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INFORMEDDECISIONS
MOLD, INDOOR AIR QUALITY & ENVIRONMENTAL SOLUTIONS

March 8, 2021
Assessment & Results Report: Air Quality Testing
Property Assessed: Dharma Centre of Canada – 1267 Galway Rd. Kinmount ON

PROJECT SUMMARY SHEET

Report Title: Air Quality Testing

Project Location: Dharma Centre of Canada – 1267 Galway Rd. Kinmount ON

Report Preparation Date: March 8, 2021

Prepared For: Travis Olsen
Dharma Centre of Canada
1267 Galway Rd. Kinmount ON

Authored By: The Informed Decisions Group

ID Field Consultant: J. Umpleby

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(TS-OACETT #858721, CMI, CIAQC)

Laboratories: **EMSL Analytical**
2756 Slough St.
Mississauga, ON,
A2LA/ILAC; ISO/IEC 17025;2005

Agents Considered: Mold/Fungal Spores, Airborne Bacteria, General IAQ Parameters

Analysis Methods: Analysis of Fungal Spores & Particulates by Optical Microscopy (MICRO-SOP-201, ASTM D7391
Microscopic Examination of Fungal Spores from Tape Lift (EMSL Method MICRO-SOP-200)
Identification & Enumeration of Culturable Bacteria by Air (MICRO-SOP-132)

8 March 2021
Air Quality Testing Results
Property Assessed: Dharma Centre of Canada – 1267 Galway Rd. Kinmount ON

Inspection and Air Sampling

On February 15, 2021, air samples for fungal particulates (Mold) as well as measurement readings for specific indoor air quality parameters were collected from within the property located at 1267 Galway Rd. in Kinmount ON, also known as The Dharma Centre of Canada, in response to a request made by Travis Olsen, who had expressed an interest in having an air quality evaluation performed within the premises.

The scope of the work involved a visual assessment of the facility with representative air sampling for fungal particulates (Mold), measurement readings for TVOC levels, Formaldehyde (CH2O) levels, Carbon Monoxide (CO), Lower Explosive Limits (LEL), Hydrogen Sulfide (H2S), Oxygen (OXY), and Fine Particulate (Dust) Matter. Temperature, Relative Humidity and Carbon Dioxide levels were also collected using a direct reading instrument. An air sample for airborne bacteria levels was also collected for analysis. During the visual assessment of the premises, the presence of possible visible mold was observed within the Pedestal under the stairs, and along the window frames of the Temple above the red windows of the premises. The presence of possible active moisture intrusion/missing insulation/cold spots was observed within Temple (above the red windows), and on the Photo wall beside the sliding glass doors of the facility on the day of testing. A Tape lift sample of the visible mold observed within the Pedestal under the stairs was also collected for direct examination and analysis.

Eight (08) representative air samples were obtained for total fungal particulate analysis from the facility assessed for an indoor air quality evaluation. The air samples were obtained from Outside (1 sample – "Comparison/Control"), Bedroom 1, Bedroom 2, Bedroom 5, Storage Area, Temple-Centre, Temple-Altar Corner, Temple-Pillow Corner areas of the facility. Total fungal particulate air samples were obtained using Air-O-Cell brand Bioaerosol Sampling Cassettes and a calibrated pump. A high volume Zefon Bio-Pump Plus was used for air sampling. Flow rates were 15L/min and were sampled over a five (5) minute interval, for a total of 75L of air. Pumps are calibrated prior to each sampling project. Tape lift samples of the possible visible mold observed on the Pedestal Under the Stairs was also collected for direct examination and analysis.

One (01) Culturable Air Sample for Bacteria was obtained within the Temple area of the facility via a calibrated rotary vane sampling pump and an Andersen N-6 impactor with a Tryptic Soy Agar (TSA) plate. The sample was collected at 15L/min for a 5 minute interval totaling 75L of air. Pumps are calibrated prior to each sampling project.

TVOC (Total Volatile Organic Compounds), CO (Carbon Monoxide), H2S (Hydrogen Sulfide), LEL (Lower Explosive Limits (methane)) and OXY (Oxygen) levels were also obtained from the facility assessed using a RAE Systems MultiRAE personal multigas monitor. The MultiRAE is a compact multi gas monitor that combines a PID (Photoionization Detector) with O2, LEL and two toxic gas sensors (Hydrogen Sulfide, Carbon Monoxide). Calibration and testing of the unit was performed before the air quality sampling project. The MultiRAE unit PID, for TVOC measurement, has a detection limit of 0.1 ppmv (100 ppbv).

Formaldehyde levels were obtained from the facility assessed using an Extech VFM200: VOC/Formaldehyde Meter. The Extech VFM200 measures CH2O/HCHO concentrations in Real Time.

Fine Particulate (Dust) Levels were obtained via a CEM DT-96 3in1 Mini Particle Counter. The DT-96 provides accurate readings for particle counter & particle mass concentrations for PM2.5um and PM10um in ug/m3.

Temperature, Relative Humidity and Carbon Dioxide (CO2) measurements were made using a TSI 7515 Indoor Air Quality Monitor.

Mold and Bacteria samples were analyzed at EMSL, in Mississauga Ontario. EMSL is a nationwide, full service, analytical testing laboratory network providing Asbestos, Mold, Indoor Air Quality, Microbiological, Environmental, Chemical, Forensic, Materials, Industrial Hygiene and Mechanical Testing services since 1981. They are accredited by the American Association for Laboratory Accreditation (A2LA) and participate in the AIHA Environmental Microbiology Proficiency Analytical Testing Program.

Summary of Results:

Air Comfort Guidelines – Temperature and Humidity

Temperature and relative humidity are two of several parameters that affect thermal comfort. Thermal comfort is a state of mind in which a person feels satisfaction with the environment. ASHRAE Standard 55-1992, *Thermal Environmental Conditions for* Human *Occupancy*, presents guidelines that are intended to achieve thermal conditions that at least 80% of the occupants would find acceptable or comfortable wearing a normal amount of clothing. The ASHRAE guidelines for temperature recommend 68 F to 74 F in the winter and 72 F to 80 F in the summer. In most Canadian cities, ideal indoor relative humidity levels are 35% in the winter and 50% in the summer. ASHRAE specifies a range between 25% and 60%. Relative humidity levels at or below 25% are associated with increased discomfort and drying of the mucous membranes and skin, which can lead to chapping and irritation. Low relative humidity also increases static electricity, which causes discomfort and can hinder the operation of computers and paper-processing equipment. High humidity levels can result in condensation within the building structure and on interior or exterior surfaces and the subsequent development of molds and fungi.

Results:

On the day of testing, temperature and relative humidity readings were taken from the facility assessed. The temperature readings were found to be 14.7° Celsius and below the ASHRAE recommended temperature guidelines for ideal indoor air comfort levels. Relative Humidity levels were found to 30.6% and within the ASHRAE recommended guidelines between 25% - 60%.

Indoor Air Quality Guidelines – Carbon Dioxide

Carbon Dioxide is a normal constituent of the atmosphere at 330-350 ppm. Typical levels are in the range of 600-800 ppm. For normal occupancy and activities, this minimum outdoor ventilation rate of 10 L/s per person would result in a carbon dioxide concentration of 850 ppm at steady state conditions in the occupied space. Increasingly, complaints made by occupants of some large buildings are being linked with poor indoor air quality. The occurrence of some of these complaints (headache, fatigue, unpleasant odours, stuffiness and undue warmth) has been associated with elevated concentrations of carbon dioxide. In several studies, comfort factors have been correlated with carbon dioxide concentrations. Collectively, these studies suggest that carbon dioxide concentrations above 1000 ppm are indicative that there is an inadequate supply of fresh air, although complaints have been documented at concentrations as low as 600 ppm. Typically, carbon dioxide levels in excess of 1000 ppm may be an indication of under ventilation.

Results:

The carbon dioxide levels were taken within the facility at time of testing and were found at a concentration of 560 ppm. These concentrations are more ideal than the ASHRAE recommended guidelines (600-800 ppm).

Indoor Air Quality Guidelines – Carbon Monoxide

In office and commercial buildings, important sources of combustion contaminants include tobacco smoke, garages, and loading docks that are attached or have a pathway to working spaces. Air intakes located at ground level or adjacent to vehicles or other combustion sources can transport contaminants to areas served by the air handling system. ASHRAE Standard 62-1989 indicates that the 8-hour average exposure limit for carbon monoxide should not exceed 9 ppm. However, levels above 5 ppm indicate the undesirable presence of combustion pollutants – once located, they should be exhausted. Health & Safety Ontario indicate the legal standard established by the Ontario Ministry of Labour for an 8 hour work day and 40 hour work week is 25 ppm. The Short-Term Exposure Value (15 min.) is 100 ppm.

Results:

At the time of testing, Carbon Monoxide levels were collected from the facility and were found to be 0.0 ppm consistently across all testing events. Health & Safety Ontario "Carbon Monoxide in the Workplace" indicate that these levels are within the Normal range and are below the Short-Term Exposure Value of 100ppm set by the Ontario Ministry of Labour.

Indoor Air Quality Guidelines – Hydrogen Sulfide (H2S)

Hydrogen sulphide (H2S) is a colourless gas with a distinctive odour of rotten eggs. H2S odour perception is highly variable within the human population, ranging from .008-.2ppm. It is flammable in air at concentrations between 4-6% by volume and burns with a pale blue flame. Hydrogen sulphide is a toxic gas and the health hazard depends upon both the duration of exposure and the concentration. The gas is an irritant of the lungs and at low concentrations irritates the eyes and the respiratory tract. Exposure may result in headache, fatigue, dizziness, staggering gait, and diarrhoea. Very large concentrations result in paralysis of the respiratory centre, causing breathing to stop and may potentially lead to death. Typically, odour is considered the limiting factor in setting ambient hydrogen sulphide limits. Odour threshold is set at .01 ppm concentration of H2S. Threshold Limit Value is set at 10 ppm. The minimum concentration of H2S at which human health effects (minor) start is 20 ppm for a short term exposure. The Ontario guideline for H2S concentration is 21 ppb over 1 hr. (health) ambient air quality criteria.

Results:

Hydrogen sulfide levels were collected from the facility and at the time of testing were found to be 0.0 ppm consistently across all testing results.

Indoor Air Quality Guidelines – LEL (Combustible Gas – Methane)

Methane is a chemical compound with the chemical formula CH4. It is the simplest alkane, the main component of natural gas, and probably the most abundant organic compound on earth. The Lower Explosive Limit (LEL) is the lowest concentration (percentage) of a gas or a vapor in air capable of producing a flash of fire in presence of an ignition source. The term is considered to be the same as the lower flammable limit. At a concentration in air lower than the LEL, gas mixtures are "too lean" to burn. Methane gas has a LEL of 5%. If the atmosphere has less than 5% methane, an explosion cannot occur even if a source of ignition is present.

Results:

Combustible Gas (Methane) LEL levels were collected from the facility and at the time of testing was found to be 0% across all testing events.

Indoor Air Quality Guidelines – Oxygen

Oxygen readings are always shown in volume %. Normal oxygen levels are between 19.5% - 23%. Readings below 19.5% indicate the start of a lack of breathable air in the space, while readings above 23.9% indicate a change in the air that the space is now showing levels in the flammable range area which are cause for alarm as this space is now in the danger zone for a possible fire. The ideal oxygen level in our air is 20.9%; this is what nature produces for us outdoors and what we are supposed to breathe in order to be healthy.

Results:

Oxygen levels were collected from the specified areas of the facility and at the time of testing were found to be 20.9% across all testing events considered. These results are indicative of normal indoor oxygen levels.

Indoor Air Quality Guidelines - Total Volatile Organic Compounds

Many VOC's are known to produce sensory irritancy. However, guidance with respect to exposures to individual VOC's only exists for industrial work environments. Very few studies have been conducted to assess sensory irritancy or other health effects that may result from exposures of the general population to substantially lower concentrations of individual VOC's or mixtures of VOC's. At present, there are no Canadian or U.S. standards for TVOC levels in non-industrial indoor environments, target and action units of 1 and 5 mg/ m^3 respectively, are being discussed.

The European Community has prepared a target guideline value for TVOC of 0.3 mg/ m³ (300 ug/m³), where no individual VOC should exceed 10% of the TVOC concentration. Global consensus has resulted in the emergence of preliminary guidelines for TVOC standards for IAQ. Recommended levels range from .1ppm to .65ppm isobutylene units. The European Commission guideline "Indoor Air and its impact on Humans Report 11 Guidelines for Ventilation Requirements in Buildings" classifies exposure level ranges as outlined in the table below:

Total Concentration (ug/m3)	Irritation & Discomfort	Exposure Range
< 200	No irritation or discomfort expected	Comfort Range
200 - 3000	Irritation and discomfort possible if other stressors (uncomfortable lighting, temperature etc.) or exposures interact	Multi-factoral Exposure Range
3,000 – 25,000	Exposure effect and probable headache possible if other exposures interact	Discomfort Range
> 25,000	Additional neurotoxic effects other than head-aches may occur	Toxic Range

The American Industrial Hygiene Association (AIHA) recommends a TVOC exposure threshold limit of 1 ppm in school or office environments. By all accounts, the IAQ TVOC threshold for normal indoor environments should not exceed 1 ppm (1000 ppb) isobutylene units.

The best information available today suggests that low-level VOC exposures can result in adverse health effects such as irritation or inflammation of exposed skin, eyes, and mucous membranes; throat irritation; tearing of the eyes; runny nose; stinging, itching, or tingling feelings in exposed tissues; headache; drowsiness; and various other stress reactions to the exposures.

In general, the research has found that exposures to typical mixtures of VOCs below 1.0 ppm (1,000 ppb) should not result in health effects or significant occupant complaints, exposures in the range of 1 to 10 ppm should be expected to produce some health effects and complaints, and exposures above 10 ppm may produce more serious health effects. Studies suggest that TVOC concentrations below 0.2 mg/m³ (200 ug/m³) would be considered less than the no-effects levels and unlikely to produce irritation and/or discomfort.

To summarize, the Health Canada and European Community target guideline value for indoor air is set at a TVOC level of 0.3 mg/m³ (300 ug/m³) **where no individual VOC should exceed 10%** of the TVOC concentration, while TVOC concentrations below 0.2 mg/m³ (200 ug/m³) would be considered less than the no-effects levels and unlikely to produce irritation and/or discomfort.

Results:

Total volatile organic compound testing was conducted from within the facility. On the day of testing, the levels of TVOC's across all testing events were found to consistently be 0.0 ppmv across all testing events. These levels are indicative of normal indoor air and below both the American Industrial Hygiene Association's recommended exposure threshold limit of 1ppm, as well as the Global consensus guidelines for TVOC levels below 0.65ppm.

Formaldehyde

Formaldehyde is a colourless gas. A pungent odour often indicates its presence at a concentration greater than 0.2ppm. Formaldehyde is present when vapours off-gas from building materials (e.g., carpets, particleboard, fabrics), cleaning fluids, and adhesives. As per Health Canada's "Indoor Air Quality in Office Buildings: A Technical Guide", Indoor concentrations are dependent on the age of the source, ventilation rate, indoor and outdoor temperatures, and humidity.

Formaldehyde concentrations can also vary by as much as 50% from day to day and from season to season. The measured results can be compared with the various guidelines available; typical office levels should be under 0.1 ppm. Formaldehyde is a known irritant and sensitizer. Symptoms include dry or sore throat, nosebleeds, headaches, fatigue, memory and concentration problems, nausea, dizziness, breathlessness, and burning, stinging, and pain in the eyes. Irritant effects have been associated with concentrations in the median range of 0.5ppm and concentrations as low as 0.01 ppm have been reported to affect sensitive individuals. Animal studies indicate that formaldehyde is a carcinogen. The American Conference of Governmental Industrial Hygienists (ACGIH) has identified formaldehyde as a "suspected human carcinogen" and sets a ceiling threshold limit value (TLV-C) of 0.3 ppm.

Results:

The air testing for the presence of formaldehyde conducted within the facility showed testing results which indicate the airborne concentration of formaldehyde to be 0.023 ppm. These results were found to be within typical workplace levels (below 0.1ppm) as specified by Health Canada's "Indoor Air Quality in Office Buildings: A technical Guide", as well as below the ceiling threshold limit value (TLV-C) of 0.3 ppm.

Fine Particulate Levels – (Dust & Respirable Particulates)

Particulates are solid or liquid matter with aerodynamic diameters ranging from 0.005 to 100um. Dusts, fumes, smoke, and organisms such as viruses, pollen grains, bacteria, and fungal spores are solid particulate matter, whereas mists and fog are liquid particulate matter. Indoor particles come from both indoor and outdoor sources and can be drawn into the building via infiltration and outdoor air intakes. The mechanical ventilation system itself may be a source of particulates. The size range of concern to human health and Indoor Air Quality is 0.1-10um. Particles smaller than 0.1um are generally exhaled, and most particles above 10um will be filtered by the nose. Particulates are classified as total suspended particulates (TSP) or respirable suspended particulates (RSP), which consists of those with particle size under 10um. Small particles that reach the thoracic or lower regions of the respiratory tract are responsible for most of the adverse health effects, and guidelines have been developed for those particle 10um or smaller (PM10). Health Canada – Indoor Air Quality in Office Buildings – A Technical Guide, abides by the Environmental Protection Agency PM10 standard of 50ug/m3 for annual exposure and 150ug/m3 for 24-hour exposure. In office buildings, the average particulate concentration of PM10 found in a non-smoking environment is 10ug/m3. In smoking areas, it can range from 30 to 100ug/m3.

Results:

On the day of testing, measurement readings for particulate matter (dust) levels @ PM10 and PM2.5 were collected from the facility and resulted in a concentration of respirable airborne particulate level below the Health Canada Guidelines. Actual Levels of PM2.5 µm were found to be 1 µg/m³, while levels of PM10 µm were found to be 1 µg/m³.

Culturable Air Sampling for Bacteria

Airborne bacteria can be a significant IAQ concern and bacterial cultures provide enumeration and identification of culturable bacteria present in the air. Bacteria are found virtually in every environment. Some heat-loving bacteria thrive best above 176 degrees Fahrenheit, whereas cold-loving bacteria can survive far below 0 degrees Fahrenheit. In indoor environments, bacteria are present in the air and on surfaces. High levels of bacteria concentration indoors is an indication of high occupancy rate, poor ventilation, or poor building maintenance. Similar to mold, some bacteria are associated with water-damaged building materials. While bacteria do not receive as much publicity as mold when it comes to indoor air quality, they are a potential health hazard. Some are serious human pathogens and others, especially the gram negative bacteria, produce toxic compounds (endotoxins) from the outer membrane of their cell wall. Endotoxins may have a role in the development of sick building syndrome.

Although no threshold levels exist, reports and studies indicate that in an indoor environment, airborne bacteria levels below 1000 CFU/m3 can be expected are would generally be considered within a "normal" range.

Results:

On the day of testing, one (01) culturable air sample was collected from the Temple area of the facility for airborne bacteria level analysis. The sample collected from the Temple area of the facility identified that the presence of airborne bacteria was NOT DETECTED within the sample collected for analysis.

Test Report: Identification and Enumeration of Culturable Bacteria by Air (Three Most Prominent Types (EMSL Method MICRO-SOP-132))

Sample Description	Location	Volume (L)	Media	Incubation Temp (C)	Sensitivity (CFU/m³)	Bacteria Identification	Colony Count	CFU/m³
1-475763 *552102492-0001*	Temple	75	TSA	35	13	**None Detected**		

Air Sampling for Fungal Particulates (Mold)

The criteria to reach elevated levels ("ELEVATED") of fungal particulates is when the inside mold spore count of allergenic molds is greater than 2-3X the outside ("COMPARISON"). It should be noted that standard industry practice dictates that **toxigenic molds, such as Stachybotrys (commonly known as "Toxic Black Mold") and Chaetomium, should be absent from indoor air. Even negligible amounts found in indoor air sampling indicate a mold problem within the area which could pose a potential future health risk.**

Results:

The results of the air sampling conducted show **no significantly elevated levels of indoor total fungal particulate concentrations** in any of the air samples collected from the facility. Additionally, the presence of the **toxigenic molds, Stachybotrys and Chaetomium was not detected within the air samples collected**.

No other significant spore levels were found in the air sample collected.

Health Canada does not have any numerical exposure limits for mold. Since people have different sensitivities, it is not possible to establish a "safe" limit for mold as sensitivity levels vary from person to person. Health Canada recommends removing any visible mold found growing indoors and fixing the underlying moisture problem.

Direct Examination for Fungal Particulates (Mold)

The tape lift samples collected for direct examination from within the Pedestal Under the Stairs where visible mold was observed, confirmed mold growth as follows:

Test Report: Microscopic Examination of Fungal Spores, Fungal Structures, Hyphae, and Other Particulates from Tape Samples (EMSL Method MICRO-SOP-200)

Lab Sample Number	Client Sample ID	Location	Fungal Identification	Category
552102402-0009	1	Pedestal under stairs	Alternaria (Ulocladium)	Rare
			Ascospores	Rare
			Aspergillus/Penicillium	Low
			Basidiospores	Rare
			Cladosporium	Rare
			Curvularia	Rare
			Epicoccum	Rare
			Ganoderma	Rare
			Hyphal Fragment	Rare
			Insect Fragment	Rare
			Myxomycetes++	Rare
			Nigrospora	Rare
			Pithomyces++	Rare
			Pollen	Rare

The presence of Alternaria/Ulocladium was detected within the tape lift sample collected for direct examination. Alternaria/Ulocladium has a high water requirement and is not expected to be found in indoors unless there is high moisture. Because of its high water requirements, it is considered an excellent indicator of water damage. When present in indoor air, it is typically found on water damaged building materials such as gypsum board or other cellulose containing materials. Ulocladium has been reported to cause Type 1 (hay fever) allergy.

Ascospores were detected within the tape lift sample collected for direct examination and analysis. Ascospores typically grow well under a variety of conditions and are typically known to be plant pathogens. They are also commonly associated with dead plant materials and fallen leaves. They are commonly found growing indoors on damp substrates.

Aspergillus/Penicillium was detected within the tape lift sample collected for direct examination and analysis. Aspergillus/Penicillium is typically prevalent in water damaged buildings and is found to grow well on a variety of different organic materials and fabrics. It thrives in nutrient rich areas, such as those with moisture issues, or elevated levels of dust. Aspergillus is determined by Health Canada to be type 1 (hay fever and asthma) and type 3 (hypersensitivity) symptom producing and can affect the respiratory system, skin, ear and cornea. This is of greatest significance for people with suppressed immune systems, pre-existing allergies or respiratory weakness. Additionally, this could be of heightened significance, particularly to any individual who is allergic to Penicillin, or have increased sensitivities to mold. The most common mycotoxins produced by Aspergillus are Aflatoxins. The umbrella term aflatoxin refers to four different types of mycotoxins produced, which are B_1, B_2, G_1, and G_2. Aflatoxin B_1, the most toxic, is a potent carcinogen and has been directly correlated to adverse health effects, such as liver cancer, in many animal species.

Basidiospores were found to be present in the tape lift sample collected for direct examination. Indoors, Basidiospores are often found growing on water damaged building materials (chipboard, gypsum board, plywood, wallpaper) and dry rot, wood rot and brown rot are all the result of basidiospores producing fungi. Basidiospores are a contributing factor in structural disintegration and structural damage. Basidiospores are determined by Health Canada to be type 1 (hay fever and asthma) and type 3 (hypersensitivity pneumonitis) symptom producing and have been known to cause cheese washer's lung, woodman's lung, and moldy wall hypersensitivity.

Cladosporium was also found to be present within the tape lift sample collected for direct examination and analysis. In an indoor environment, *Cladosporium* often occur as secondary wall colonizers, typically appearing after the primary ones such as Penicillum species. *Cladosporium* is very common on wet building material (e.g., gypsum board, acrylic painted walls, wood, wallpaper, carpet and mattress dust, HVAC fans, and wet insulation in mechanical cooling units).

The presence of Ganoderma was found to be present in the tape lift sample collected for direct examination. The presence of Ganoderma indoors could mean two possibilities: a) air from outside blew in through an open entryway, thus transporting the spores (If present in outdoor air), or b) the basidiospores were released by an indoor source, signifying the presence of Ganoderma P. on indoor woody plants or worse, on decaying structural wood.

In review of the air sapling lab results (below), the presence of significantly elevated levels of fungal particulates **WAS NOT DETECTED** in any of the air samples collected and all fungal sporadic activity tested appears to be **WITHIN INDUSTRY GUIDELINES AND A "NORMAL"** range**.**

It is however, recommended that MOLD REMEDIATION EFFORTS be performed within the areas of the facility (Pedestal Under the Stairs, and the Temple Window Frames above the Red Windows) where confirmed and possible visible mold was confirmed. Further investigation (visual and/or invasive) is also recommended within any area of the facility where potential moisture intrusion was observed (Temple above Red Windows and on the Photo Wall beside the sliding glass doors).

These recommendations are made in an effort to adhere to the Health Canada guidelines which recommend that any visible mold observed within an indoor environment be properly removed, and any underlying moisture issues resolved. Should visible mold in excess of 10 sq. ft. be observed during further investigation, professional mold remediation efforts are strongly recommended. If choosing a mold remediation provider, several quotes should always be obtained and all credentials verified.

As water damaged building materials are prone to mold growth, there is the potential for mold growth to be present, but not visible or spore releasing at the time of testing, within the areas of the facility where moisture intrusion and/or water damage and staining were observed or on the backside of building materials in which visible mold or sporadic levels of significance were observed. We recommend that only contractors with specific training in mold remediation techniques/equipment should perform mold remediation and/or invasive investigation activities since inadequately trained personnel may seriously exacerbate a non visible mold problem and inadvertently release contained, non airborne spores into the environment.

Furthermore, based on the potentials for exposures to mold growth and release of spores, remediation of mold contaminated, and/or moisture impacted building materials, should generally be performed in accordance with the Canadian Construction Association standard CCA 82 “Mould guidelines for the Canadian Construction Industry – February 2004”, based on the size/scope of the mold uncovered.

In addition, the Environmental Abatement Council of Ontario (EACO), “Mould Abatement Guidelines: Second Edition: 2010”, and the Institute for Inspection, Cleaning, Restoration Certification (IICRC), “S520 Standard and Reference Guide for Professional Mold Remediation, Second Edition: 2008”, should be referenced for the remediation of any visible mold growth uncovered and the investigation and resolution of moisture intrusion/damage issues observed within the facility.

The full extent of potential mold growth present within the areas of the facility where moisture intrusion and/or water damage was observed, (vertically and horizontally within the wall cavities, ceilings, floors, and other inaccessible areas), and in areas with elevated and/or significant sporadic levels were detected, is not known at this time. Mold may be present within these areas but not visible or spore releasing at the time of testing. Further invasive investigation into areas of significant airborne mold spores and mold contamination areas could potentially uncover hidden contaminations, further release spores, and contaminate and/or exacerbate the situation. Efforts should be employed by professionals so that the potential for cross-contamination is minimized during moisture intrusion resolution efforts, mold remediation efforts and invasive investigation efforts. When choosing a remediation provider, quotes should always be obtained and all credentials verified.

The results of this report should be communicated to all parties of concern, and individuals that may enter the residence for investigation, demolition, and renovation purposes. The contractor is required to follow procedures prescribed in applicable legislation.

Yours Truly,
Yvonne Braj, (BSc., CIAQC) For: John Umpleby, (TS-OACETT, CMI, CIAQC)
The Informed Decisions Group of Companies. 1-844-247-8378

Limitations

The investigation, assessments and recommendations detailed in this report were carried out in a manner consistent with the level of care and skill normally exercised by reasonable members of the environmental and industrial hygiene consulting profession currently practicing under similar conditions in the area. There are no other warranties, expressed or implied, that apply to the professional services provided under the terms of our assignment and included in this report.

In preparing this report, The Informed Decisions Group of Companies relied on information supplied by others, including independent testing laboratories. Except as expressly set out in this report, we have not made any independent verification of such information.

The investigation, assessments and recommendations in this report have been made based on conditions observed at the time of the assessment and are limited to the areas investigated. Areas of mold growth may exist in areas not assessed by The Informed Decisions Group of Companies. Mold growth conditions can change with time and mold growth additional to that noted in this report may occur if water infiltration/humidity conditions persist or reoccur. Unaccounted mold growth may also be present in the areas assessed due to concealed or subsurface conditions that can vary from those encountered (if accessed).

The investigation, assessments and recommendations in this report have been made in the context of existing industry accepted guidelines which were in place at the date of this report. The investigation did not take account of any government regulations not in effect or not generally promulgated at the date of this report.

An indoor air quality inspection is not intended to eliminate the uncertainty or the risk of the presence of indoor air quality issues or the adverse effects indoor air quality issues may cause to a building or its occupants.

Unless a thorough air quality investigation/assessment (with all possible testing metrics) is completed, the extent of this report extends to ONLY the type of testing conducted (mold, VOC, asbestos ect.) and is not indicative of the air quality perimeters or activity throughout the remainder of the building or testing means not completed. No comment can be made, and no conclusions can be drawn regarding the air quality or sporadic activity of indoor air quality perimeters not tested or measured.

The Air Quality Inspector (and the Inspection Company) accepts no responsibility for any damages suffered by its client or any third party as a result of this report, or any actions or decisions made from its findings.

Air sampling and direct reading instrument results apply to the time and conditions on the date of testing and cannot be used to reliably predict conditions on other days, past or future.

The liability of the Indoor Air Quality Inspector (and the Inspection Company) arising out of this Inspection and Report, for any cause of action whatsoever, whether in contract or in negligence, is limited to a refund of the fees that you have been charged for this inspection, or the amount of actual damages incurred, whichever is lesser. The Indoor Air Quality Inspector (and the Inspection Company) will not be responsible for any consequential or indirect damages by its client or any associated third party.

Please see below for the laboratory analysis report

February 15, 2021 – 1267 Galway Rd. Kinmount ON – TVOC's, OXY, LEL, H2S, CO

Index	Date/Time	LEL(%LEL)				OXY(%)				H2S(ppm)				CO(ppm)				VOC(ppm)			
					(Real)				(Real)				(Real)				(Real)				(Real)
001	2021-02-15 15:13:29	0	0	0	0	20.9	20.9	20.9	20.9	0.0	0.0	0.0	0.0	0	0	0	0	0.0	0.0	0.0	0.0
002	2021-02-15 15:14:29	0	0	0	0	20.9	20.9	20.9	20.9	0.0	0.0	0.0	0.0	0	0	0	0	0.0	0.0	0.0	0.0
003	2021-02-15 15:15:29	0	0	0	0	20.9	20.9	20.9	20.9	0.0	0.0	0.0	0.0	0	0	0	0	0.0	0.0	0.0	0.0
004	2021-02-15 15:16:29	0	0	0	0	20.9	20.9	20.9	20.9	0.0	0.0	0.0	0.0	0	0	0	0	0.0	0.0	0.0	0.0
005	2021-02-15 15:17:29	0	0	0	0	20.9	20.9	20.9	20.9	0.0	0.0	0.0	0.0	0	0	0	0	0.0	0.0	0.0	0.0
006	2021-02-15 15:18:29	0	0	0	0	20.9	20.9	20.9	20.9	0.0	0.0	0.0	0.0	0	0	0	0	0.0	0.0	0.0	0.0
007	2021-02-15 15:19:29	0	0	0	0	20.9	20.9	20.9	20.9	0.0	0.0	0.0	0.0	0	0	0	0	0.0	0.0	0.0	0.0
008	2021-02-15 15:20:29	0	0	0	0	20.9	20.9	20.9	20.9	0.0	0.0	0.0	0.0	0	0	0	0	0.0	0.0	0.0	0.0
009	2021-02-15 15:21:29	0	0	0	0	20.9	20.9	20.9	20.9	0.0	0.0	0.0	0.0	0	0	0	0	0.0	0.0	0.0	0.0
010	2021-02-15 15:22:29	0	0	0	0	20.9	20.9	20.9	20.9	0.0	0.0	0.0	0.0	0	0	0	0	0.0	0.0	0.0	0.0
011	2021-02-15 15:23:29	0	0	0	0	20.9	20.9	20.9	20.9	0.0	0.0	0.0	0.0	0	0	0	0	0.0	0.0	0.0	0.0
012	2021-02-15 15:24:29	0	0	0	0	20.9	20.9	20.9	20.9	0.0	0.0	0.0	0.0	0	0	0	0	0.0	0.0	0.0	0.0
013	2021-02-15 15:25:29	0	0	0	0	20.9	20.9	20.9	20.9	0.0	0.0	0.0	0.0	0	0	0	0	0.0	0.0	0.0	0.0
014	2021-02-15 15:26:29	0	0	0	0	20.9	20.9	20.9	20.9	0.0	0.0	0.0	0.0	0	0	0	0	0.0	0.0	0.0	0.0
015	2021-02-15 15:27:29	0	0	0	0	20.9	20.9	20.9	20.9	0.0	0.0	0.0	0.0	0	0	0	0	0.0	0.0	0.0	0.0
016	2021-02-15 15:28:29	0	0	0	0	20.9	20.9	20.9	20.9	0.0	0.0	0.0	0.0	0	0	0	0	0.0	0.0	0.0	0.0
017	2021-02-15 15:29:29	0	0	0	0	20.9	20.9	20.9	20.9	0.0	0.0	0.0	0.0	0	0	0	0	0.0	0.0	0.0	0.0
018	2021-02-15 15:30:29	0	0	0	0	20.9	20.9	20.9	20.9	0.0	0.0	0.0	0.0	0	0	0	0	0.0	0.0	0.0	0.0
019	2021-02-15 15:31:29	0	0	0	0	20.9	20.9	20.9	20.9	0.0	0.0	0.0	0.0	0	0	0	0	0.0	0.0	0.0	0.0
020	2021-02-15 15:32:29	0	0	0	0	20.9	20.9	20.9	20.9	0.0	0.0	0.0	0.0	0	0	0	0	0.0	0.0	0.0	0.0
021	2021-02-15 15:33:29	0	0	0	0	20.9	20.9	20.9	20.9	0.0	0.0	0.0	0.0	0	0	0	0	0.0	0.0	0.0	0.0
022	2021-02-15 15:34:29	0	0	0	0	20.9	20.9	20.9	20.9	0.0	0.0	0.0	0.0	0	0	0	0	0.0	0.0	0.0	0.0
023	2021-02-15 15:35:29	0	0	0	0	20.9	20.9	20.9	20.9	0.0	0.0	0.0	0.0	0	0	0	0	0.0	0.0	0.0	0.0
024	2021-02-15 15:36:29	0	0	0	0	20.9	20.9	20.9	20.9	0.0	0.0	0.0	0.0	0	0	0	0	0.0	0.0	0.0	0.0
025	2021-02-15 15:37:29	0	0	0	0	20.9	20.9	20.9	20.9	0.0	0.0	0.0	0.0	0	0	0	0	0.0	0.0	0.0	0.0
026	2021-02-15 15:38:29	0	0	0	0	20.9	20.9	20.9	20.9	0.0	0.0	0.0	0.0	0	0	0	0	0.0	0.0	0.0	0.0
027	2021-02-15 15:39:29	0	0	0	0	20.9	20.9	20.9	20.9	0.0	0.0	0.0	0.0	0	0	0	0	0.0	0.0	0.0	0.0
028	2021-02-15 15:40:29	0	0	0	0	20.9	20.9	20.9	20.9	0.0	0.0	0.0	0.0	0	0	0	0	0.0	0.0	0.0	0.0
029	2021-02-15 15:41:29	0	0	0	0	20.9	20.9	20.9	20.9	0.0	0.0	0.0	0.0	0	0	0	0	0.0	0.0	0.0	0.0
030	2021-02-15 15:42:29	0	0	0	0	20.9	20.9	20.9	20.9	0.0	0.0	0.0	0.0	0	0	0	0	0.0	0.0	0.0	0.0
031	2021-02-15 15:43:29	0	0	0	0	20.9	20.9	20.9	20.9	0.0	0.0	0.0	0.0	0	0	0	0	0.0	0.0	0.0	0.0
032	2021-02-15 15:44:29	0	0	0	0	20.9	20.9	20.9	20.9	0.0	0.0	0.0	0.0	0	0	0	0	0.0	0.0	0.0	0.0
033	2021-02-15 15:45:29	0	0	0	0	20.9	20.9	20.9	20.9	0.0	0.0	0.0	0.0	0	0	0	0	0.0	0.0	0.0	0.0
034	2021-02-15 15:46:29	0	0	0	0	20.9	20.9	20.9	20.9	0.0	0.0	0.0	0.0	0	0	0	0	0.0	0.0	0.0	0.0
035	2021-02-15 15:47:29	0	0	0	0	20.9	20.9	20.9	20.9	0.0	0.0	0.0	0.0	0	0	0	0	0.0	0.0	0.0	0.0
036	2021-02-15 15:48:29	0	0	0	0	20.9	20.9	20.9	20.9	0.0	0.0	0.0	0.0	0	0	0	0	0.0	0.0	0.0	0.0
037	2021-02-15 15:49:29	0	0	0	0	20.9	20.9	20.9	20.9	0.0	0.0	0.0	0.0	0	0	0	0	0.0	0.0	0.0	0.0
038	2021-02-15 15:50:29	0	0	0	0	20.9	20.9	20.9	20.9	0.0	0.0	0.0	0.0	0	0	0	0	0.0	0.0	0.0	0.0
039	2021-02-15 15:51:29	0	0	0	0	20.9	20.9	20.9	20.9	0.0	0.0	0.0	0.0	0	0	0	0	0.0	0.0	0.0	0.0
040	2021-02-15 15:52:29	0	0	0	0	20.9	20.9	20.9	20.9	0.0	0.0	0.0	0.0	0	0	0	0	0.0	0.0	0.0	0.0
041	2021-02-15 15:53:29	0	0	0	0	20.9	20.9	20.9	20.9	0.0	0.0	0.0	0.0	0	0	0	0	0.0	0.0	0.0	0.0
Peak		0	0	0	0	20.9	20.9	20.9	20.9	0.0	0.0	0.0	0.0	0	0	0	0	0.0	0.0	0.0	0.0
Min		0	0	0	0	20.9	20.9	20.9	20.9	0.0	0.0	0.0	0.0	0	0	0	0	0.0	0.0	0.0	0.0
Average		0	0	0	0	20.9	20.9	20.9	20.9	0.0	0.0	0.0	0.0	0	0	0	0	0.0	0.0	0.0	0.0

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http://www.EMSL.com torontolab@emsl.com

EMSL Canada Or	552102492
CustomerID:	55IDCP25
CustomerPO:	1267
ProjectID:	

Attn: **Yvonne Braj**
Informed Decisions Group of Companies
5-5622 Ironwood St
Niagara Falls, ON L2H 0M5

Phone:	(647) 286-0193
Fax:	
Received:	2/19/2021 01:39 PM
Analysis Date:	3/1/2021
Collected:	2/15/2021

Project: **1267 Galway Rd, Kinmount, ON**

Test Report: Identification and Enumeration of Culturable Bacteria by Air (Three Most Prominent Types (EMSL Method MICRO-SOP-132))

Sample Description	Location	Volume (L)	Media	Incubation Temp (C)	Sensitivity (CFU/m³)	Bacteria Identification	Colony Count	CFU/m³
1-475763	Temple	75	TSA	35	13	**None Detected**		
552102492-0001								

No discernable blank was submitted with this group of samples.

Analyst(s)

Stefan Lopez (1)

Sneha Panchal, M.Sc.,RMCCM Laboratory Manager
or other approved signatory

Initial report from 03/04/2021 13:46:43

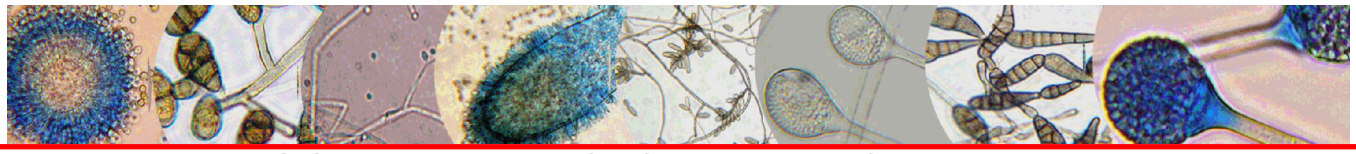
EXPANDED FUNGAL REPORT ™

Prepared Exclusively For

Informed Decisions Group of Companies

5-5622 Ironwood St
Niagara Falls, ON L2H 0M5
Phone:647-286-0193

Report Date:	**2/23/2021**
Project:	**1267 Galway Rd, Kinmount**
P.O:	**1267**
EMSL Canada Orde	**552102402**



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Attn: Yvonne Braj
Informed Decisions Group of Companies
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Niagara Falls, ON L2H 0M5

EMSL Order:	552102402
Customer ID:	55IDCP25
Collected:	2/15/2021
Received:	2/18/2021
Analyzed:	2/23/2021

Proj: 1267 Galway Rd, Kinmount

1. Description of Analysis

Analytical Laboratory

EMSL Canada Inc. (EMSL Canada) is a nationwide, full service, analytical testing laboratory network providing Asbestos, Mold, Indoor Air Quality, Microbiological, Environmental, Chemical, Forensic, Materials, Industrial Hygiene and Mechanical Testing services. Ranked as the premier independently owned environmental testing laboratory in the nation, EMSL Canada puts analytical quality as its top priority. This is assured by our high quality personnel, including experienced microbiologists with graduate degrees. Our quality is recognized by many well-respected federal, provincial and private accrediting agencies, such as the American Association for Laboratory Accreditation (A2LA). A2LA is a nonprofit, non-governmental, public service, membership society providing laboratory accreditation based on internationally accepted criteria for competence (ISO/IEC 17025). A2LA accreditation is also recognized internationally through its membership with the International Laboratory Accreditation Cooperation (ILAC).

EMSL Canada is an independent laboratory that performed the analysis of these samples. EMSL Canada did not conduct the sampling or site investigation for this report. The samples referenced herein were analyzed under strict quality control procedures using state-of-the-art microbiological methods. The analytical methods used and the data presented are scientifically and legally defensible

The laboratory data is provided in compliance with A2LA accreditation and the ISO 17025 standard for the particular test(s) requested, including any associated limitations for the methods employed. These data are intended for use by professionals having knowledge of the testing methods necessary to interpret them accurately.

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Attn: Yvonne Braj
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Niagara Falls, ON L2H 0M5

EMSL Order: 552102402
Customer ID: 55IDCP25
Collected: 2/15/2021
Received: 2/18/2021
Analyzed: 2/23/2021

Proj: 1267 Galway Rd, Kinmount

Air Samples - Spore traps:

Spore traps are commercially available sampling devices that capture airborne particles on an adhesive slide. Air is pulled through the device using a vacuum pump. Spores, as well as other airborne particles, are impacted on the collection adhesive. Using spore trap collection methods has inherent limitations. These collection methods are biased towards larger spore sizes.

The analysis for total spore counts is a direct microscopic examination and does not include culturing or growing the fungi. Therefore, the results include both viable and non-viable spores. Some fungal groups produce similar spore types that cannot be distinguished by direct microscopic examination alone (i.e., *Aspergillus/Penicillium*, and others). Other spore types may lack distinguishing features that aid in their identification. These types are grouped into larger categories such as Ascospores or Basidiospores.

Fungal spores are identified and grouped by morphological characteristics including color, shape, septation, ornamentation, and fruiting structures (if present) which are compared to published mycological identification keys and texts. EMSL Canada reports provide spore counts per cubic meter of air to three significant figures. Please note that each spore category is reported to three significant figures. Due to rounding and the application of three significant figures the sum of the individual spore numbers may not equal the total spore count on the report. EMSL Canada does not maintain responsibility for final volume concentrations (counts/m3) since this volume is provided by the field collector and can not be verified by EMSL Canada.

EMSL Canada analyzes spore traps using phase contrast microscopy. There is a wide choice of collection devices (Air-O-Cell, Micro-5, Burkhard, etc.) on the market. Differences in analytical method may exist between spore trap devices.

Spore trap results are reported in spores per cubic meter of air. Due to the other airborne particles collected with the spores, EMSL Canada reports a background particle density. Background density is an indication of overall particulate matter present on the sample (i.e. dust in the air). High background concentrations may obscure spores such as the *Penicillium*/*Aspergillus* group. The rating system is from 1-5 with 1 = 1 - 25% of the background obscured by material, 2 = 26 - 50%, 3 = 51 - 75%, 4 = 76% - 99%, 5 = 100% or overloaded. A background rating of 4 or higher should be regarded as a minimum count since the actual concentrations may be higher than those reported. EMSL Canada will not be held responsible for overloading of samples. Sample volumes are left to the discretion of the company or persons conducting the fieldwork.

Skin fragment density is the percentage of skin cells making up the total background material, 1 = 1 - 25%, 2 = 26 - 50%, 3 = 51 - 75%, 4 = 76-100%. Skin fragment density is considered an indication of the general cleanliness in the area sampled. It has been estimated that up to 90% of household dust consists of dead skin cells.

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Niagara Falls, ON L2H 0M5

Proj: 1267 Galway Rd, Kinmount

EMSL Order:	552102402
Customer ID:	55IDCP25
Collected:	2/15/2021
Received:	2/18/2021
Analyzed:	2/23/2021

2. Analytical Results

See attached data reports and charts.

EMSL Canada Inc.

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Attn: Yvonne Braj
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Niagara Falls, ON L2H 0M5

EMSL Order: 552102402
Customer ID: 55IDCP25
Collected: 2/15/2021
Received: 2/18/2021
Analyzed: 2/23/2021

Proj: 1267 Galway Rd, Kinmount

Test Report: Air-O-Cell(™) Analysis of Fungal Spores & Particulates by Optical Microscopy (Methods MICRO-SOP-201, ASTM D7391)

Lab Sample Number:	552102402-0001			552102402-0002			552102402-0003		
Client Sample ID:	3197 2692			3197 2651			3197 2716		
Volume (L):	75			75			75		
Sample Location:	Outside			Bedroom 1			Bedroom 2		
Spore Types	Raw Count	Count/m³	% of Total	Raw Count	Count/m³	% of Total	Raw Count	Count/m³	% of Total
Alternaria (Ulocladium)	-	-	-	-	-	-	-	-	-
Ascospores	-	-	-	-	-	-	1	40	15.4
Aspergillus/Penicillium	2	90	69.2	6	300	71.4	1	40	15.4
Basidiospores	-	-	-	1	40	9.5	1	40	15.4
Bipolaris++	-	-	-	-	-	-	-	-	-
Chaetomium	-	-	-	-	-	-	-	-	-
Cladosporium	-	-	-	1	40	9.5	2	90	34.6
Curvularia	-	-	-	-	-	-	-	-	-
Epicoccum	-	-	-	-	-	-	-	-	-
Fusarium	-	-	-	-	-	-	-	-	-
Ganoderma	-	-	-	-	-	-	-	-	-
Myxomycetes++	-	-	-	-	-	-	1	40	15.4
Pithomyces++	-	-	-	-	-	-	-	-	-
Rust	-	-	-	-	-	-	-	-	-
Scopulariopsis/Microascus	-	-	-	-	-	-	-	-	-
Stachybotrys/Memnoniella	-	-	-	-	-	-	-	-	-
Unidentifiable Spores	1	40	30.8	1	40	9.5	1*	10*	3.8
Zygomycetes	-	-	-	-	-	-	-	-	-
Total Fungi	**3**	**130**	**100**	**9**	**420**	**100**	**7**	**260**	**100**
Hyphal Fragment	-	-	-	1	40	-	1	40	-
Insect Fragment	-	-	-	-	-	-	-	-	-
Pollen	-	-	-	-	-	-	-	-	-
Analyt. Sensitivity 600x	-	43	-	-	43	-	-	43	-
Analyt. Sensitivity 300x	-	13*	-	-	13*	-	-	13*	-
Skin Fragments (1-4)	-	1	-	-	2	-	-	1	-
Fibrous Particulate (1-4)	-	1	-	-	1	-	-	1	-
Background (1-5)	-	1	-	-	2	-	-	2	-

++ Includes other spores with similar morphology; see EMSL's fungal glossary for each specific category.

No discernable field blank was submitted with this group of samples.

Sneha Panchal, M.Sc.,RMCCM Laboratory Manager

Initial report from: 02/23/2021 16:21:17

EMSL Canada Inc.

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Niagara Falls, ON L2H 0M5

EMSL Order: 552102402
Customer ID: 55IDCP25
Collected: 2/15/2021
Received: 2/18/2021
Analyzed: 2/23/2021

Proj: 1267 Galway Rd, Kinmount

Test Report: Air-O-Cell(™) Analysis of Fungal Spores & Particulates by Optical Microscopy (Methods MICRO-SOP-201, ASTM D7391)

Lab Sample Number:	552102402-0004			552102402-0005			552102402-0006		
Client Sample ID:	3197 2732			3197 2698			3197 2753		
Volume (L):	75			75			75		
Sample Location:	Bedroom 5			Storage Area			Temple - Center		
Spore Types	Raw Count	Count/m³	% of Total	Raw Count	Count/m³	% of Total	Raw Count	Count/m³	% of Total
Alternaria (Ulocladium)	-	-	-	-	-	-	-	-	-
Ascospores	-	-	-	-	-	-	1*	10*	8.3
Aspergillus/Penicillium	3	100	90.9	-	-	-	3	100	83.3
Basidiospores	1*	10*	9.1	-	-	-	1*	10*	8.3
Bipolaris++	-	-	-	-	-	-	-	-	-
Chaetomium	-	-	-	-	-	-	-	-	-
Cladosporium	-	-	-	-	-	-	-	-	-
Curvularia	-	-	-	-	-	-	-	-	-
Epicoccum	-	-	-	-	-	-	-	-	-
Fusarium	-	-	-	-	-	-	-	-	-
Ganoderma	-	-	-	-	-	-	-	-	-
Myxomycetes++	-	-	-	-	-	-	-	-	-
Pithomyces++	-	-	-	1	40	100	-	-	-
Rust	-	-	-	-	-	-	-	-	-
Scopulariopsis/Microascus	-	-	-	-	-	-	-	-	-
Stachybotrys/Memnoniella	-	-	-	-	-	-	-	-	-
Unidentifiable Spores	-	-	-	-	-	-	-	-	-
Zygomycetes	-	-	-	-	-	-	-	-	-
Total Fungi	**4**	**110**	**100**	**1**	**40**	**100**	**5**	**120**	**100**
Hyphal Fragment	-	-	-	1*	10*	-	-	-	-
Insect Fragment	-	-	-	-	-	-	-	-	-
Pollen	-	-	-	-	-	-	-	-	-
Analyt. Sensitivity 600x	-	43	-	-	43	-	-	43	-
Analyt. Sensitivity 300x	-	13*	-	-	13*	-	-	13*	-
Skin Fragments (1-4)	-	2	-	-	2	-	-	1	-
Fibrous Particulate (1-4)	-	1	-	-	1	-	-	1	-
Background (1-5)	-	2	-	-	2	-	-	2	-

++ Includes other spores with similar morphology; see EMSL's fungal glossary for each specific category.

No discernable field blank was submitted with this group of samples.

Sneha Panchal, M.Sc.,RMCCM Laboratory Manager

Initial report from: 02/23/2021 16:21:17

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Niagara Falls, ON L2H 0M5

EMSL Order: 552102402
Customer ID: 55IDCP25
Collected: 2/15/2021
Received: 2/18/2021
Analyzed: 2/23/2021

Proj: 1267 Galway Rd, Kinmount

Test Report: Air-O-Cell(™) Analysis of Fungal Spores & Particulates by Optical Microscopy (Methods MICRO-SOP-201, ASTM D7391)

Lab Sample Number:	552102402-0007			552102402-0008		
Client Sample ID:	3197 2700			3197 2756		
Volume (L):	75			75		
Sample Location:	Temple - Altar corner			Temple - Pillow corner		
Spore Types	Raw Count	Count/m³	% of Total	Raw Count	Count/m³	% of Total
Alternaria (Ulocladium)	-	-	-	-	-	-
Ascospores	-	-	-	-	-	-
Aspergillus/Penicillium	1	40	50	2	90	69.2
Basidiospores	-	-	-	-	-	-
Bipolaris++	-	-	-	-	-	-
Chaetomium	-	-	-	-	-	-
Cladosporium	1	40	50	1	40	30.8
Curvularia	-	-	-	-	-	-
Epicoccum	-	-	-	-	-	-
Fusarium	-	-	-	-	-	-
Ganoderma	-	-	-	-	-	-
Myxomycetes++	-	-	-	-	-	-
Pithomyces++	-	-	-	-	-	-
Rust	-	-	-	-	-	-
Scopulariopsis/Microascus	-	-	-	-	-	-
Stachybotrys/Memnoniella	-	-	-	-	-	-
Unidentifiable Spores	-	-	-	-	-	-
Zygomycetes	-	-	-	-	-	-
Total Fungi	**2**	**80**	**100**	**3**	**130**	**100**
Hyphal Fragment	-	-	-	-	-	-
Insect Fragment	-	-	-	-	-	-
Pollen	-	-	-	-	-	-
Analyt. Sensitivity 600x	-	43	-	-	43	-
Analyt. Sensitivity 300x	-	13*	-	-	13*	-
Skin Fragments (1-4)	-	1	-	-	2	-
Fibrous Particulate (1-4)	-	1	-	-	1	-
Background (1-5)	-	2	-	-	2	-

++ Includes other spores with similar morphology; see EMSL's fungal glossary for each specific category.

No discernable field blank was submitted with this group of samples.

Sneha Panchal, M.Sc.,RMCCM Laboratory Manager

Initial report from: 02/23/2021 16:21:17

EMSL Canada Inc.

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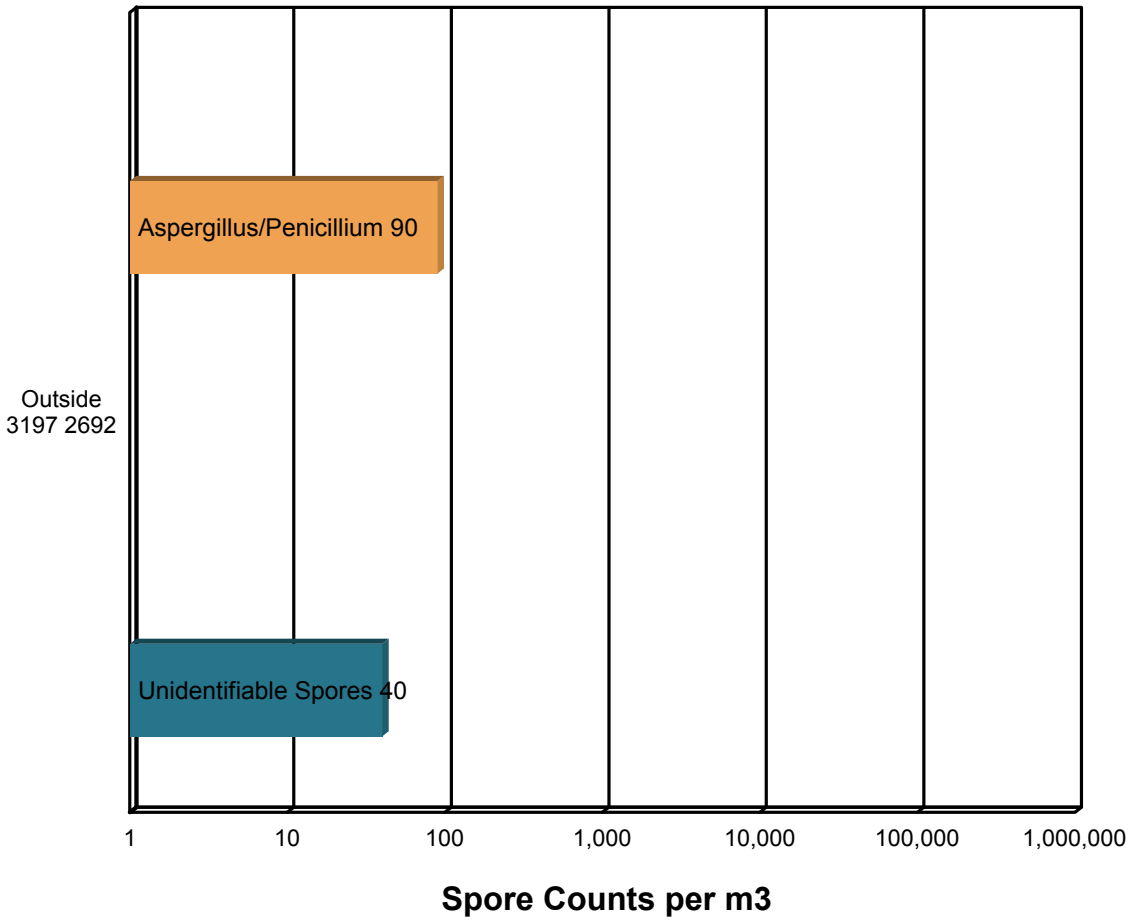
Attn: Yvonne Braj
Informed Decisions Group of Companies
5-5622 Ironwood St
Niagara Falls, ON L2H 0M5

EMSL Order:	552102402
Customer ID:	55IDCP25
Collected:	2/15/2021
Received:	2/18/2021
Analyzed:	2/23/2021

Proj: 1267 Galway Rd, Kinmount

Spore Trap Report: Total Counts



Ascospores
Aspergillus/Penicillium
Basidiospores
Cladosporium
Myxomycetes++
Pithomyces++
Unidentifiable Spores

* The chart is displayed using a logarithmic scale. Bar size is not directly proportional to the number of spores.

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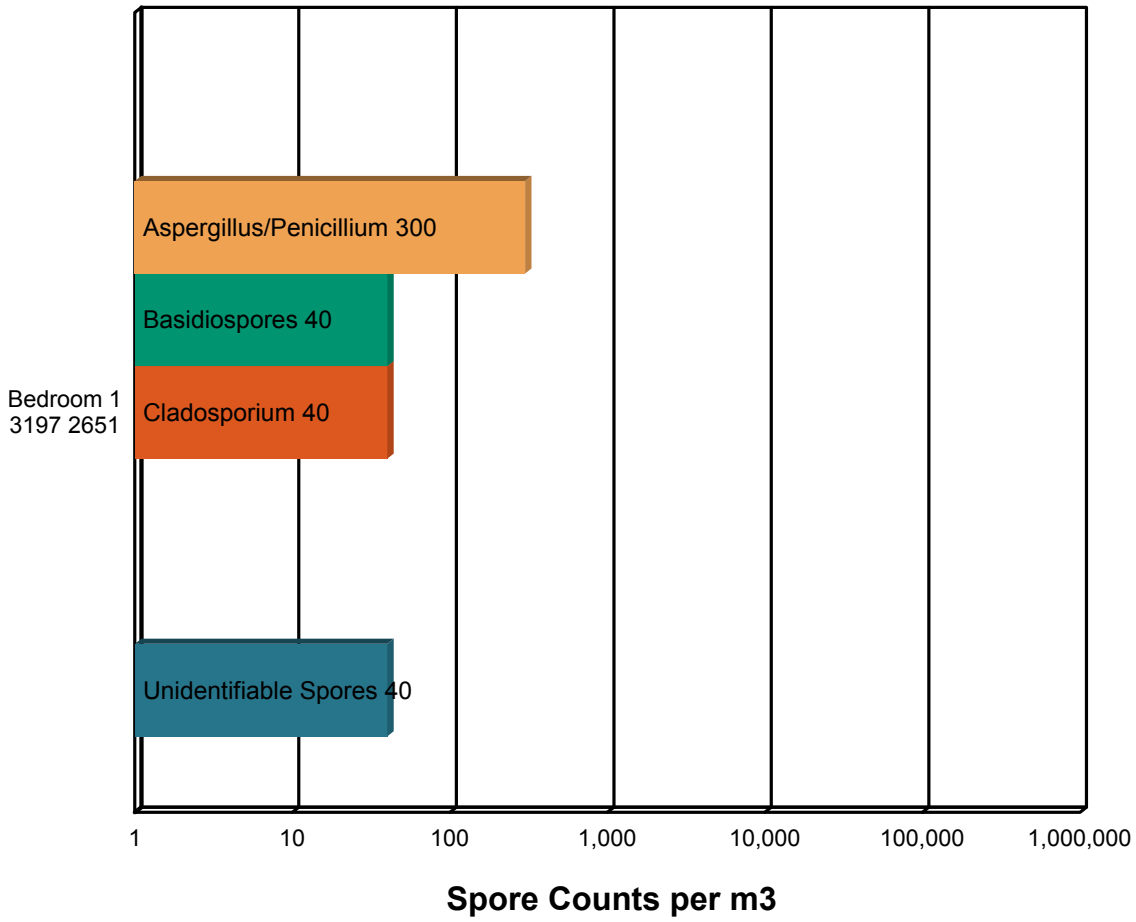

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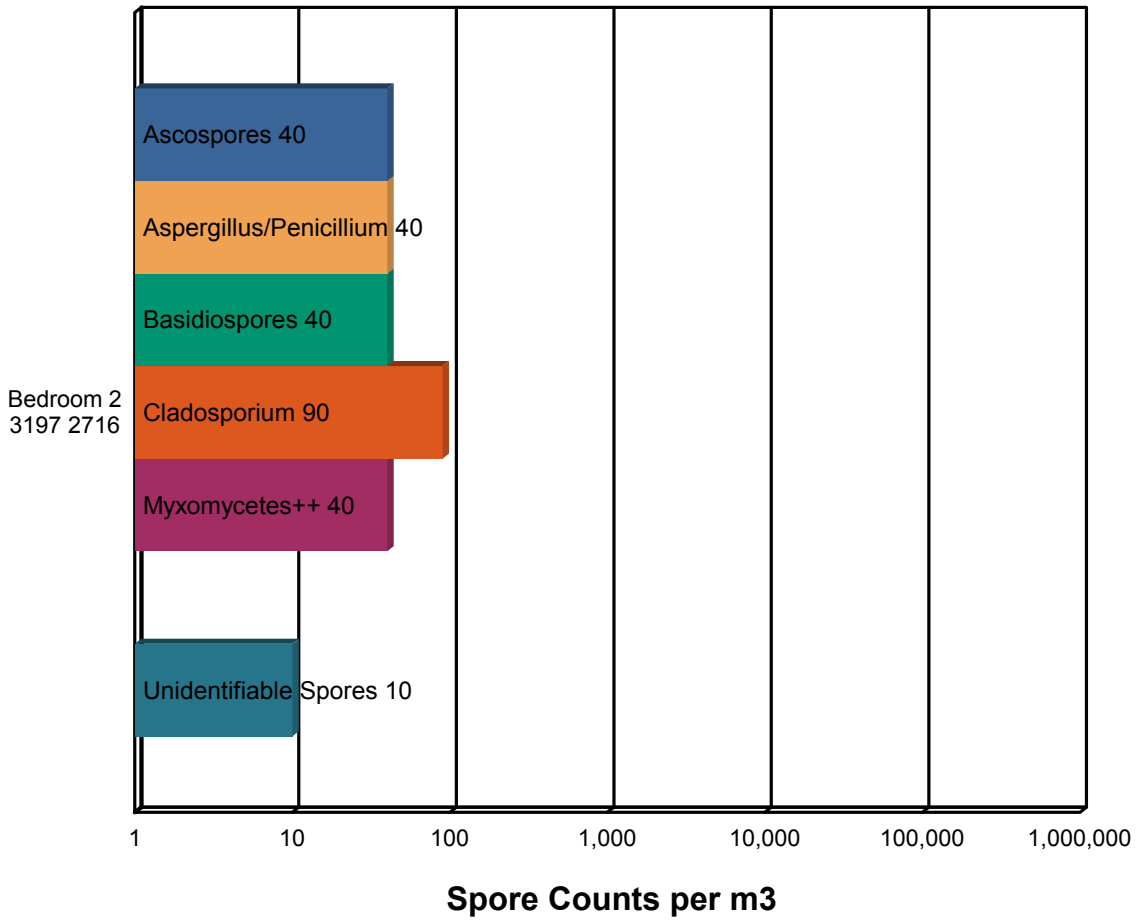

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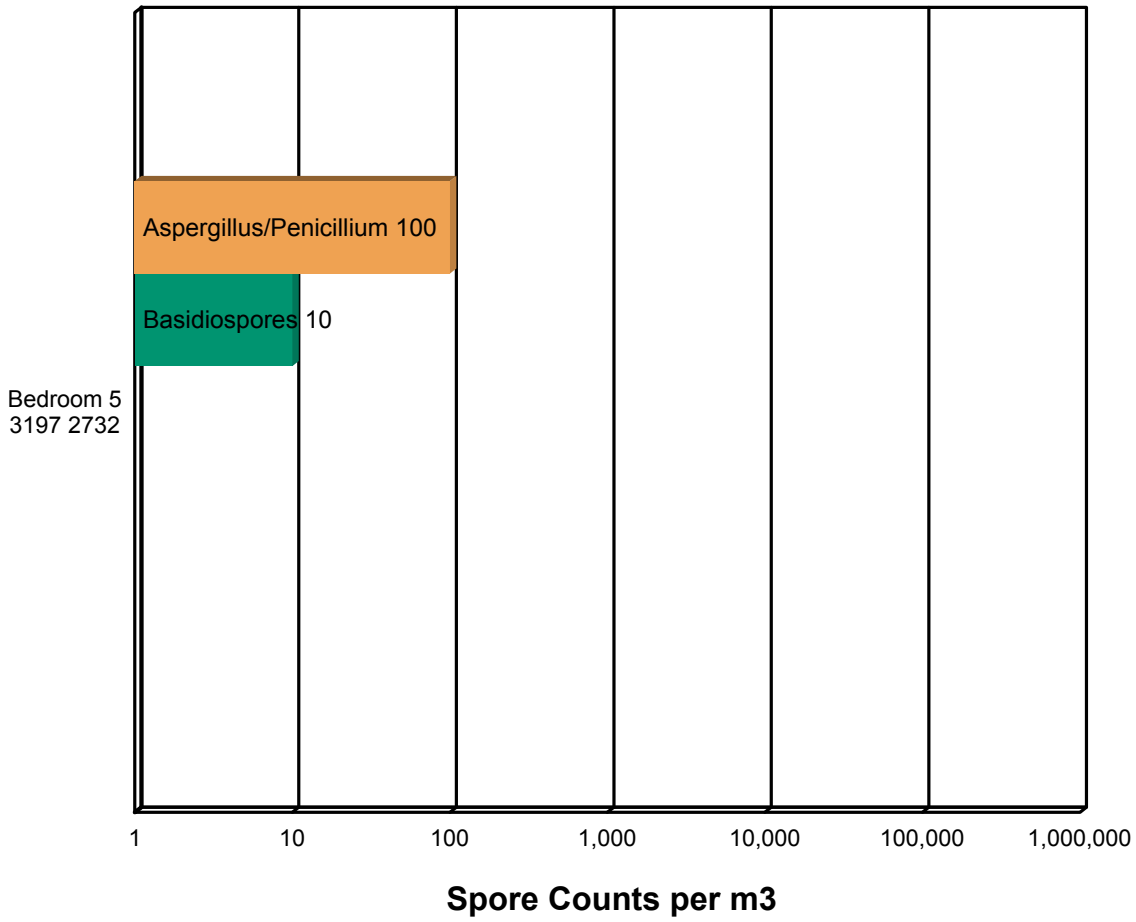

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Aspergillus/Penicillium
Basidiospores
Cladosporium
Myxomycetes++
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Unidentifiable Spores

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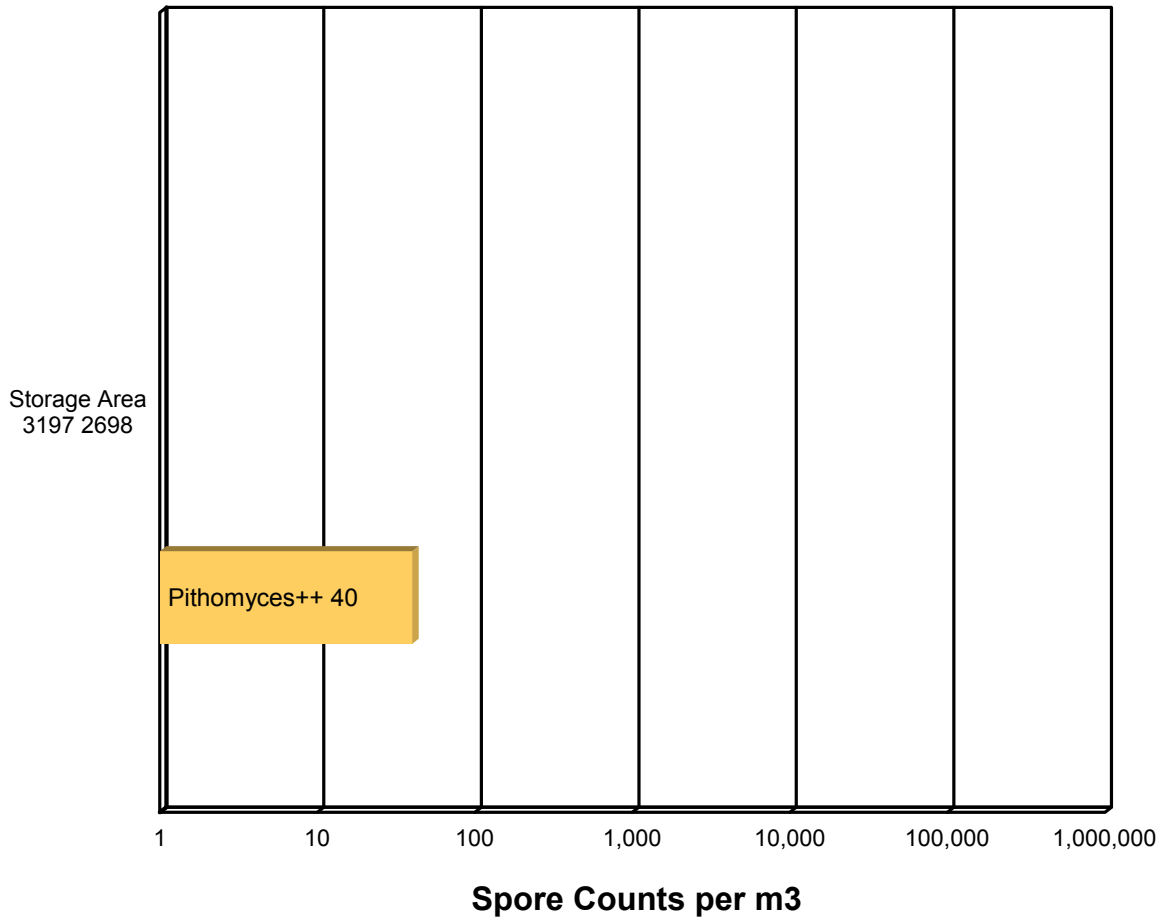

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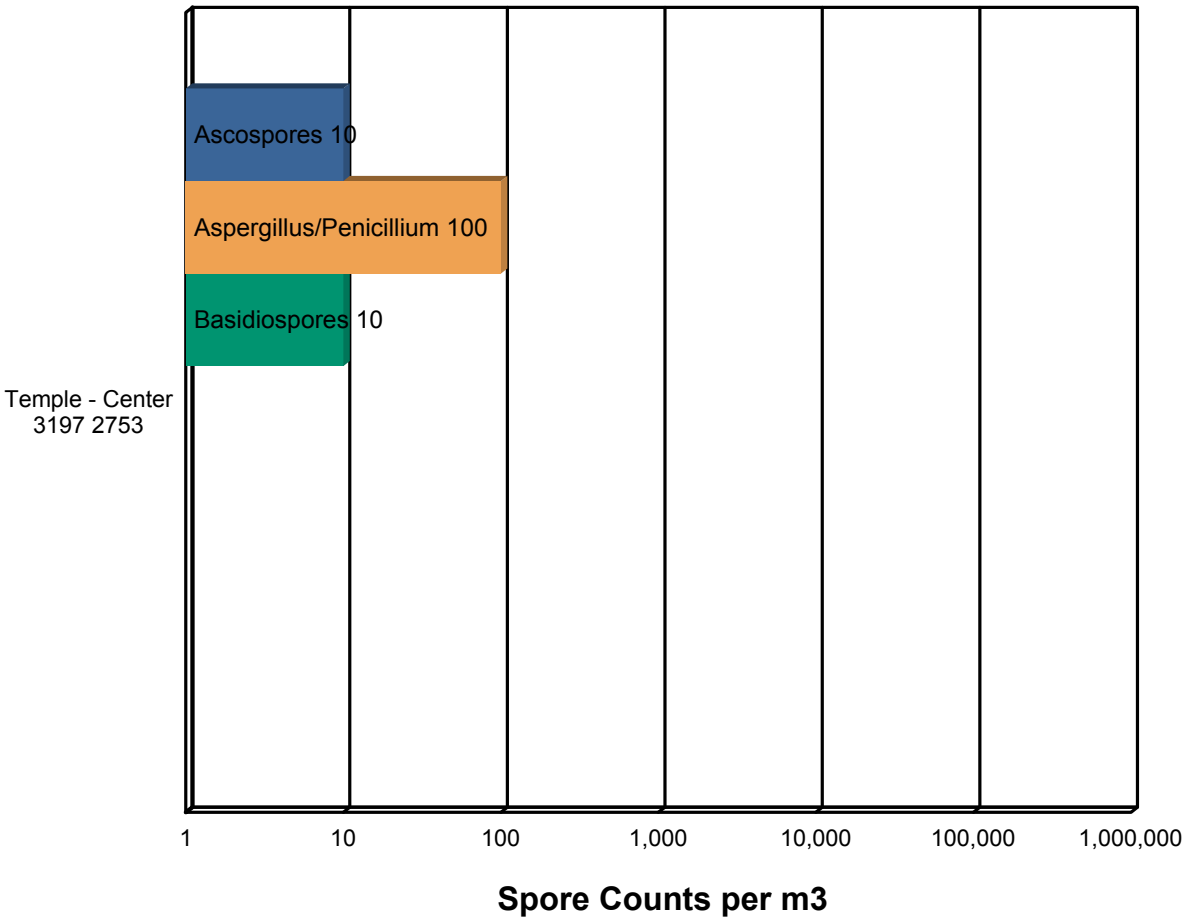

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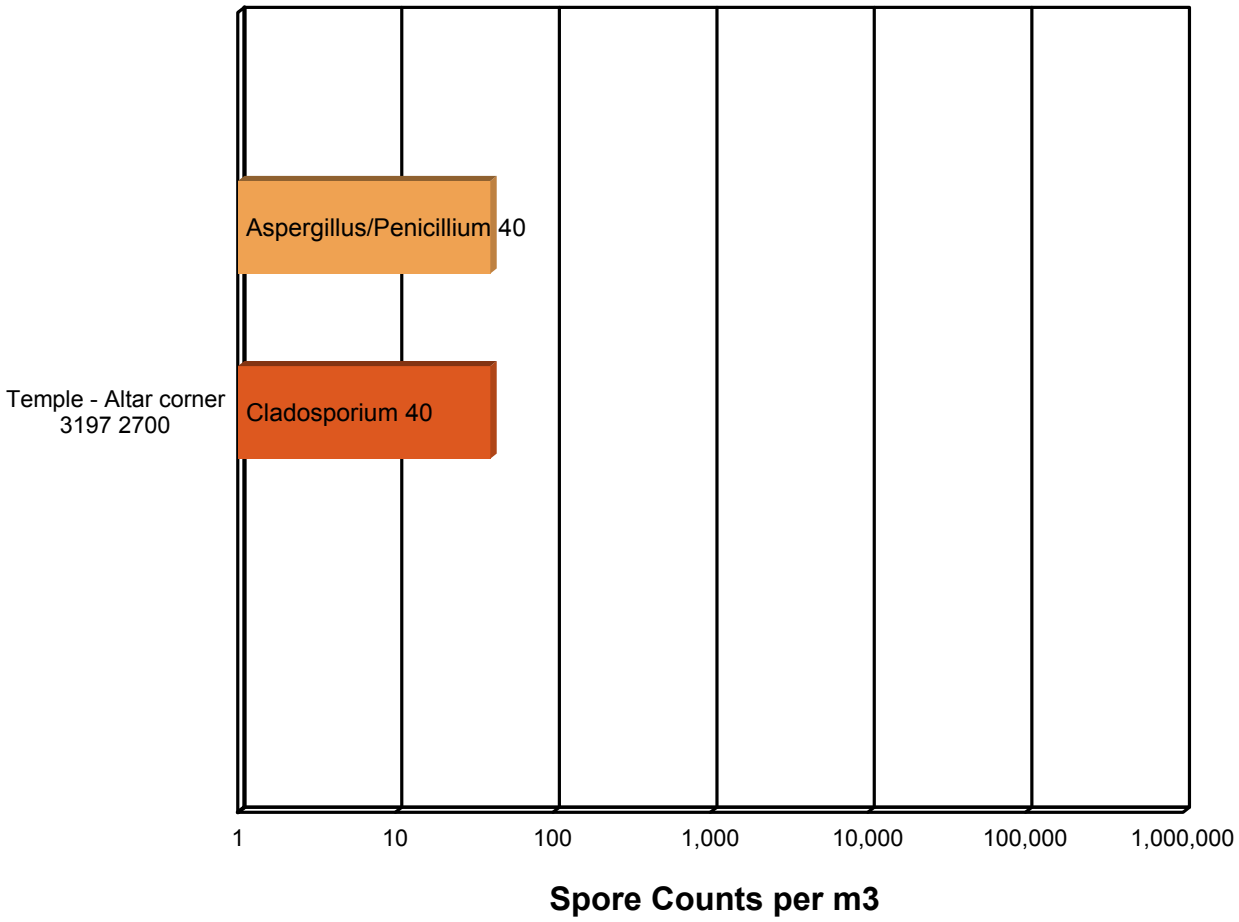

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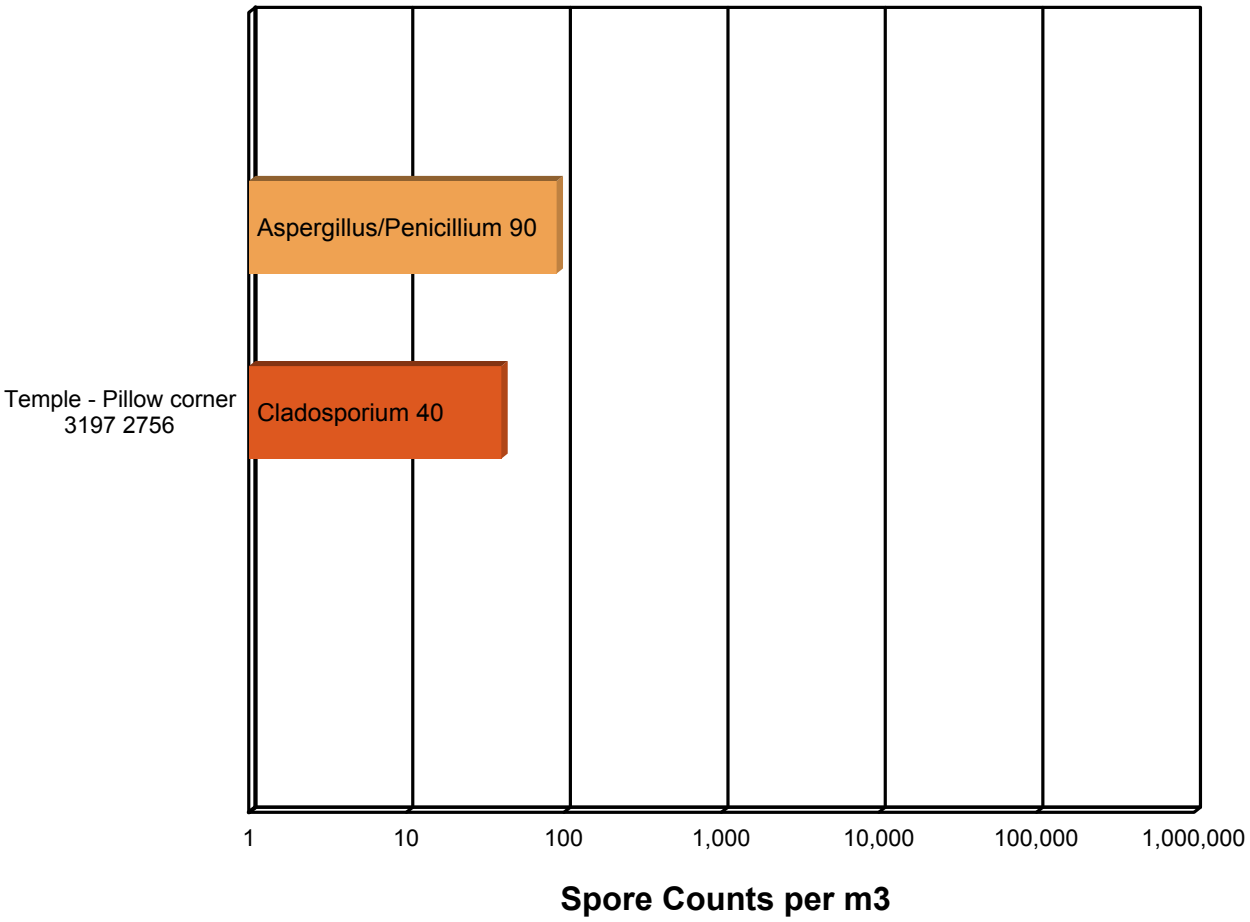

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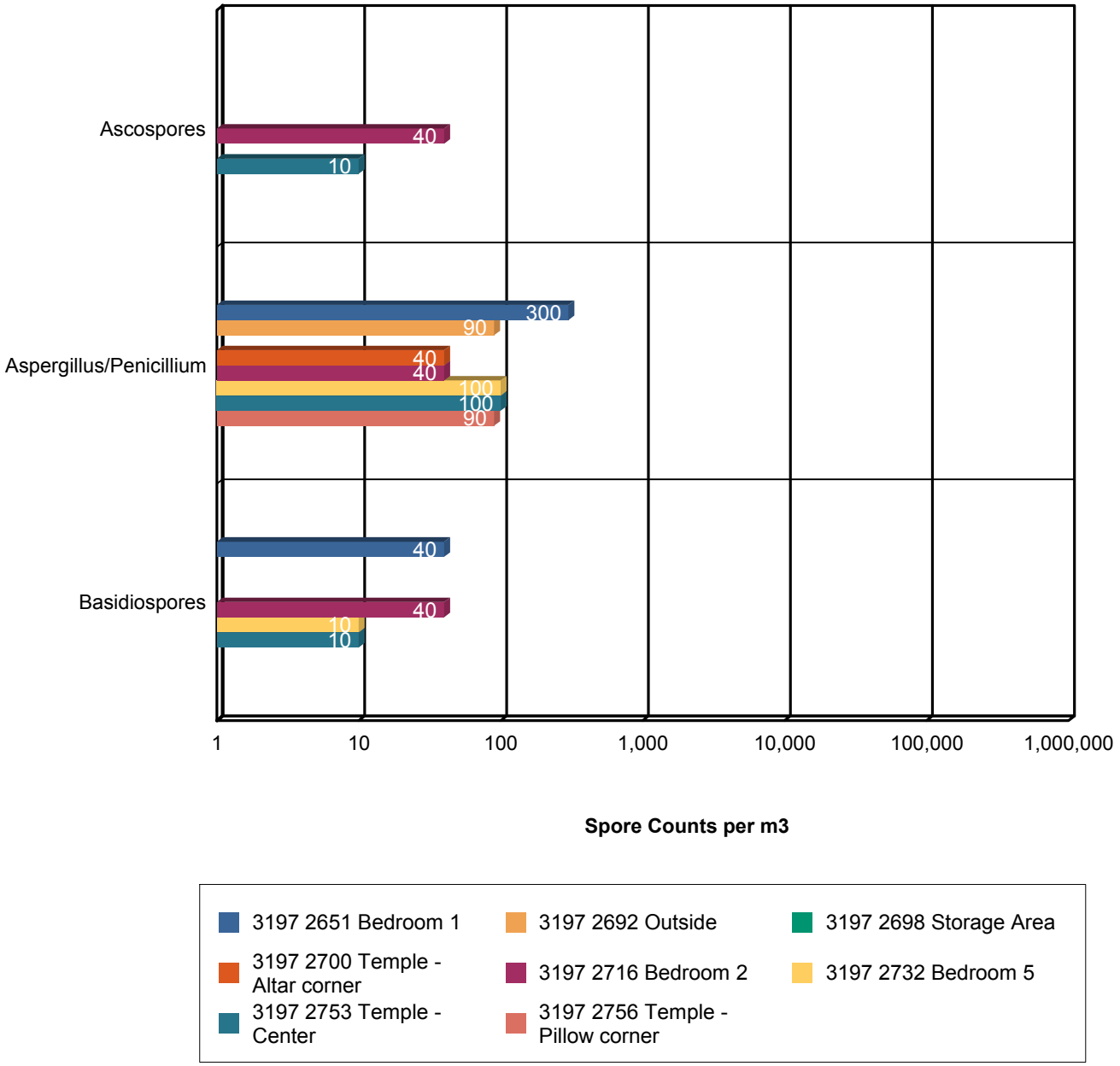
Background Comparison Chart



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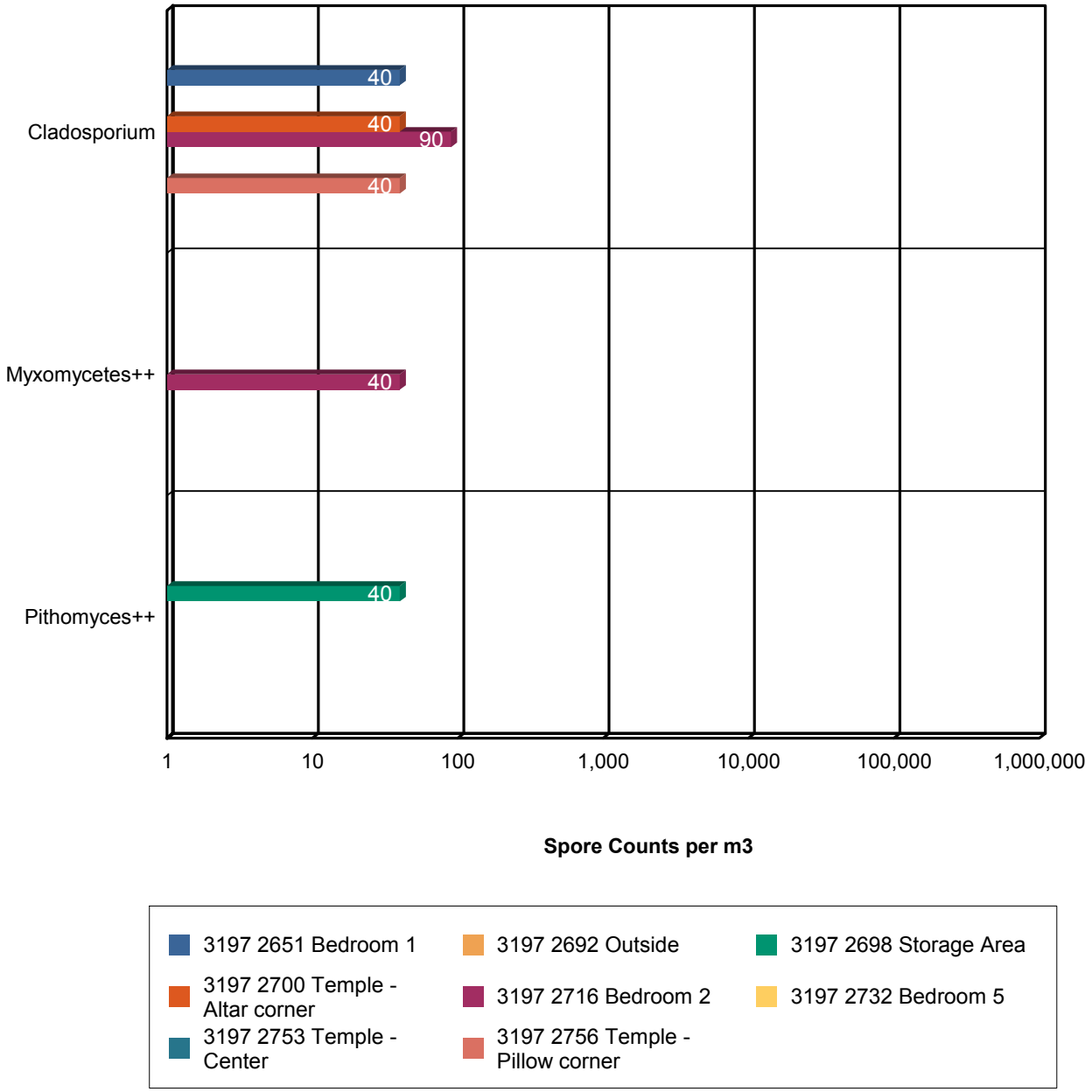

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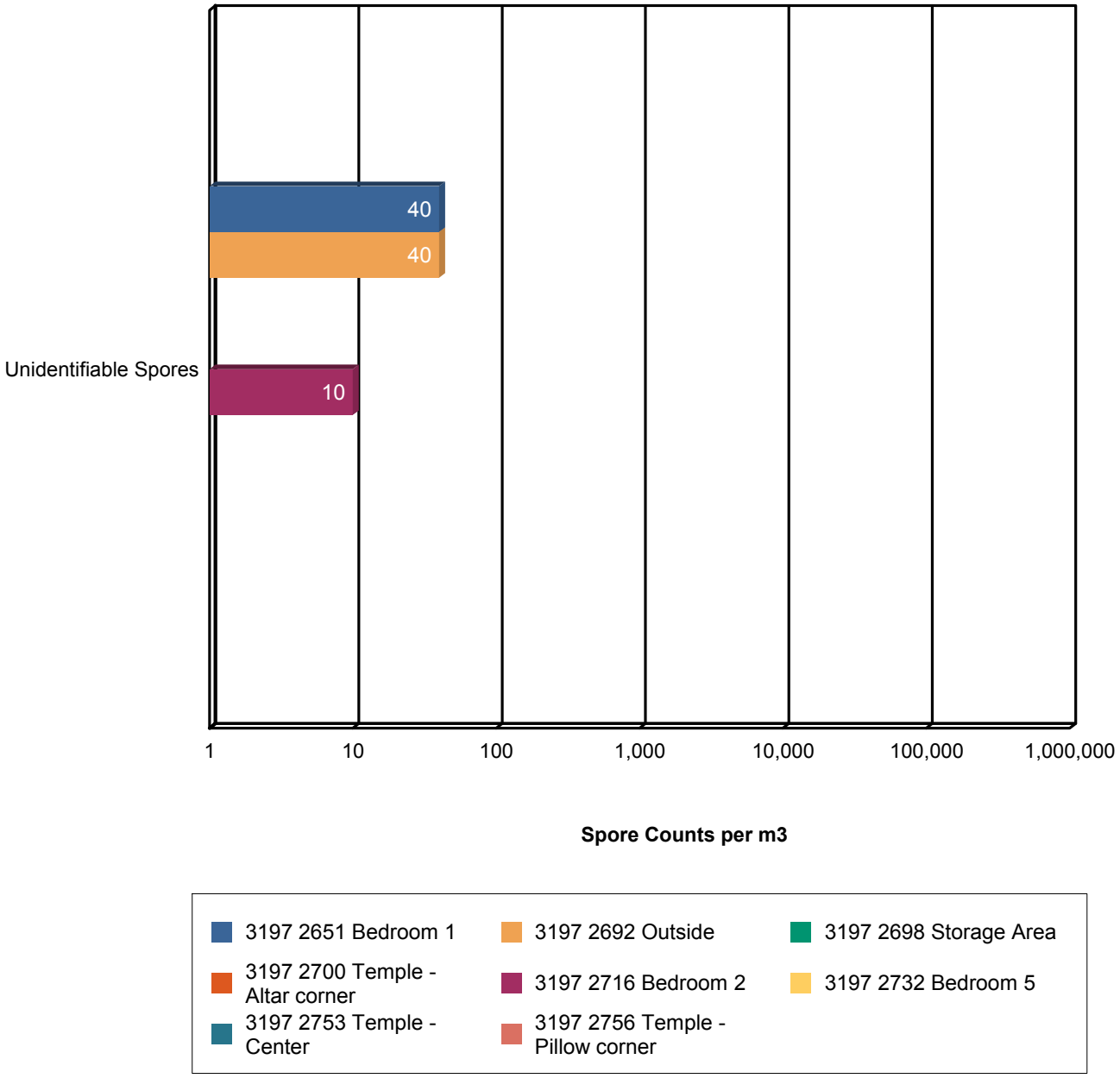

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Test Report: Microscopic Examination of Fungal Spores, Fungal Structures, Hyphae, and Other Particulates from Tape Samples (EMSL Method MICRO-SOP-200)

Lab Sample Number	Client Sample ID	Location	Fungal Identification	Category
552102402-0009	1	Pedestal under stairs	Alternaria (Ulocladium)	Rare
			Ascospores	Rare
			Aspergillus/Penicillium	Low
			Basidiospores	Rare
			Cladosporium	Rare
			Curvularia	Rare
			Epicoccum	Rare
			Ganoderma	Rare
			Hyphal Fragment	Rare
			Insect Fragment	Rare
			Myxomycetes++	Rare
			Nigrospora	Rare
			Pithomyces++	Rare
			Pollen	Rare

No discernable field blank was submitted with this group of samples.

++ = Includes other spores with similar morphology; see EMSL's fungal glossary for each specific category.
* = Sample contains fruiting structures and/or hyphae associated with the spores.
- Denotes Not Detected.

Category	Count/area Analyzed
Rare	1 to 10
Low	11 to 100
Medium	101 to 1000
High	> 1000

Sneha Panchal, M.Sc.,RMCCM Laboratory Manager

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3. Understanding the Results

EMSL Canada Inc. is an independent laboratory, providing unbiased and scientifically valid results. These data represent only a portion of an overall IAQ investigation. Visual information and environmental conditions measured during the site assessment (humidity, moisture readings, etc.) are crucial to any final interpretation of the results. Many factors impact the final results; therefore, result interpretation should only be conducted by qualified individuals. The American Conference of Governmental Industrial Hygienists (ACGIH) has published a good reference book covering sampling and data interpretation. It is entitled, Bioaerosols: Assessment and Control, 1999.

Fungal spores are found everywhere. Whether or not symptoms develop in people exposed to fungi depends on the nature of the fungal material (e.g., allergenic, toxic, or infectious), the exposure level, and the susceptibility of exposed persons. Susceptibility varies with the genetic predisposition (e.g., allergic reactions do not always occur in all individuals), age, pre-existing medical conditions (e.g., diabetes, cancer, or chronic lung conditions), use of immunosuppressive drugs, and concurrent exposures. These reasons make it difficult to identify dose/response relationships that are required to establish “safe” or “unsafe” levels (i.e., permissible exposure limits).

It is generally accepted in the industry that indoor fungal growth is undesirable and inappropriate, necessitating removal or other appropriate remedial actions. The New York City guidelines and EPA guidelines for mold remediation in schools and commercial buildings define the conditions warranting mold remediation. Always remember that water is the key. Preventing water damage or water condensation will prevent mold growth.

This report is not intended to provide medical advice or advice concerning the relative safety of an occupied space. Always consult an occupational or environmental health physician who has experience addressing indoor air contaminants if you have any questions.

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4. Glossary of Fungi

ALTERNARIA(ULOCLADIUM)	
Natural Habitat	Many Basidiomycetes form arthrospores during their mycelial stage. Geotrichum and Oidiodendron are typical ascomycete arthrospore formers. Arthrospores are formed by microfungi, and yeast-like fungi. Arthrospores are disarticulated cells of a formerly vegetative filament that function as spores.
Suitable Substrates in the Indoor Environment	Indoors near condensation (window frames, showers), House dust (in carpets, and air). Also colonizes building supplies, computer disks, cosmetics, leather, optical instruments, paper, sewage, stone monuments, textiles, wood pulp, and jet fuel
Water Activity	Aw =0.85-0.88 (water damage indicator)
Mode of Dissemination	Wind
Allergic Potential	Type I allergies (hay fever, asthma), Type III (hypersensitivity pneumonitis)
Potential or Opportunistic Pathogens	Phaeohyphomycosis {causing cystic granulomas in the skin and subcutaneous tissue}. In immunocompetent patients, Alternaria colonizes the paranasal sinuses, leading to chronic hypertrophic sinusitis
Industrial Uses	Biocontrol of weed plants ·Biocontrol fungal plant pathogens.
Potential Toxins Produced	Alternariol (AOH) . Alternariol monomethylether (AME). Tenuazonic acid (TeA). Altenuene (ALT). Altertoxins (ATX)
Other Comments	Many species of Ulocladium have been renamed as Alternaria. Alternaria spores are one of the most common and potent indoor and outdoor airborne allergens. Additionally, Alternaria sensitization has been determined to be one of the most important factors in the onset of childhood asthma. Synergy with Cladosporium or Ulocladium may increase the severity of symptoms
References	Alternaria redefined. J. Woudenberg et al., Studies in Mycology. Volume 75, June 2013, Pages 171-212

ASCOSPORES	
Natural Habitat	Everywhere in nature.
Suitable Substrates in the Indoor Environment	Depends on genus and species.
Water Activity	Depends on genus and species.
Mode of Dissemination	Forcible ejection or passive release and dissemination by wind or insects.
Allergic Potential	Depends on genus and species.
Potential or Opportunistic Pathogens	Depends on genus and species.
Industrial Uses	Depends on genus and species.
Potential Toxins Produced	Depends on genus and species.
Other Comments	Ascospores are the result of sexual reproduction and produced in a saclike structure called an ascus. All ascospores belong to members of the Phylum Ascomycota, which encompasses a plethora of genera worldwide.

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ASPERGILLUS/PENICILLIUM	
Natural Habitat	Plant debris ·Seed ·Cereal crops
Suitable Substrates in the Indoor Environment	Grows on a wide range of substrates indoors ·Prevalent in water damaged buildings ·Foods (blue mold on cereals, fruits, vegetables, dried foods) ·House dust ·Fabrics ·Leather ·Wallpaper ·Wallpaper glue
Water Activity	Aw=0.75-0.94
Mode of Dissemination	Wind ·Insects
Allergic Potential	Type I (hay fever, asthma) ·Type III (hypersensitivity)
Potential or Opportunistic Pathogens	Possible depending on the species.
Industrial Uses	Many depending on the species
Potential Toxins Produced	Possible depending on the species.
Other Comments	Spores of Aspergillus and Penicillium (including others such as Acremonium, Talaromyces, and Paecilomyces) are small and spherical with few distinguishing characteristics. They cannot be differentiated or speciated by non-viable impaction sampling methods. Some species with very small spores may be undercounted in samples with high background debris.

BASIDIOSPORES	
Natural Habitat	Many Basidiomycetes form arthrospores during their mycelial stage. Geotrichum and Oidiodendron are typical ascomycete arthrospore formers. Arthrospores are formed by microfungi, and yeast-like fungi. Arthrospores are disarticulated cells of a formerly vegetative filament that function as spores.
Suitable Substrates in the Indoor Environment	Depends on genus. Wood products
Water Activity	Unknown.
Mode of Dissemination	Forcible ejection. Wind currents.
Allergic Potential	Type I allergies (hay fever, asthma) . Type III (hypersensitivity pneumonitis)
Potential or Opportunistic Pathogens	Depends on genus.
Industrial Uses	Edible mushrooms are used in the food industry.
Potential Toxins Produced	Amanitins. monomethyl-hydrazine. muscarine. ibotenic acid. psilocybin.
Other Comments	Basidiospores are the result of sexual reproduction and formed on a structure called the basidium. Basidiospores belong to the members of the Phylum Basidiomycota, which includes mushrooms, shelf fungi, rusts, and smuts.

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CLADOSPORIUM	
Natural Habitat	Many Basidiomycetes form arthrospores during their mycelial stage. Geotrichum and Oidiodendron are typical ascomycete arthrospore formers. Arthrospores are formed by microfungi, and yeast-like fungi. Arthrospores are disarticulated cells of a formerly vegetative filament that function as spores.
Suitable Substrates in the Indoor Environment	Fiberglass duct liner. Paint. Textiles. Found in high concentration in water-damaged building materials.
Water Activity	Aw 0.84-0.88
Mode of Dissemination	Air
Allergic Potential	Type I (asthma and hay fever).
Potential or Opportunistic Pathogens	Edema. keratitis. onychomycosis. pulmonary infections. Sinusitis.
Industrial Uses	Produces 10 antigens.
Potential Toxins Produced	Cladosporin and Emodin.

CURVULARIA	
Natural Habitat	Many Basidiomycetes form arthrospores during their mycelial stage. Geotrichum and Oidiodendron are typical ascomycete arthrospore formers. Arthrospores are formed by microfungi, and yeast-like fungi. Arthrospores are disarticulated cells of a formerly vegetative filament that function as spores.
Suitable Substrates in the Indoor Environment	Paper, wood products
Free moisture required for mold growth	Unknown
Mode of Dissemination	Wind
Allergic Potential	Hay fever, asthma, allergic fungal sinusitis
Potential or Opportunistic Pathogens	In immunocompromised patients can cause cerebral abscess, endocarditis, mycetoma, ocular keratitis, onychomycosis, and pneumonia.

EPICOCCUM	
Natural Habitat	A worldwide saprophytic fungi, being isolated from dead plant material and soil.
Suitable Substrates in the Indoor Environment	Paper, textiles
Water Activity	0.86-0.90
Mode of Dissemination	Wind
Allergic Potential	Hay fever, asthma
Potential or Opportunistic Pathogens	Unknown

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GANODERMA	
Natural Habitat	Many Basidiomycetes form arthrospores during their mycelial stage. Geotrichum and Oidiodendron are typical ascomycete arthrospore formers. Arthrospores are formed by microfungi, and yeast-like fungi. Arthrospores are disarticulated cells of a formerly vegetative filament that function as spores.
Suitable Substrates in the Indoor Environment	Unknown.
Water Activity	Unknown.
Mode of Dissemination	Wind.
Allergic Potential	Ganoderma species are known to cause allergies in people on a worldwide scale.
Potential or Opportunistic Pathogens	Unknown.
Industrial Uses	Biopulping of wood for the paper industry. Potential medicinal use due to: 1. Inhibition of Ras dependent cell transformation, 2. Antifibrotic activity, 3. Immunomodulating activity, 4. Free-radicle scavenging
Potential Toxins Produced	Unknown.
Other Comments	Used in traditional Chinese medicine as an herbal supplement. It is also known as a "shelf fungus" because the fruiting body forms a stalk-less shelf on the sides of trees and logs. It is sometimes called “artists conk” because when you scratch the white pores of the fruiting body, the white rubs away and exposes the brown hyphae underneath. Thus, pictures can be produced on the fruiting body.
Reference	References: Craig, R.L., Levetin, E. 2000. Multi-year study of Ganoderma aerobiology. Aerobiologia 16: 75-81. http://www.pfc.forestry.ca/diseases/CTD/Group/Heart/heart6_e.html

MYXOMYCETES++	
Natural Habitat	Many Basidiomycetes form arthrospores during their mycelial stage. Geotrichum and Oidiodendron are typical ascomycete arthrospore formers. Arthrospores are formed by microfungi, and yeast-like fungi. Arthrospores are disarticulated cells of a formerly vegetative filament that function as spores.
Suitable Substrates in the Indoor Environment	Rotting lumber
Free moisture required for mold growth	Unknown
Mode of Dissemination	Insects, Water, Wind
Allergic Potential	Type I
Potential or Opportunistic Pathogens	Unknown
Industrial Uses	
Other Comments	Includes Myxomycetes, Smut, and Periconia.

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Attn: Yvonne Braj
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NIGROSPORA	
Natural Habitat	Common on live or dead grass, seeds & soil.
Suitable Substrates in the Indoor Environment	Unknown
Water Activity	Unknown
Mode of Dissemination	Forcibly projected.
Allergic Potential	Type 1 allergies (hey fever, asthma)
Potential or Opportunistic Pathogens	Keratitis & skin lesions

PITHOMYCES	
Natural Habitat	A worldwide saprophytic fungi, being isolated from dead plant material and soil.
Suitable Substrates in the Indoor Environment	Paper
Water Activity	Requires high moisture for spore germination
Mode of Dissemination	Wind
Allergic Potential	Unknown
Potential or Opportunistic Pathogens	Mycosis in immunocompromised patients
Other Comments	Pithomyces++ includes spores of Pithomyces and Pseudopithomyces.

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Analyzed:	2/23/2021

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5. References and Informational Links

Books

- Bioaerosols: Assessment and Control. Janet Macher, Ed., American Conference of Governmental Industrial Hygienists, Cincinnati, OH 1999.
- Exposure Guidelines for Residential Indoor Air Quality. Environmental Health Directorate, Health Protection Branch, Health Canada, Ottawa, Ontario, 1989.
- Fungal Contamination in Public Buildings: Health Effects and Investigation Methods. Health Canada, Ottawa, Ontario, 2004.
- IICRC: S500 Standard and Reference Guide for Professional Water Damage Restoration. 3rd Edition, Institute of Inspection, Cleaning, and Restoration Certification, Vancouver, WA, 2006

  IICRC: S520 Standard and Reference Guide for Professional Mold Remediation. 1st Edition, Institute of Inspection, Cleaning, and Restoration Certification, Vancouver, WA, 2004
- Field Guide for the Determination of Biological Contaminants in Environmental Samples. 2nd Edition, American Industrial Hygiene Association, 2005.

Consumer Links

Read the full text of AIHA's "The Facts About Mold" consumer brochure.
<http://www.aiha.org/get-involved/VolunteerGroups/Documents/BiosafetyVG-FactsAbout%20MoldDecember2011.pdf>

The Occupational Safety and Health Administration (OSHA)
http://www.osha.gov/SLTC/molds/index.html

CDC Mold Facts
http://www.cdc.gov/mold/faqs.htm

CDC Stachybotrys - Questions and answers on Stachybotrys chartarum and other molds
http://www.cdc.gov/mold/stachy.htm

IOM, NAS: Clearing the Air: Asthma and Indoor Air Exposures
https://www.epa.gov/indoor-air-quality-iaq/should-you-have-air-ducts-your-home-cleaned

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National Library of Medicine-Mold website
http://www.nlm.nih.gov/medlineplus/molds.html

California Department of Health Services (CADOHS)
https://www.cdph.ca.gov/Programs/CCDPHP/DEODC/EHLB/IAQ/Pages/Mold.aspx

Minnesota Department of Health
http://www.health.state.mn.us/divs/eh/indoorair/mold/index.html

New York City Department of Health and Mental Hygiene
https://www1.nyc.gov/site/doh/health/health-topics/mold.page

H.R.: The United States Toxic Mold Safety and Protection Act

EPA

"Should You Have the Air Ducts in Your Home Cleaned?"
<http://www.epa.gov/iaq/pubs/airduct.html>

General information about molds and actions that can be taken to clean up or prevent a mold problem.
<http://www.epa.gov/asthma/molds.html>

“A Brief Guide to Mold, Moisture, and Your Home” - Includes basic information on mold, cleanup guidelines, and moisture and mold prevention
http://www.epa.gov/mold/moldguide.html

“Mold Remediation in Schools and Commercial Buildings” - Information on remediation in schools and commercial property, references for potential mold and moisture remediators.
https://www.epa.gov/mold/mold-remediation-schools-and-commercial-buildings-guide

FEMA

“Homes That Were Flooded May Harbor Mold Problems” - Information and tips for cleaning mold.
http://www.fema.gov/news-release/homes-were-flooded-may-harbor-mold-problems

“Dealing With Mold & Mildew in Your Flood Damaged Home.
http://www.fema.gov/pdf/rebuild/recover/fema_mold_brochure_english.pdf

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6. Important Terms, Conditions, and Limitations

A. Sample Retention

Samples analyzed by EMSL Canada will be retained for 60 days after analysis date Storage beyond this period is available for a fee with written request prior to the initial 30 day period. Samples containing hazardous/toxic substances which require special handling will be returned to the client immediately. EMSL Canadareserves the right to charge a sample disposal fee or return samples to the client.

B. Change Orders and Cancellation

All changes in the scope of work or turnaround time requested by the client after sample acceptance must be made in writing and confirmed in writing by EMSL Canada. If requested changes result in a change in cost the client must accept payment responsibility. In the event work is cancelled by a client, EMSL Canada will complete work in progress and invoice for work completed to the point of cancellation notice. EMSL Canada is not responsible for. holding times that are exceeded due to such changes.

C. Warranty

EMSL Canada warrants to its clients that all services provided hereunder shall be performed in accordance with established and recognized analytical testing procedures and with reasonable care in accordance with applicable federal, state and local laws. The foregoing express warranty is exclusive and is given in lieu of all other warranties, expressed or implied. EMSL Canada disclaims any other warranties, express or implied, including a warranty of fitness for particular purpose and warranty of merchantability.

D. Limits of Liability

In no event shall EMSL Canada be liable for indirect, special, consequential, or incidental damages, including, but not limited to, damages for loss of profit or goodwill regardless of the negligence (either sole or concurrent) of EMSL Canada and whether EMSL Canada has been informed of the possibility of such damages, arising out of or in connection with EMSL Canada's services thereunder or the delivery, use, reliance upon or interpretation of test results by client or any third party. We accept no legal responsibility for the purposes for which the client uses the test results. EMSL Canada will not be held responsible for the improper selection of sampling devices even if we supply the device to the user. The user of the sampling device has the sole responsibility to select the proper sampler and sampling conditions to insure that a valid sample is taken for analysis. Any resampling performed will be at the sole discretion of EMSL Canada, the cost of which shall be limited to the reasonable value of the original sample delivery group (SDG) samples. In no event shall

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EMSL Canada be liable to a client or any third party, whether based upon theories of tort, contract or any other legal or equitable theory, in excess of the amount paid to EMSL Canada by client thereunder.

E. Indemnification

Client shall indemnify EMSL Canada and its officers, directors and employees and hold each of them harmless for any liability, expense or cost, including reasonable attorney's fees, incurred by reason of any third party claim in connection with EMSL Canada services, the test result data or its use by client