



**Name:** Environmental Testing & Training Northwest  
**Address:** 2266 McGilchrist St SE #220  
 Salem, OR 97302  
**Phone:** 541-870-4331

**Project Number:** Eddyville Sch Rd  
**P.O. Number:** 2190081  
**Project Name:** Eddyville CS  
**Collected Date:** 2/20/2019  
**Received Date:** 2/22/2019 9:40:00 AM

SanAir ID Number  
**19008062**  
 FINAL REPORT  
 2/22/2019 12:15:32 PM

Analyst: Pulliam, Tashema

## Air Cassette Analysis

ND = None Detected. Blank spaces indicate no spores detected.

SanAir ID Number	19008062-001			19008062-002			19008062-003			19008062-004		
Analysis Using STL	105C			105C			105C			105C		
Sample Number	1			2			3			4		
Sample Identification	Exterior Air Sample			Work Room Air Sample			Missy Room Air Sample			Jennifer Room Air Sample		
Sample Type	Air Cassette - Air-O-Cell			Air Cassette - Air-O-Cell			Air Cassette - Air-O-Cell			Air Cassette - Air-O-Cell		
Volume	75 Liters			75 Liters			75 Liters			75 Liters		
Analytical Sensitivity	13 Count/M <sup>3</sup>			13 Count/M <sup>3</sup>			13 Count/M <sup>3</sup>			13 Count/M <sup>3</sup>		
Background Density	1			2+			2+			2		
<b>Other</b>	<b>Raw Count</b>	<b>Count/M<sup>3</sup></b>	<b>%</b>	<b>Raw Count</b>	<b>Count/M<sup>3</sup></b>	<b>%</b>	<b>Raw Count</b>	<b>Count/M<sup>3</sup></b>	<b>%</b>	<b>Raw Count</b>	<b>Count/M<sup>3</sup></b>	<b>%</b>
Mycelial Fragments										1	13	n/a
<b>Fungal Identification</b>	<b>Raw Count</b>	<b>Count/M<sup>3</sup></b>	<b>%</b>	<b>Raw Count</b>	<b>Count/M<sup>3</sup></b>	<b>%</b>	<b>Raw Count</b>	<b>Count/M<sup>3</sup></b>	<b>%</b>	<b>Raw Count</b>	<b>Count/M<sup>3</sup></b>	<b>%</b>
Ascospores	25	333	12	2	27	6	2	27	6	2	27	8
Aspergillus/Penicillium				16	213	46	2	27	6	5	67	19
Basidiospores	166	2213	83	14	187	40	25	333	76	16	213	62
Cladosporium species	10	133	5	3	40	9	3	40	9			
Smuts/Myxomycetes										2	27	8
Ulocladium species							1	13	3	1	13	4
<b>TOTAL</b>	<b>201</b>	<b>2680</b>		<b>35</b>	<b>467</b>		<b>33</b>	<b>440</b>		<b>26</b>	<b>347</b>	

Signature:

*Tashema Pulliam*

Date: 2/22/2019

Reviewed:

*Johnathan Wilson*

Date: 2/22/2019



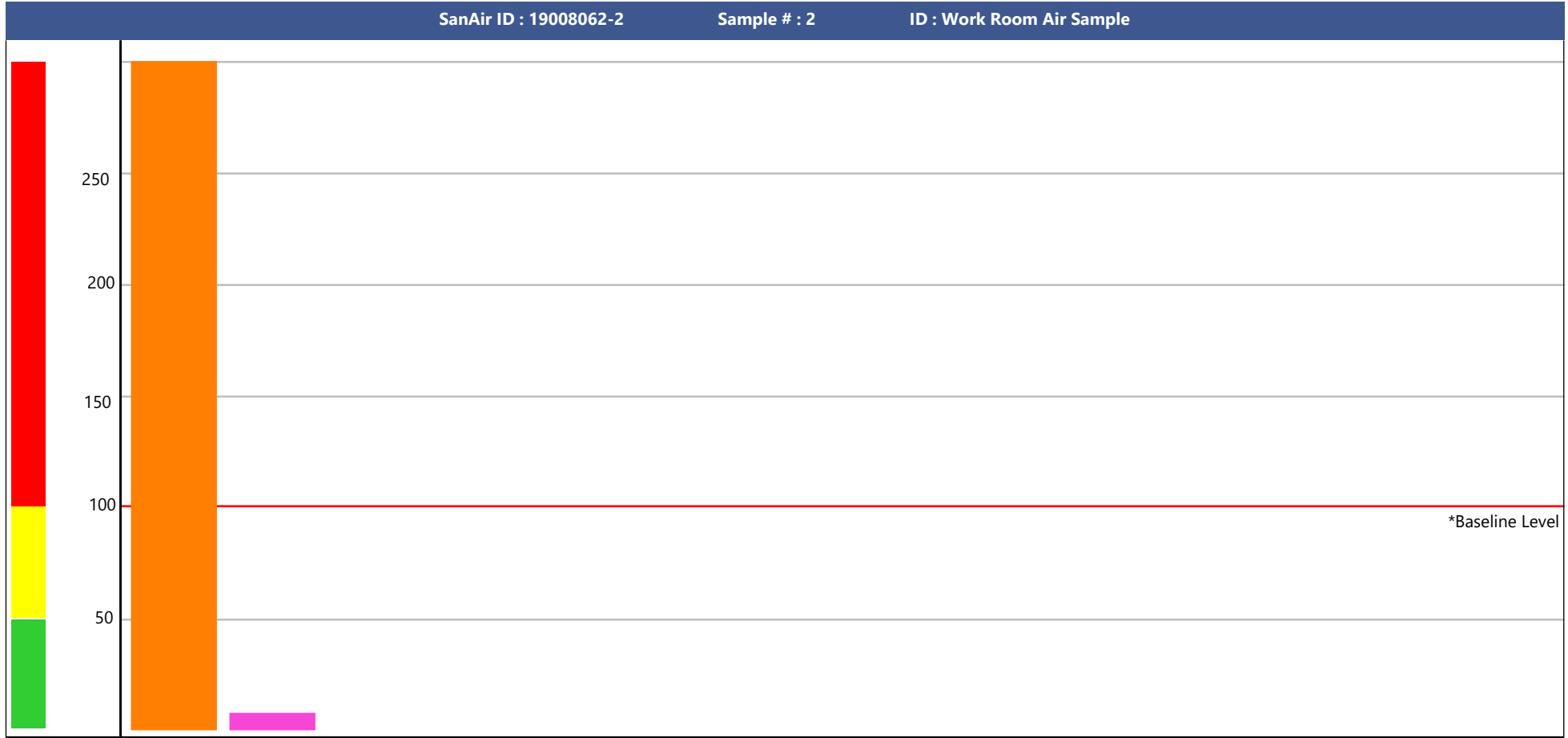
**Name:** Environmental Testing & Training Northwest  
**Address:** 2266 McGilchrist St SE #220  
 Salem, OR 97302  
**Phone:** 541-870-4331

**Project Number:** Eddyville Sch Rd  
**P.O. Number:** 2190081  
**Project Name:** Eddyville CS  
**Collected Date:** 2/20/2019  
**Received Date:** 2/22/2019 9:40:00 AM

SanAir ID Number  
**19008062**  
 FINAL REPORT  
 2/22/2019 12:15:32 PM

Analyst: Pulliam, Tashema

### Air Cassette Analysis - Spores % of Exterior Air



Count/m³ higher than Baseline	Aspergillus/Penicillium	Basidiospores
Count/m³ comparable to Baseline		
Within 50% of Baseline Count/m³		

\*The Baseline Level (100%) represents the average baseline sample counts. Counts above the baseline may indicate higher than expected levels of a given result.



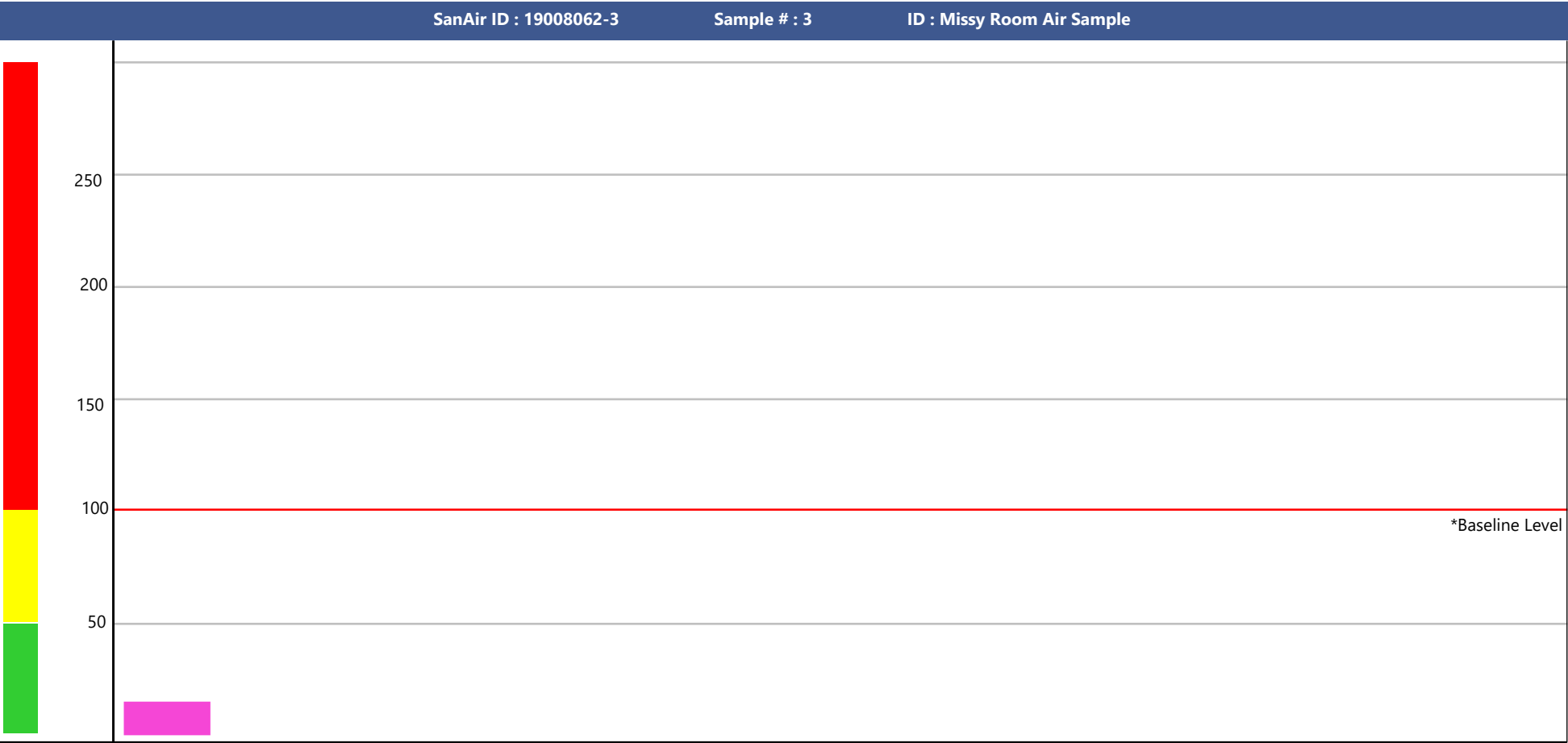
**Name:** Environmental Testing & Training Northwest  
**Address:** 2266 McGilchrist St SE #220  
 Salem, OR 97302  
**Phone:** 541-870-4331

**Project Number:** Eddyville Sch Rd  
**P.O. Number:** 2190081  
**Project Name:** Eddyville CS  
**Collected Date:** 2/20/2019  
**Received Date:** 2/22/2019 9:40:00 AM

SanAir ID Number  
**19008062**  
 FINAL REPORT  
 2/22/2019 12:15:32 PM

Analyst: Pulliam, Tashema

### Air Cassette Analysis - Spores % of Exterior Air



Count/m³ higher than Baseline	Basidiospores
Count/m³ comparable to Baseline	
Within 50% of Baseline Count/m³	

\*The Baseline Level (100%) represents the average baseline sample counts. Counts above the baseline may indicate higher than expected levels of a given result.



**Name:** Environmental Testing & Training Northwest  
**Address:** 2266 McGilchrist St SE #220  
 Salem, OR 97302  
**Phone:** 541-870-4331

**Project Number:** Eddyville Sch Rd  
**P.O. Number:** 2190081  
**Project Name:** Eddyville CS  
**Collected Date:** 2/20/2019  
**Received Date:** 2/22/2019 9:40:00 AM

SanAir ID Number  
**19008062**  
 FINAL REPORT  
 2/22/2019 12:15:32 PM

Analyst: Pulliam, Tashema

### Air Cassette Analysis - Spores % of Exterior Air



- Count/m³ higher than Baseline
- Count/m³ comparable to Baseline
- Within 50% of Baseline Count/m³

■ Basidiospores

\*The Baseline Level (100%) represents the average baseline sample counts. Counts above the baseline may indicate higher than expected levels of a given result.



**Name:** Environmental Testing & Training Northwest  
**Address:** 2266 McGilchrist St SE #220  
Salem, OR 97302  
**Phone:** 541-870-4331

**Project Number:** Eddyville Sch Rd  
**P.O. Number:** 2190081  
**Project Name:** Eddyville CS  
**Collected Date:** 2/20/2019  
**Received Date:** 2/22/2019 9:40:00 AM

## Organism Descriptions

*The descriptions of the organisms presented are derived from various reference materials. The laboratory report is based on the data derived from the samples submitted and no interpretation of the data, as to potential, or actual, health effects resulting from exposure to the numbers of organisms found, can be made by laboratory personnel. Any interpretation of the potential health effects of the presence of this organism must be made by qualified professional personnel with first hand knowledge of the sample site, and the problems associated with that site.*

**Mycelial Fragments** - A mycelium (plural = mycelia) is the "body" of a fungus. It is a collective term for hyphae (singular = hypha), which are the tubular units of the mycelium usually composed of chitin. The terms hyphae and mycelial fragments are used interchangeably. [This information was referenced from the mycology text "The Fifth Kingdom"] In some cases a fungal identification cannot be obtained due to lack of sporulation. Only the mycelial fragments are present, and cannot be identified without the distinguishing characteristics of the spores or the structures they grow from.

**Health Effects:** Allergic reactions may occur in the presence of spores (conidia) or mycelial/hyphal fragments.

**Ascospores** - From the fungal Subphylum Ascomycotina. Ascospores are ubiquitous in nature and are commonly found in the outdoor environment. This class contains the "sac fungi" and yeasts. Some ascospores can be identified by spore morphology, however; some care should be exercised with regard to specific identification. They are identified on tape lifts and non-viable analysis by the fact that they have no attachment scars and are sometimes enclosed in sheaths with or without sacs. Ascomycetes may develop both sexual and asexual stages. Rain and high humidity may help asci to release, and disperse ascospores, which is why during these weather conditions there is a great increase in counts.

**Health Effects:** This group contains possible allergens.

**Aspergillus/Penicillium** - These spores are easily aerosolized. Only through the visualization of reproductive structures can the genera be distinguished. Also included in this group are the spores of the genera Acremonium, Phialophora, Verticillium, Paecilomyces, etc. Small, round spores of this group lack the necessary distinguishing characteristics when seen on non-viable examination.

**Health Effects:** Can cause a variety of symptoms including allergic reactions. Most symptoms occur if the individual is immunocompromised in some way (HIV, cancer, etc). Both Penicillium and Aspergillus spores share similar morphology on non-viable analysis and therefore are lumped together into the same group.

**Basidiospores** - From the Subphylum Basidiomycotina which contains the mushrooms, shelf fungi, and a variety of other macrofungi. They are saprophytes, ectomycorrhizal fungi or agents of wood rot, which may destroy the structure wood of buildings. It is extremely difficult to identify a specific genera of mushrooms by using standard culture plate techniques. Some basidiomycete spores can be identified by spore morphology; however, some care should be exercised with regard to specific identification. The release of basidiospores is dependant upon moisture, and they are dispersed by wind.

**Health Effects:** Many have the potential to produce a variety of toxins. Members of this group may trigger Type I and III fungal hypersensitivity reactions. Rarely reported as opportunistic pathogens.

**Cladosporium species** - The most commonly identified outdoor fungus. The outdoor numbers are reduced in the winter and are often high in the summer. Often found indoors in numbers less than outdoor numbers. It is commonly found on the surface of fiberglass duct liner in the interior of supply ducts. A wide variety of plants are food sources for this fungus. It is found on dead plants, woody plants, food, straw, soil, paint and textiles. Often found in dirty refrigerators and especially in reservoirs where condensation is collected, on moist window frames it can easily be seen covering the whole painted area with a velvety olive green layer.

**Health Effects:** It is a common allergen. It can cause mycosis. Common cause of extrinsic asthma (immediate-type hypersensitivity: type I). Acute symptoms include edema and bronchospasms, chronic cases may develop pulmonary emphysema. Illnesses caused by this genus can include phaeohyphomycosis, chromoblastomycosis, hay fever and common allergies.

**References:** Flannigan, Brian, Robert A. Samson, and J. David Miller, eds. Microorganisms in Home and Indoor Work Environments: Diversity, Health Impacts, Investigation, and Control. London and New York: Taylor & Francis, 2001.



SanAir ID Number  
19008062  
FINAL REPORT  
2/22/2019 12:15:32 PM

**Name:** Environmental Testing & Training Northwest  
**Address:** 2266 McGilchrist St SE #220  
Salem, OR 97302  
**Phone:** 541-870-4331

**Project Number:** Eddyville Sch Rd  
**P.O. Number:** 2190081  
**Project Name:** Eddyville CS  
**Collected Date:** 2/20/2019  
**Received Date:** 2/22/2019 9:40:00 AM

## Organism Descriptions

*The descriptions of the organisms presented are derived from various reference materials. The laboratory report is based on the data derived from the samples submitted and no interpretation of the data, as to potential, or actual, health effects resulting from exposure to the numbers of organisms found, can be made by laboratory personnel. Any interpretation of the potential health effects of the presence of this organism must be made by qualified professional personnel with first hand knowledge of the sample site, and the problems associated with that site.*

**Smuts/Myxomycetes** - Smuts and Myxomycetes are parasitic plant pathogens. They are typically grouped together due to their association with plants, the outdoors and because they share similar microscopic morphology.

*Health Effects:* Can produce type I fungal hypersensitivity reactions.

*References:* Martin, G.W., C.J. Alexopoulos, and M.L. Farr. The Genera of Myxomycetes. Iowa City, Iowa: University of Iowa Press, 1983.

**Ulocladium species** - Isolated from soil, dead plants and cellulose materials. Found on textiles. It can be found on many types of materials, but mostly found on decaying materials. Has a greater water activity need for growth and is therefore considered a water indicator organism.

*Health Effects:* Reported to be a major allergen. Rarely causes subcutaneous infections in humans. It has a high water requirement.

*References:* De Hoog, G.S., J. Guarro, J. Gene, and M.J. Figueras. Atlas of Clinical Fungi, 2nd Edition. The Netherlands: CBS, 2000.

## Additional Information

### Air Cassette Analyses

Air cassette reports indicate the genus and concentration of viable (living) and non-viable mold spores detected on the slide (A2 Analysis). Whether or not these spores are viable cannot be determined using this type of analysis. However, keep in mind that spores can remain allergenic even after cellular death. Other possible allergens include dander, pollen and fibers which are included in air cassette reports for the A1 Analysis. A1 and A2 analyses are performed on several types of air cassettes. Light microscopy at a 400 to 1000x magnification is used for air cassette sample analysis. SanAir always analyzes 100% of the impacted slide.

### Explanation of Background Densities

The background density of an air cassette aids in the overall interpretation of results as it indicates the level of background debris present (e.g. dander, pollen, fibers, insect parts, soot, fly ash, etc.). Excessive background debris may mask the presence of fungal spores thereby reducing the accuracy of the count. It may also serve as an alert that the volume of air pulled was too high or too low. The following table explains background densities.

<b>Air Cassette Density</b>	<b>Amount of Particulate on Slide</b>	<b>Explanation</b>
1	Insignificant	Should not skew any counts
1+	Low	Should not skew any counts
2	Low to Moderate	Should not skew any counts
2+	Moderate to High	May cause occlusion of small spores
3	High	May cause occlusion of small to medium spores
3+	Very High	Will cause occlusion of spores
4	Overloaded	Level of particulate too high to perform analysis

### A Note About the Fungal Spores

In some instances certain groups of fungi cannot be identified due to a lack of distinguishing characteristics. These fungi will be categorized as %unknown spores+on the final report.

The genera *Aspergillus* and *Penicillium* are typically composed of small, round spores that are difficult to distinguish from each other; therefore, they are grouped into the category *Aspergillus / Penicillium*. Other fungi that produce spores of similar characteristics may also be placed into this category, including *Paecilomyces*, *Gliocladium*, and *Trichoderma*, among others.

*Stachybotrys* and *Memmoniella* spores are coated with a sticky %lime+layer that may inhibit aerosolization.

Any genus of fungi detected on an air cassette with a high raw count (i.e. exceeding 500 spores) may be estimated. Any estimate higher than 12,000 spores will be reported as >12,000.

### Understanding the Air Cassette Report

Each sample has 3 columns of information provided. The left is the raw count which is the number of spores for that fungal type detected on the trace. The middle column is the count per cubic meter (Count/m<sup>3</sup>) which is the raw count converted based on the total volume pulled for that sample. It represents the number of spores that should be expected in a cubic meter of air from the location in question *if* the spores were distributed evenly throughout the air. This column is helpful for interpreting results when the samples were pulled at different total volumes. In other words, the raw count of a cassette pulled at 75 liters should not be compared to the raw count of a cassette pulled at 150 liters because there may be higher counts associated with the higher volume. By comparing the %Count/m<sup>3</sup>+columns the difference in volumes are accounted for.

The limit of detection is the lowest spore count detectable with reasonable certainty, and it is calculated this way using a raw count of one. Keep in mind there are 1,000 liters in a cubic meter.

$$1 \times (1,000 / \text{Total Volume in Liters})$$

How to calculate the count per cubic meter:

$$\text{Raw Count} \times (1,000 / \text{Total Volume in Liters})$$

The last column on the right shows the percentage for which each spore type comprised the total spore count.

### **Understanding the Air Cassette Graph (If included in the final report)**

The graph is a visual representation of the baseline sample (usually the outdoor air sample) compared individually against each indoor sample. Each spore type found on the indoor sample is compared to what was found outdoors per cubic meter.

The graph shows the percentile representation of each indoor spore count derived by dividing the indoor Count/m<sup>3</sup> by the outdoor Count/m<sup>3</sup>. If the percentage is below 50% of the outside count, then the bar is below 50 on the chart, which corresponds to %Within 50% of Baseline Count/m<sup>3</sup>.+ If the percentage is between 50 and 100%, then the bar on the chart will stop between 50 and 100, which corresponds to %Count/m<sup>3</sup> comparable to Baseline.+ If the percentage is greater than 100%, then the bar will be above 100 on the chart, which corresponds to %Count/m<sup>3</sup> higher than Baseline.+

Each organism is given a threshold level for the Count/m<sup>3</sup>. If this threshold level is not met in an inside sample, then the organism will not be graphed on the chart. This is used to prevent the graph from showing every spore type that is commonly found outside and doesn't typically indicate a possible moisture problem inside. For example, most common outdoor spores (e.g. ascospores, basidiospores, and *Cladosporium*) have a threshold level of 100. Therefore, in order to show up on the chart, the inside Count/m<sup>3</sup> must be above 100. On the other hand, fungi that may indicate water damage (e.g. *Stachybotrys*, *Ulocladium*, *Chaetomium*, *Memnoniella*, etc.) are given lower threshold levels. These fungi have a higher water activity value and therefore require more moisture to grow. *Stachybotrys* and *Chaetomium* have threshold values of 14 and 30, respectively, as even a low count of those types of spores may indicate an issue with excess moisture.

Keep in mind that this graph is to be used only as a tool in the inspection of a building. Visual examination and knowledge of water damage, past remediation, and weather conditions, among other elements, is essential in the decision regarding the indoor air quality of a building.

### **Assistance with Remediation Projects**

\*\*more information pertaining to interpretation of results is available on our website [www.sanair.com](http://www.sanair.com)\*\*

For assistance in a remediation project you may consult the Institute of Inspection, Cleaning and Restoration Certification (IICRC) S500 and S520 protocols. The S500 is a reference guide for water-damage restoration and the S520 pertains specifically to mold remediation. Other standards and guidelines regarding Indoor Air Quality that may assist in remediation projects:

- AIHA (Recognition, Evaluation, and Control of Indoor Mold)
- AIHA (The Facts About Mold)
- NADCA (ACR 2006)
- IESO (Standards of Practice for the Assessment of Indoor Air Quality)
- EPA (Mold Remediation in Schools and Commercial Buildings)
- New York City Department of Health and Mental Hygiene (Guidelines on Assessment and Remediation of Fungi in Indoor Environments)



## **Disclaimer**

*SanAir Technologies Laboratory does not make contamination corrections to reports based upon analysis of laboratory and/or field blanks.*

*This report is the sole property of the client named on the SanAir Technologies Laboratory chain-of-custody. Neither results nor reports will be discussed with or released to any third party without our client's written permission. The information provided in this report applies only to the samples submitted and is relevant only for the date, time and location of sampling. SanAir assumes no responsibility for the method of sample procurement. Evaluation reports are based solely on the sample(s) in the condition in which they arrived at the laboratory and on the information provided by the client on the COC. SanAir will not provide any opinion on the safety of a building as visual inspection and knowledge of water damage, past remediation and weather conditions during sampling, among other elements, is essential in this decision. All samples are disposed of after 90 days unless otherwise requested by the client. SanAir is accredited by AIHA-LAP, LLC in the EMLAP program. Refer to our accreditation certificate or [www.aihaaccreditedlabs.org](http://www.aihaaccreditedlabs.org) for an up to date list of the Fields of Testing for which we are accredited.*

*This report does not constitute endorsement by AIHA-LAP, LLC/NVLAP and/or any other U.S. governmental agencies; and may not be certified by every local, state and federal regulatory agency.*

# SanAir Technologies Laboratory, Inc.

1551 Oakbridge Drive, Suite B - Powhatan, VA 23139  
 804-897-1177 / 888-895-1177 / Fax 804-897-0070  
 www.sanair.com

## Microbiology Chain of Custody

SanAir ID Number  
 19008062

Company: Environmental Testing & Training NW	Project Number: 1 EDDYVILLE SCH RD	Phone #: 541.870.4331
Address: 2266 McGilchrist Street SE #220	Project Name: EDDYVILLE CS	Phone #:
City, State, Zip: Salem, OR 97302	Date Collected: 2.20.19	Fax #:
Samples Collected By: Jim SAMTER	P.O. Number: 2190081	Email: Jim@ETTnw.com

Sample Types	Analysis Types	Turn Around Time
AC Air Cassette	A1 - Identification and Enumeration of Fungal spores, plus total dander, fiber, and pollen count	Hours 3/6/24/48-Std
	A2 - Identification and Enumeration of Fungal spores only	Hours 3/6/24/48-Std
T B S* Tape Bulk Swab*	D1 - Direct Identification of Fungi	Hours 3/6/24/48-Std
	D2 - Direct Identification of Mites, Insects, Pollen, etc.	Hours 3/6/24/48-Std
AP B S Air Plate Bulk Swab	C1 - Culture Identification and Enumeration of Fungi only	5-10 Days
	C2 - Culture Identification and Enumeration of Bacteria only	2-4 Days
	C3 - Culture Identification and Enumeration of Fungi and Bacteria	5-10 Days
	C4 - Culture Identification and Enumeration of Thermophilic Bacteria with C2 or C3 analysis	2-4 or 5-10 Days
W Water	L1 - Culture Identification and Enumeration of Legionella sp.	7-10 Days
D Dust	M1 - Dust Mite Allergen Test	Hours 3/6/24/48-Std

SanAir Technologies Laboratory offers speciation by PCR. Please call for details and pricing.

Sample #	Sample Identification	Sample Type	Analysis Type(s)	Turn Around Time	Total Volume (L) or Area (in <sup>2</sup> )	Time Start - Stop
1	EXTERIOR AIR SAMPLE	AC	A2	6HR	75 L	
2	WORK ROOM AIR SAMPLE	/	/	/	/	
3	MISS/ROOM AIR SAMPLE	/	/	/	/	
4	JENNIFER ROOM AIR SAMPLE	/	/	/	/	

Special Instructions

Relinquished by	Date	Time	Received by	Date	Time
Jim SAMTER	2.21.19	1:00 PM	MC	FEB 22 2019	9:40 AM

Unless scheduled, the turn around time for all samples received after 3 pm Friday will begin at 8 am Monday morning. Weekend or Holiday work must be scheduled ahead of time and is charged 150% of analytical rate.

\*Although we allow Direct Identification from a swab sample, best results are received from tape samples.