation and hypersensitivity pneumonitis (HP); chronic exposure can drive systemic inflammatory illness and neurocognitive symptoms in susceptible individuals. IMR PressScienceDirectPMC

- Endotoxin (LPS from Gram-negative bacteria) is a potent innate immune trigger (TLR4) that worsens wheeze/asthma, cough, feverish "organic dust toxic syndrome" (ODTS), reduced lung function, and airway hyperreactivity—with effects documented at relatively low airborne levels in homes. Environmental Health PerspectivesPMCOvid

- In CIRS framing, fragments and products from moulds, Actino, mycobacteria and Gram-negative bacteria act as inflammagens; particulate fragments massively outnumber intact spores, amplifying exposure even when culture counts look modest. ≥100× "normal" for Actino or Endotoxin is a RED, immediate-action signal for exposure control and source removal. Surviving Mold

Respirable Mycotoxins

Your initial urine tests showed high levels of zearalenone, a mycotoxin. We undertook air sampling to assess if this was present in your home, and it was confirmed in the following lab results

- While Fusarium is not seen in your PCR panel data, **zearalenone in air samples suggests a hidden Fusarium source** (stored organic materials, or behind finishes).
- It is an endocrine disruptor and can have serious health effects in the endocrine system, affecting the gut, liver, and reproductive system.
- It can produce T2 toxin, which is also present in the ERMI dust, and this chemical can turn off your immune response.
- Exposure may cause early menopause, spontaneous abortion, and infertility
- Lower body weight typically correlates with lower tolerance.

Populations such as individuals with chemical sensitivities, immune-compromised people, infants, and children may have a lower tolerance to airborne mycotoxins.

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Health Implications

Aflatoxins cross the blood-brain barrier, promoting neuroinflammation. They can worsen neurological conditions such as PANS/PANDAS. They also impact liver function and immunity and may contribute to fatigue, headaches, and cognitive disturbances.

CUSTOMER INFORMATION		CHAIN OF CUSTODY	
Customer	Building Forensics	Analyzed Date	7/24/2025
Project	REDACTED	Date of Receipt	7/21/2025
Location			
Telephone	0203 916 5505	Date of Collection	not noted
Email	info@buildingforensics.co.uk	Collected By	Jeff Charlton

DAISEY BED	SAMPLE #	25.07.24-07	RESULTS	LIMIT	ANALYSIS
MYCOTOXIN TEST					
Aflatoxin Total: B1, B2, G1, G2	Air Sample		21.56 ppb	20.00	DETECT
Ochratoxin A	Air Sample		<20.00 ppb	20.00	NON-DETECT
Trichothecene Group: T2,HT2	Air Sample		<250.00 ppb	250.00	NON-DETECT

FRONT LOUNGE	SAMPLE #	25.07.24-08	RESULTS	LIMIT	ANALYSIS
MYCOTOXIN TEST					
Aflatoxin Total: B1, B2, G1, G2	Air Sample		26.35 ppb	20.00	DETECT
Ochratoxin A	Air Sample		<20.00 ppb	20.00	NON-DETECT
Trichothecene Group: T2,HT2	Air Sample		<250.00 ppb	250.00	NON-DETECT

BACK LOUNGE	SAMPLE #	25.07.24-09	RESULTS	LIMIT	ANALYSIS
MYCOTOXIN TEST					
Aflatoxin Total: B1, B2, G1, G2	Air Sample		32.38 ppb	20.00	DETECT
Ochratoxin A	Air Sample		<20.00 ppb	20.00	NON-DETECT
Trichothecene Group: T2,HT2	Air Sample		<250.00 ppb	250.00	NON-DETECT

Respirare Labs analyzes the most commonly observed mycotoxins found within our indoor air and toxicity to humans and animals. The following mycotoxins have not been elevated above limit of detection in the indoor air and are no longer being tested unless requested; Fumonisin, Zearalenone and DON (Vomitoxin).

Lab Comments: Desiree Favreau, Laboratory Manager & Analyst

Add on tests:	Vomitoxin (Don)	NON-DETECT
	Fumonisin	NON-DETECT
	Zearalenone	[redacted] #8 - Front Lounge & #9 - Back Lounge: DETECT

MYCOTOXIN THRESHOLD LEVELS (ppb)

MYCOTOXIN	LOW	MEDIUM	HIGH
Aflatoxin Total: B1, B2, G1, G2	<20.00	20.00 - 30.00	>30.00
Ochratoxin A	<20.00	20.00 - 30.00	>30.00
Trichothecenes: T2|HT2	<250.00	250.00 - 375.00	>375.00

Conclusions

The property is in good condition, but varying improvements may have altered the original environmental conditions.

The highest mould reservoirs were found in the Gymnasium, Sauna, and Top bathroom. But see the Enviroscope report for all details

In my opinion, the master bedroom is the highest health exposure route, with wet walls and ceilings and elevated toxigenic species and bacteria. This may, at first glance, appear to challenge Enviroscope, but as can be seen, this unit splits varying components and is not generic or species-specific, but identifies total exposure.
See pages 46-47-48 for detailed explanations

The two preceding paragraphs are not conflicting statements; the first explains the levels detected, but the second statement recognises the health risk from 8hours of normal sleep next to a mould source.

These sources are confirmed by known water damage to the shower wall, the moisture elevation in the headboard wall, and the suspected mould in the ceiling.

Your Endotoxin Gram-negative bacteria levels are extremely high at 503 units against normal levels of up to 100, and an action triggers a health alert at 200. This may be related to your sewer issue, drainage and serious blackwater leaks.

The extensive plant life has created a major source of mould spores. They must go.

The sauna is another major biological amplification source. The shower leak has caused a major mould risk in your bedroom and adjacent areas and must be remediated.

The main bedroom ceiling is wet and almost certainly is a mould source, and must be investigated. The new roof may not be designed with adequate ventilation

- The front lounge floor has ongoing water damage, which I believe is caused by poor subfloor ventilation.

- The subfloor ventilation must be improved, possibly simply changing to periscope vents

- Historic water damage must be intrusively investigated and perhaps with critical barriers to control any release of spores.

- Because the attic has developed into a roof loft space, I suggest a chartered surveyor or a roofing expert provide guidance regarding roof design, insulation, and ventilation.

- The property is poorly ventilated and has clear water damage areas. The high-risk areas are the Gym, sauna, and top bedroom and top bathroom. Bacteria and mould have increased in these areas.

- The Single swab taken from the bedroom identified a combination of Gram-negative and Gram-positive bacteria with potentially toxigenic mould species, which is a major burden on the immune system.

- The known presence of sewer gas (odour) from a faulty drainage system is a major red flag. Elevated endotoxins found in dust residue in the home associated with sewage or black water amplify this.

Recommended Actions & Verification

- Source identification (moisture, cavities, dehumidifiers, dust reservoirs and sewer gas).

- Targeted remediation with containment and thorough cleaning; avoid biocide-only approaches.

- Post-remediation verification: re-test Actino DNA and endotoxin; confirm reduction below action targets

- Redacted

Appendix

Risk mechanisms & clinical relevance

Actino (Actinomycetes/Actinobacteria)

- Mechanism: small, respirable filaments + cell-wall lipids (e.g., mycolic acids) → Th1/Th17-skewed inflammation, granulomatous responses; classic antigens in HP ("farmer's lung," humidifier exposures). IMR PressScienceDirectPMC

- Likely health effects: subacute/chronic cough, dyspnoea, chest tightness, flu-like episodes, fatigue, and—in susceptible patients—HP and multi-system inflammatory symptoms. In CIRS, Actino is treated as a key non-fungal inflammagen sustaining illness. IMR PressSurviving Mold

Endotoxin (LPS)

- Mechanism: TLR4 activation → cytokine surge (TNF-α, IL-1β, IL-6), airway hyperresponsiveness, fever, malaise. Effects are seen in both occupational and residential studies. OvidPMC

- Likely health effects (residential): increased asthma symptoms and medication use, lower lung function, ODTS-like episodes after disturbance/clean-outs; worse in damp buildings. Environmental Health Perspectivessalud-ambiental.com

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Exposure context & benchmarks (to interpret your data)

- Typical residential airborne endotoxin is reported around ~0.2–0.6 EU/m³ (means in small studies), with dust levels ~tens of EU/mg; values vary by method. No WHO indoor guideline is set, but these provide realistic "background" anchors. salud-ambiental.com

- Occupational health-based proposals for airborne endotoxin span ~50–90 EU/m³ (8-h TWA; Dutch DECOS reports)—orders of magnitude above typical homes and not intended for sensitive populations. healthcouncil.nl+1

- CIRS & WDB context: microbial fragments (mould, Actino, Gram-negatives, mycobacteria) vastly outnumber spores and are inflammagenic; this explains severe symptoms despite modest colony counts and is why fold-elevation vs. normal (your ** and * markers) is more clinically useful than absolute counts alone. Surviving Mold

Interpretation of your " = ≥100× normal" flag**

- For Actino: ≥100× implies an active indoor reservoir (wet materials, dust reservoirs, HVAC, wall voids) with a high HP/CIRS risk—RED.
- For Endotoxin: ≥100× above normal residential background points to substantial Gram-negative amplification or dust disturbance, with high risk of asthma exacerbation/ODTS-like reactions—RED. (If your matrix is air EU/m³, this likely dwarf's typical home levels.) salud-ambiental.com

Typical Organs and health issues: Actinomycetes (possible HP/BRI trigger)

Genitourinary tract, pelvis; Lung, CNS, skin; Lung, pleura, brain (disseminated); Lungs, immune system, nervous system; Oral cavity, cervicofacial tissues; Oral cavity (animal-associated), soft tissue

Interpretation Notes (CIRS-Oriented)

• Actino/Actinobacteria: Associated with inflammatory airway disease, hypersensitivity pneumonitis, and systemic inflammatory responses; in CIRS contexts, can correlate with neurocognitive complaints and fatigue.
• Endotoxin (LPS): Strong innate immune activator (e.g., via TLR4), linked to fever, airway hyperreactivity, reduced lung function, and neuroinflammation.
• ** = 100× Flag: Treat as a priority hazard for exposure reduction, source removal, and verification.