



Certificate of Laboratory Analysis
Non-Viable Spore Trap Analysis

Dare County Schools
 Ian Adams
 3020 Wrightsville Avenue
 Nags Head, NC

Project #: 25-1424
Project Location: Maintenance Shop and Bus Garage
 1013 & 1015 Driftwood Drive
 Manteo, NC
Project Type: IAQ
PO/Claim #:

Table 1: Non-Viable Air Samples

Date Collected:	4/22/25	4/22/25	4/22/25	4/22/25	4/22/25
Spore Identification	1	2	3	4	5
	Maintenance Front Office	Maintenance Shop-Break Room	Bus Garage - shop office	Bus Garage - parts	Bus Garage - 2nd Floor
<i>Cladosporium</i>	467	173	40	67	67
Ascospores	40	40	-	27	40
Basidiospores ²	53	53	40	13	40
Smuts, <i>Periconia</i> , <i>Myxomycetes</i> ⁴	133	67	53	40	40
<i>Penicillium/Aspergillus</i> Group ¹	80	27	13	27	-
Hyphal Elements ³	53	13	27	27	13
<i>Alternaria</i>	27	-	-	-	-
<i>Curvularia</i>	27	13	13	13	-
<i>Epicoccum</i>	40	-	13	-	13
<i>Cercospora</i>	-	-	-	-	-
<i>Arthrimum</i>	-	-	-	-	-
Clear Brown	-	-	-	-	-
Colorless	-	-	-	-	-
<i>Trichocladium</i>	-	-	-	-	-
Unidentified	-	27	-	-	-
<i>Ulocladium</i>	-	-	-	-	-
Torula	-	-	-	-	-
Pithomyces	-	-	-	-	-
Rust ⁵	-	-	-	-	13
<i>Drechslera/Bipolaris</i>	-	-	13	-	-
<i>Tetraploa</i>	-	-	-	-	-
<i>Chaetomium</i>	-	-	-	-	-
<i>Stachybotrys</i>	-	-	-	-	-
	-	-	-	-	-
Total Spores/m³	920	413	213	213	227
*Non-fungal Background Particulate Level	moderate-heavy	low-moderate	moderate	low-moderate	moderate
Date Analyzed:	4/25/25	4/25/25	4/25/25	4/25/25	4/25/25

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

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Table 1: Non-Viable Air Samples

Date Collected:	4/22/25
Spore Identification	6
	Outdoor Air
<i>Cladosporium</i>	2347
Ascospores	373
Basidiospores ²	187
Smuts, <i>Periconia</i> , <i>Myxomycetes</i> ⁴	80
<i>Penicillium/Aspergillus</i> Group ¹	53
Hyphal Elements ³	-
<i>Alternaria</i>	-
<i>Curvularia</i>	53
<i>Epicoccum</i>	-
<i>Cercospora</i>	53
<i>Arthrinium</i>	-
Clear Brown	-
Colorless	-
<i>Trichocladium</i>	-
Unidentified	-
<i>Ulocladium</i>	-
Torula	-
Pithomyces	-
Rust ⁵	80
<i>Drechslera/Bipolaris</i>	-
<i>Tetraploa</i>	-
<i>Chaetomium</i>	-
<i>Stachybotrys</i>	-
	-
Total Spores/m ³	3227
Non-Fungal Background Particulate Level	low-moderate
Date Analyzed:	4/25/25

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PO/Claim #:

Sample Number: 1
Sample Location: Maintenance Front Office
Date Collected: 4/22/25
Test Requested: Non-viable spore trap analysis
Date Analyzed: 4/25/25
Volume (L): 75
Percentage of Slide Read: 100.0%
Detection Limit: 13.33
Particulate Level: moderate-heavy
Notes:

Spore Identification	Count	Results	Units	Percentage
<i>Cladosporium</i>	35	467	spores/m ³	51%
Ascospores	3	40	spores/m ³	4%
Basidiospores	4	53	spores/m ³	6%
Smuts, <i>Periconia</i> , Myxomycetes	10	133	spores/m ³	14%
<i>Penicillium/Aspergillus</i> Group	6	80	spores/m ³	9%
Hyphal Elements	4	53	spores/m ³	6%
<i>Alternaria</i>	2	27	spores/m ³	3%
<i>Curvularia</i>	2	27	spores/m ³	3%
<i>Epicoccum</i>	3	40	spores/m ³	4%
<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	69	920	spores/m³	

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Project Type: IAQ
PO/Claim #:

Sample Number: 3
Sample Location: Bus Garage - shop office
Date Collected: 4/22/25
Test Requested: Non-viable spore trap analysis
Date Analyzed: 4/25/25
Volume (L): 75
Percentage of Slide Read: 100.0%
Detection Limit: 13.33
Particulate Level: moderate
Notes:

Spore Identification	Count	Results	Units	Percentage
<i>Cladosporium</i>	3	40	spores/m ³	19%
Ascospores		-	spores/m ³	-
Basidiospores	3	40	spores/m ³	19%
Smuts, <i>Periconia</i> , Myxomycetes	4	53	spores/m ³	25%
<i>Penicillium/Aspergillus</i> Group	1	13	spores/m ³	6%
Hyphal Elements	2	27	spores/m ³	13%
<i>Alternaria</i>		-	spores/m ³	-
<i>Curvularia</i>	1	13	spores/m ³	6%
<i>Epicoccum</i>	1	13	spores/m ³	6%
<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>	1	13	spores/m ³	6%
<i>Tetraploa</i>		-	spores/m ³	-
<i>Chaetomium</i>		-	spores/m ³	-
<i>Stachybotrys</i>		-	spores/m ³	-
		-	spores/m ³	-
Total Spores	16	213	spores/m³	

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Sample Number: 4
Sample Location: Bus Garage - parts
Date Collected: 4/22/25
Test Requested: Non-viable spore trap analysis
Date Analyzed: 4/25/25
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>	5	67	spores/m ³	31%
Ascospores	2	27	spores/m ³	13%
Basidiospores	1	13	spores/m ³	6%
Smuts, <i>Periconia</i> , Myxomycetes	3	40	spores/m ³	19%
<i>Penicillium/Aspergillus</i> Group	2	27	spores/m ³	13%
Hyphal Elements	2	27	spores/m ³	13%
<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		-	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	16	213	spores/m³	

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PO/Claim #:

Sample Number: 5
Sample Location: Bus Garage - 2nd Floor
Date Collected: 4/22/25
Test Requested: Non-viable spore trap analysis
Date Analyzed: 4/25/25
Volume (L): 75
Percentage of Slide Read: 100.0%
Detection Limit: 13.33
Particulate Level: moderate
Notes:

Spore Identification	Count	Results	Units	Percentage
<i>Cladosporium</i>	5	67	spores/m ³	29%
Ascospores	3	40	spores/m ³	18%
Basidiospores	3	40	spores/m ³	18%
Smuts, <i>Periconia</i> , Myxomycetes	3	40	spores/m ³	18%
<i>Penicillium/Aspergillus</i> Group		-	spores/m ³	-
Hyphal Elements	1	13	spores/m ³	6%
<i>Alternaria</i>		-	spores/m ³	-
<i>Curvularia</i>		-	spores/m ³	-
<i>Epicoccum</i>	1	13	spores/m ³	6%
<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	1	13	spores/m ³	6%
<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	17	227	spores/m³	

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Sample Number: 6
Sample Location: Outdoor Air
Date Collected: 4/22/25
Test Requested: Non-viable spore trap analysis
Date Analyzed: 4/25/25
Volume (L): 75
Percentage of Slide Read: 50.0%
Detection Limit: 26.67
Particulate Level: low-moderate
Notes:

Spore Identification	Count	Results	Units	Percentage
<i>Cladosporium</i>	88	2347	spores/m ³	73%
Ascospores	14	373	spores/m ³	12%
Basidiospores	7	187	spores/m ³	6%
Smuts, <i>Periconia</i> , Myxomycetes	3	80	spores/m ³	2%
<i>Penicillium/Aspergillus</i> Group	2	53	spores/m ³	2%
Hyphal Elements		-	spores/m ³	-
<i>Alternaria</i>		-	spores/m ³	-
<i>Curvularia</i>	2	53	spores/m ³	2%
<i>Epicoccum</i>		-	spores/m ³	-
<i>Cercospora</i>	2	53	spores/m ³	2%
<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	3	80	spores/m ³	2%
<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	121	3227	spores/m³	

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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.

Chain of Custody available on request

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