



LRC Indoor Testing and Research
 140 Iowa Lane, Suite 102
 Cary, NC 27511
 (919) 342-4936

Certificate of Laboratory Analysis
Non-Viable Spore Trap Analysis

Dare Co. Schools
 Ian Adams
 3020 S Wrightsville Ave
 Nags Head, NC

Project #: 23-2209
Project Location: First Flight Elementary
 107 Veterans Drive
 Kill Devil Hills, NC
Project Type: IEQ
PO/Claim #: -

Table 1: Non-Viable Air Samples

Date Collected:	11/10/23	11/10/23	11/10/23	11/10/23	11/10/23
	1	2	3	4	5
Spore Identification	Cafeteria	Gym	Hall at D113	CR D123	Media Center
<i>Cladosporium</i>	40	27	40	13	27
Ascospores	13	13	-	-	-
Basidiospores ²	-	13	27	27	13
Smuts, <i>Periconia</i> , <i>Myxomycetes</i> ⁴	-	13	13	-	13
<i>Penicillium/Aspergillus</i> Group ¹	40	13	13	67	13
Hyphal Elements ³	-	13	-	13	40
<i>Alternaria</i>	-	-	-	-	-
<i>Curvularia</i>	-	-	-	-	-
<i>Epicoccum</i>	-	-	-	-	-
<i>Cercospora</i>	-	-	-	-	-
<i>Arthrinium</i>	-	-	-	-	-
Clear Brown	-	-	-	-	-
Colorless	-	-	-	-	-
Trichocladium	-	-	-	-	-
Unidentified	-	-	-	-	-
<i>Ulocladium</i>	-	-	-	-	-
Torula	-	-	-	-	-
Pithomyces	-	-	-	-	-
Rust ⁵	-	-	-	-	-
<i>Drechslera/Bipolaris</i>	-	-	-	-	-
<i>Tetraploa</i>	-	-	-	-	-
<i>Chaetomium</i>	-	-	-	-	-
<i>Stachybotrys</i>	-	-	-	-	-
	-	-	-	-	-
Total Spores/m³	93	93	93	120	107
Particulate Level	low-moderate	low	low	low-moderate	low-moderate
Date Analyzed:	11/13/23	11/13/23	11/13/23	11/13/23	11/13/23

Analyzed by: Cathy A. Richmond, B.S.

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Table 1: Non-Viable Air Samples

Date Collected:	11/10/23	11/10/23	11/10/23	11/10/23	11/10/23
	6	7	8	9	10
Spore Identification	Hall at B153	CR B 157	Hall at C122	CR C117	Hall A121
<i>Cladosporium</i>	53	13	13	13	27
Ascospores	-	-	-	-	-
Basidiospores ²	13	13	27	13	-
Smuts, <i>Periconia</i> , <i>Myxomycetes</i> ⁴	27	-	-	-	-
<i>Penicillium/Aspergillus</i> Group ¹	107	-	27	53	-
Hyphal Elements ³	13	-	13	27	-
<i>Alternaria</i>	-	-	-	-	-
<i>Curvularia</i>	13	-	13	-	-
<i>Epicoccum</i>	-	-	-	-	-
<i>Cercospora</i>	-	-	-	-	-
<i>Arthrimum</i>	-	-	-	-	-
Clear Brown	-	-	-	-	-
Colorless	-	-	-	-	-
Trichocladium	-	-	-	-	-
Unidentified	13	-	-	-	-
<i>Ulocladium</i>	-	-	-	-	-
Torula	-	-	-	-	-
Pithomyces	-	-	-	-	-
Rust ⁵	-	-	-	-	-
<i>Drechslera/Bipolaris</i>	-	-	-	-	-
<i>Tetraploa</i>	-	-	-	-	-
<i>Chaetomium</i>	-	-	-	-	-
<i>Stachybotrys</i>	-	-	-	-	-
	-	-	-	-	-
Total Spores/m³	240	27	93	107	27
Particulate Level	low-moderate	low	low	low	low
Date Analyzed:	11/13/23	11/13/23	11/13/23	11/13/23	11/13/23

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Table 1: Non-Viable Air Samples

Date Collected:	11/10/23	11/10/23	11/10/23
	11	12	13
Spore Identification	CR A120	Hall at B111	Outdoor Air
<i>Cladosporium</i>	-	13	827
Ascospores	-	13	933
Basidiospores ²	13	40	107
Smuts, <i>Periconia</i> , <i>Myxomycetes</i> ⁴	-	-	40
<i>Penicillium/Aspergillus</i> Group ¹	-	27	93
Hyphal Elements ³	-	13	40
<i>Alternaria</i>	-	-	40
<i>Curvularia</i>	-	-	13
<i>Epicoccum</i>	-	-	-
<i>Cercospora</i>	-	-	-
<i>Arthrimum</i>	-	-	13
Clear Brown	-	-	-
Colorless	-	-	-
Trichocladium	-	-	-
Unidentified	-	-	13
<i>Ulocladium</i>	-	-	-
Torula	-	-	-
Pithomyces	-	-	-
Rust ⁵	-	-	27
<i>Drechslera/Bipolaris</i>	-	-	-
<i>Tetraploa</i>	-	-	-
<i>Chaetomium</i>	-	-	-
<i>Stachybotrys</i>	-	-	-
	-	-	-
Total Spores/m³	13	107	2147
Particulate Level	low	low	moderate
Date Analyzed:	11/13/23	11/13/23	11/13/23

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Project Type: IEQ
PO/Claim #: -

Sample Number: 1
Sample Location: Cafeteria
Date Collected: 11/10/23
Test Requested: Non-viable spore trap analysis
Date Analyzed: 11/13/23

Volume (L): 75
Percentage of Slide Read: 100.0%
Detection Limit: 13.33
Particulate Level: low-moderate
Notes:

Spore Identification	Count	Results	Units	Percentage
<i>Cladosporium</i>	3	40	spores/m ³	43%
Ascospores	1	13	spores/m ³	14%
Basidiospores		-	spores/m ³	-
Smuts, <i>Periconia</i> , Myxomycetes		-	spores/m ³	-
<i>Penicillium/Aspergillus</i> Group	3	40	spores/m ³	43%
Hyphal Elements		-	spores/m ³	-
<i>Alternaria</i>		-	spores/m ³	-
<i>Curvularia</i>		-	spores/m ³	-
<i>Epicoccum</i>		-	spores/m ³	-
<i>Cercospora</i>		-	spores/m ³	-
<i>Arthrinium</i>		-	spores/m ³	-
Clear Brown		-	spores/m ³	-
Colorless		-	spores/m ³	-
<i>Trichocladium</i>		-	spores/m ³	-
Unidentified		-	spores/m ³	-
<i>Ulocladium</i>		-	spores/m ³	-
Torula		-	spores/m ³	-
<i>Pithomyces</i>		-	spores/m ³	-
Rust		-	spores/m ³	-
<i>Drechslera/Bipolaris</i>		-	spores/m ³	-
<i>Tetraploa</i>		-	spores/m ³	-
<i>Chaetomium</i>		-	spores/m ³	-
<i>Stachybotrys</i>		-	spores/m ³	-
		-	spores/m ³	-
Total Spores	7	93	spores/m³	

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Sample Number: 4
Sample Location: CR D123
Date Collected: 11/10/23
Test Requested: Non-viable spore trap analysis
Date Analyzed: 11/13/23

Volume (L): 75
Percentage of Slide Read: 100.0%
Detection Limit: 13.33
Particulate Level: low-moderate
Notes:

Spore Identification	Count	Results	Units	Percentage
<i>Cladosporium</i>	1	13	spores/m ³	11%
Ascospores		-	spores/m ³	-
Basidiospores	2	27	spores/m ³	22%
Smuts, <i>Periconia</i> , Myxomycetes		-	spores/m ³	-
<i>Penicillium/Aspergillus</i> Group	5	67	spores/m ³	56%
Hyphal Elements	1	13	spores/m ³	11%
<i>Alternaria</i>		-	spores/m ³	-
<i>Curvularia</i>		-	spores/m ³	-
<i>Epicoccum</i>		-	spores/m ³	-
<i>Cercospora</i>		-	spores/m ³	-
<i>Arthrinium</i>		-	spores/m ³	-
Clear Brown		-	spores/m ³	-
Colorless		-	spores/m ³	-
<i>Trichocladium</i>		-	spores/m ³	-
Unidentified		-	spores/m ³	-
<i>Ulocladium</i>		-	spores/m ³	-
Torula		-	spores/m ³	-
<i>Pithomyces</i>		-	spores/m ³	-
Rust		-	spores/m ³	-
<i>Drechslera/Bipolaris</i>		-	spores/m ³	-
<i>Tetraploa</i>		-	spores/m ³	-
<i>Chaetomium</i>		-	spores/m ³	-
<i>Stachybotrys</i>		-	spores/m ³	-
		-	spores/m ³	-
Total Spores	9	120	spores/m³	

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Sample Number: 6
Sample Location: Hall at B153
Date Collected: 11/10/23
Test Requested: Non-viable spore trap analysis
Date Analyzed: 11/13/23

Volume (L): 75
Percentage of Slide Read: 100.0%
Detection Limit: 13.33
Particulate Level: low-moderate
Notes:

Spore Identification	Count	Results	Units	Percentage
<i>Cladosporium</i>	4	53	spores/m ³	22%
Ascospores		-	spores/m ³	-
Basidiospores	1	13	spores/m ³	6%
Smuts, <i>Periconia</i> , Myxomycetes	2	27	spores/m ³	11%
<i>Penicillium/Aspergillus</i> Group	8	107	spores/m ³	44%
Hyphal Elements	1	13	spores/m ³	6%
<i>Alternaria</i>		-	spores/m ³	-
<i>Curvularia</i>	1	13	spores/m ³	6%
<i>Epicoccum</i>		-	spores/m ³	-
<i>Cercospora</i>		-	spores/m ³	-
<i>Arthrinium</i>		-	spores/m ³	-
Clear Brown		-	spores/m ³	-
Colorless		-	spores/m ³	-
<i>Trichocladium</i>		-	spores/m ³	-
Unidentified	1	13	spores/m ³	6%
<i>Ulocladium</i>		-	spores/m ³	-
Torula		-	spores/m ³	-
<i>Pithomyces</i>		-	spores/m ³	-
Rust		-	spores/m ³	-
<i>Drechslera/Bipolaris</i>		-	spores/m ³	-
<i>Tetraploa</i>		-	spores/m ³	-
<i>Chaetomium</i>		-	spores/m ³	-
<i>Stachybotrys</i>		-	spores/m ³	-
		-	spores/m ³	-
Total Spores	18	240	spores/m³	

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Sample Number: 7
Sample Location: CR B 157
Date Collected: 11/10/23
Test Requested: Non-viable spore trap analysis
Date Analyzed: 11/13/23

Volume (L): 75
Percentage of Slide Read: 100.0%
Detection Limit: 13.33
Particulate Level: low
Notes:

Spore Identification	Count	Results	Units	Percentage
<i>Cladosporium</i>	1	13	spores/m ³	50%
Ascospores		-	spores/m ³	-
Basidiospores	1	13	spores/m ³	50%
Smuts, <i>Periconia</i> , Myxomycetes		-	spores/m ³	-
<i>Penicillium/Aspergillus</i> Group		-	spores/m ³	-
Hyphal Elements		-	spores/m ³	-
<i>Alternaria</i>		-	spores/m ³	-
<i>Curvularia</i>		-	spores/m ³	-
<i>Epicoccum</i>		-	spores/m ³	-
<i>Cercospora</i>		-	spores/m ³	-
<i>Arthrimum</i>		-	spores/m ³	-
Clear Brown		-	spores/m ³	-
Colorless		-	spores/m ³	-
<i>Trichocladium</i>		-	spores/m ³	-
Unidentified		-	spores/m ³	-
<i>Ulocladium</i>		-	spores/m ³	-
Torula		-	spores/m ³	-
<i>Pithomyces</i>		-	spores/m ³	-
Rust		-	spores/m ³	-
<i>Drechslera/Bipolaris</i>		-	spores/m ³	-
<i>Tetraploa</i>		-	spores/m ³	-
<i>Chaetomium</i>		-	spores/m ³	-
<i>Stachybotrys</i>		-	spores/m ³	-
		-	spores/m ³	-
Total Spores	2	27	spores/m³	

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PO/Claim #: -

Sample Number: 9
Sample Location: CR C117
Date Collected: 11/10/23
Test Requested: Non-viable spore trap analysis
Date Analyzed: 11/13/23

Volume (L): 75
Percentage of Slide Read: 100.0%
Detection Limit: 13.33
Particulate Level: low
Notes:

Spore Identification	Count	Results	Units	Percentage
<i>Cladosporium</i>	1	13	spores/m ³	13%
Ascospores		-	spores/m ³	-
Basidiospores	1	13	spores/m ³	13%
Smuts, <i>Periconia</i> , Myxomycetes		-	spores/m ³	-
<i>Penicillium/Aspergillus</i> Group	4	53	spores/m ³	50%
Hyphal Elements	2	27	spores/m ³	25%
<i>Alternaria</i>		-	spores/m ³	-
<i>Curvularia</i>		-	spores/m ³	-
<i>Epicoccum</i>		-	spores/m ³	-
<i>Cercospora</i>		-	spores/m ³	-
<i>Arthrinium</i>		-	spores/m ³	-
Clear Brown		-	spores/m ³	-
Colorless		-	spores/m ³	-
<i>Trichocladium</i>		-	spores/m ³	-
Unidentified		-	spores/m ³	-
<i>Ulocladium</i>		-	spores/m ³	-
Torula		-	spores/m ³	-
<i>Pithomyces</i>		-	spores/m ³	-
Rust		-	spores/m ³	-
<i>Drechslera/Bipolaris</i>		-	spores/m ³	-
<i>Tetraploa</i>		-	spores/m ³	-
<i>Chaetomium</i>		-	spores/m ³	-
<i>Stachybotrys</i>		-	spores/m ³	-
		-	spores/m ³	-
Total Spores	8	107	spores/m³	

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Sample Number: 13 **Volume (L):** 75
Sample Location: Outdoor Air **Percentage of Slide Read:** 100.0%
Date Collected: 11/10/23 **Detection Limit:** 13.33
Test Requested: Non-viable spore trap analysis **Particulate Level:** moderate
Date Analyzed: 11/13/23 **Notes:**

Spore Identification	Count	Results	Units	Percentage
<i>Cladosporium</i>	62	827	spores/m ³	39%
Ascospores	70	933	spores/m ³	43%
Basidiospores	8	107	spores/m ³	5%
Smuts, <i>Periconia</i> , Myxomycetes	3	40	spores/m ³	2%
<i>Penicillium/Aspergillus</i> Group	7	93	spores/m ³	4%
Hyphal Elements	3	40	spores/m ³	2%
<i>Alternaria</i>	3	40	spores/m ³	2%
<i>Curvularia</i>	1	13	spores/m ³	1%
<i>Epicoccum</i>		-	spores/m ³	-
<i>Cercospora</i>		-	spores/m ³	-
<i>Arthrimum</i>	1	13	spores/m ³	1%
Clear Brown		-	spores/m ³	-
Colorless		-	spores/m ³	-
<i>Trichocladium</i>		-	spores/m ³	-
Unidentified	1	13	spores/m ³	1%
<i>Ulocladium</i>		-	spores/m ³	-
Torula		-	spores/m ³	-
<i>Pithomyces</i>		-	spores/m ³	-
Rust	2	27	spores/m ³	1%
<i>Drechslera/Bipolaris</i>		-	spores/m ³	-
<i>Tetraploa</i>		-	spores/m ³	-
<i>Chaetomium</i>		-	spores/m ³	-
<i>Stachybotrys</i>		-	spores/m ³	-
		-	spores/m ³	-
Total Spores	161	2147	spores/m³	

Analyzed by: Cathy A. Richmond, B.S.



Certificate of Laboratory Analysis

Project #: **23-2209**

Report Information:

DETECTION LIMITS (DL) for samples are the minimum number of spores or colonies forming units that can be satisfactorily identified for each sample type.

SPORE TRAP SAMPLES: Calculations based on volume of air sampled & percentage of slide counted, i.e. DL = 1000 L / 75 L if 100% of the slide is counted.

CODE 11: Fungal content and/or particulate level on slide too heavy to identify and enumerate fungal content.

Footnotes:

1. *Penicillium/Aspergillus* group spores are characterized by their small size, round to ovoid shape, being unicellular and usually colorless to lightly pigmented. There are numerous genera of fungi whose spore morphology is similar to that of the *Penicillium/Aspergillus* type. Several common examples would be *Acremonium*, *Paecilomyces*, and *Trichoderma*. Although the majority of spores placed in this group are *Penicillium*, *Aspergillus*, or a combination of both, these are not the only two possibilities.
2. Basidiospores are primarily transported indoors from outdoor sources and rarely grow indoors. A high basidiospore count indoors can be indicative of a wood decay problem or wet soil, and should be verified if and an outdoor source of the spores is not present.
3. Hyphae are the tubular filaments of fungi. Hyphae can fragment and become airborne much like spores and are potentially allergenic.
4. The Smut, *Periconia*, Myxomycete group is a group composed of three different types of organisms whose spores have similar morphologies. Smuts are plant pathogens, *Periconia* is a relatively uncommon mold indoors, and Myxomycetes are not fungi, but slime molds. Although these organisms do not typically proliferate indoors, their spores are potentially allergenic.
5. Rusts are plant pathogens. These fungi do not typically grow indoors unless an infected plant is present. Rust spores are potentially allergenic.

Direct Microscopic Exam Reporting:

We use a 400x-600x magnification microscope.

Reporting Quantification Levels are as follows:

Reporting Level	Quantitative Description
Occasional	1-10 per square inch
Few	11-100 per square inch
Moderate	101-1000 per square inch
Numerous	More than 1,000 per square inch

Submitted By Analyst:

Cathy A. Richmond, BS

11/13/2023