

SanAir Technologies Laboratory

Analysis Report

prepared for

Tattvam Environmental And Engineering Solutions

Report Date: 11/14/2016
Project Name: IAQ West Public
Schools
Project #: 16-101
SanAir ID#: 16040758



NVLAP LAB CODE 200870-0



Certification # 652931



License # LAB0166



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SanAir Technologies Laboratory, Inc.

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Web: <http://www.sanair.com> E-mail: iaq@sanair.com

**Tattvam Environmental And Engineering Solutions
11 Park Lane
Trumbull, CT 06611**

November 14, 2016

SanAir ID # 16040758
Project Name: IAQ West Public Schools
Project Number: 16-101

Dear Indu Nambiar,

We at SanAir would like to thank you for the work you recently submitted. The 24 sample(s) were received on Wednesday, November 09, 2016 via FedEx. The final report(s) is enclosed for the following sample(s): 1., 2., 3., 4., 5., 6., 7., 8., 9., 10., 11., 12., 13, 14, 15, 16., 17., 18, 19., 20, 21, 22, 23, 24.

These results only pertain to this job and should not be used in the interpretation of any other job. This report is only complete in its entirety. Refer to the listing below of the pages included in a complete final report.

Sincerely,

L. Claire Macdonald
Microbiology Laboratory Manager
SanAir Technologies Laboratory

Final Report Includes:

- Cover Letter
- Analysis Pages
- Disclaimers and Additional Information

sample conditions:

24 sample(s) in Good condition



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SanAir ID Number

16040758

FINAL REPORT

Name: Tattvam Environmental And Engineering
Address: Solutions
11 Park Lane
Trumbull, CT 06611

Project Number: 16-101
P.O. Number:
Project Name: IAQ West Public Schools

Collected Date: 11/5/2016
Received Date: 11/9/2016 12:50:00 PM
Report Date: 11/14/2016 11:42:19 AM
Analyst: Goodwin, Aaron M.

Air Cassette Analysis

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

SanAir ID Number	16040758-001			16040758-002			16040758-003			16040758-004		
Analysis Using STL:	105C			105C			105C			105C		
Sample Number	1.			2.			3.			4.		
Sample Identification	Elem - Learning Resource			Elem - Stage/ Cafeteria Near Kitchen			Elem - N12 - Mr. Gerestin			Elem - Grade 1 And 2 Team Room		
Sample Type	Air Cassette - Air-O-Cell			Air Cassette - Air-O-Cell			Air Cassette - Air-O-Cell			Air Cassette - Air-O-Cell		
Volume	150 Liters			150 Liters			150 Liters			150 Liters		
Analytical Sensitivity	7 Count/M ³			7 Count/M ³			7 Count/M ³			7 Count/M ³		
Background Density	1+			1+			2			1+		
Other	Raw Count	Count/M³	%	Raw Count	Count/M³	%	Raw Count	Count/M³	%	Raw Count	Count/M³	%
Dander	33	220	n/a	23	153	n/a	150	1000	n/a	150	1000	n/a
Fibers	3	20	n/a	1	7	n/a	5	33	n/a	3	20	n/a
Mycelial Fragments	1	7	n/a									
Fungal Identification	Raw Count	Count/M³	%	Raw Count	Count/M³	%	Raw Count	Count/M³	%	Raw Count	Count/M³	%
Alternaria species				1	7	2						
Ascospores				1	7	2	1	7	3	1	7	3
Aspergillus/Penicillium	1	7	8	2	13	4				4	27	11
Basidiospores	9	60	69	26	173	58	13	87	35	26	173	72
Bispora species												
Chaetomium species												
Cladosporium species	1	7	8	14	93	31	6	40	16			
Curvularia species							5	33	14			
Epicoccum species												
Nigrospora species												
Pithomyces species	1	7	8				6	40	16	2	13	6
Rusts	1	7	8				2	13	5	1	7	3
Smuts/Myxomycetes				1	7	2	4	27	11	2	13	6
Stemphylium species												
Total	13	87		45	300		37	247		36	240	

Signature:

Date: 11/14/2016

Reviewed:

Date: 11/14/2016



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SanAir ID Number	16040758-005			16040758-006			16040758-007			16040758-008		
Analysis Using STL:	105C			105C			105C			105C		
Sample Number	5.			6.			7.			8.		
Sample Identification	Elem - Hallway O/ S Main Office			O/ S Ambient			Inter. - O/ S Rm 117			Inter - Library		
Sample Type	Air Cassette - Air-O-Cell			Air Cassette - Air-O-Cell			Air Cassette - Air-O-Cell			Air Cassette - Air-O-Cell		
Volume	150 Liters			150 Liters			150 Liters			150 Liters		
Analytical Sensitivity	7 Count/M ³			7 Count/M ³			7 Count/M ³			7 Count/M ³		
Background Density	1+			1+			2			1+		
Other	Raw Count	Count/M³	%	Raw Count	Count/M³	%	Raw Count	Count/M³	%	Raw Count	Count/M³	%
Dander	120	800	n/a	3	20	n/a	96	640	n/a	22	147	n/a
Fibers	3	20	n/a	1	7	n/a	2	13	n/a	2	13	n/a
Mycelial Fragments							1	7	n/a	1	7	n/a
Fungal Identification	Raw Count	Count/M³	%	Raw Count	Count/M³	%	Raw Count	Count/M³	%	Raw Count	Count/M³	%
Alternaria species	1	7	< 1									
Ascospores	4	27	4	2	13	< 1	1	7	6			
Aspergillus/Penicillium	2	13	2	37	247	10						
Basidiospores	40	267	39	210	1400	57	9	60	50	5	33	29
Bispora species	1	7	< 1									
Chaetomium species	1	7	< 1									
Cladosporium species	41	273	40	90	600	24	2	13	11	12	80	71
Curvularia species	1	7	< 1				2	13	11			
Epicoccum species				2	13	< 1						
Nigrospora species				1	7	< 1						
Pithomyces species	3	20	3				2	13	11			
Rusts	1	7	< 1	2	13	< 1	1	7	6			
Smuts/Myxomycetes	7	47	7	23	153	6	1	7	6			
Stemphylium species				1	7	< 1						
Total	102	680		368	2453		18	120		17	113	

Signature:

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Analyst: Goodwin, Aaron M.

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SanAir ID Number	16040758-009			16040758-010			16040758-011			16040758-012		
Analysis Using STL:	105C			105C			105C			105C		
Sample Number	9.			10.			11.			12.		
Sample Identification	Inter - Ms. Adigna's Class			Inter - Rm 219			Inter - Rm 210			H.S - B1 - Seminar 2		
Sample Type	Air Cassette - Air-O-Cell			Air Cassette - Air-O-Cell			Air Cassette - Air-O-Cell			Air Cassette - Air-O-Cell		
Volume	150 Liters			150 Liters			150 Liters			150 Liters		
Analytical Sensitivity	7 Count/M ³			7 Count/M ³			7 Count/M ³			7 Count/M ³		
Background Density	1+			1+			2			1+		
Other	Raw Count	Count/M³	%	Raw Count	Count/M³	%	Raw Count	Count/M³	%	Raw Count	Count/M³	%
Dander	70	467	n/a	98	653	n/a	127	847	n/a	53	353	n/a
Fibers	11	73	n/a	3	20	n/a	3	20	n/a	2	13	n/a
Mycelial Fragments												
Fungal Identification	Raw Count	Count/M³	%	Raw Count	Count/M³	%	Raw Count	Count/M³	%	Raw Count	Count/M³	%
Alternaria species												
Ascospores	1	7	6									
Aspergillus/Penicillium	2	13	11	2	13	8						
Basidiospores	13	87	72	12	80	50	1	7	50	2	13	67
Bispora species												
Chaetomium species												
Cladosporium species	1	7	6	6	40	25				1	7	33
Curvularia species				1	7	4						
Epicoccum species												
Nigrospora species												
Pithomyces species				1	7	4	1	7	50			
Rusts				1	7	4						
Smuts/Myxomycetes	1	7	6	1	7	4						
Stemphylium species												
Total	18	120		24	160		2	13		3	20	

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Analyst: Goodwin, Aaron M.

Air Cassette Analysis

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SanAir ID Number	16040758-013			16040758-014			16040758-015			16040758-016		
Analysis Using STL:	105C			105C			105C			105C		
Sample Number	13			14			15			16.		
Sample Identification	H.S - Auditorium			H.S - Library			H.S - G. Wing Science Class			H.S - D-4		
Sample Type	Air Cassette - Air-O-Cell			Air Cassette - Air-O-Cell			Air Cassette - Air-O-Cell			Air Cassette - Air-O-Cell		
Volume	150 Liters			150 Liters			150 Liters			150 Liters		
Analytical Sensitivity	7 Count/M ³			7 Count/M ³			7 Count/M ³			7 Count/M ³		
Background Density	1+			1+			1+			1+		
Other	Raw Count	Count/M³	%	Raw Count	Count/M³	%	Raw Count	Count/M³	%	Raw Count	Count/M³	%
Dander	33	220	n/a	36	240	n/a	26	173	n/a	12	80	n/a
Fibers	1	7	n/a	1	7	n/a	2	13	n/a	1	7	n/a
Mycelial Fragments												
Fungal Identification	Raw Count	Count/M³	%	Raw Count	Count/M³	%	Raw Count	Count/M³	%	Raw Count	Count/M³	%
Alternaria species												
Ascospores							2	13	14			
Aspergillus/Penicillium												
Basidiospores	14	93	88				9	60	64	3	20	>99
Bispora species												
Chaetomium species												
Cladosporium species							3	20	21			
Curvularia species												
Epicoccum species												
Nigrospora species												
Pithomyces species	1	7	6									
Rusts												
Smuts/Myxomycetes	1	7	6									
Stemphylium species												
Total	16	107					14	93		3	20	

Signature:

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Analyst: Goodwin, Aaron M.

Air Cassette Analysis

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SanAir ID Number	16040758-017			16040758-018			16040758-019			16040758-020		
Analysis Using STL:	105C			105C			105C			105C		
Sample Number	17.			18			19.			20		
Sample Identification	O/ S Cafeteria In Vending - H.S			Gymnasim			Middle School			Cafeteria - Middle School		
Sample Type	Air Cassette - Air-O-Cell			Air Cassette - Air-O-Cell			Air Cassette - Air-O-Cell			Air Cassette - Air-O-Cell		
Volume	150 Liters			150 Liters			150 Liters			150 Liters		
Analytical Sensitivity	7 Count/M ³			7 Count/M ³			7 Count/M ³			7 Count/M ³		
Background Density	2			1+			1+			1+		
Other	Raw Count	Count/M³	%	Raw Count	Count/M³	%	Raw Count	Count/M³	%	Raw Count	Count/M³	%
Dander	240	1600	n/a	3	20	n/a	12	80	n/a	34	227	n/a
Fibers	5	33	n/a	1	7	n/a	15	100	n/a	1	7	n/a
Mycelial Fragments												
Fungal Identification	Raw Count	Count/M³	%	Raw Count	Count/M³	%	Raw Count	Count/M³	%	Raw Count	Count/M³	%
Alternaria species												
Ascospores										1	7	5
Aspergillus/Penicillium	10	67	34									
Basidiospores	11	73	38	11	73	92	34	227	85	15	100	75
Bispora species												
Chaetomium species												
Cladosporium species	3	20	10	1	7	8	6	40	15	2	13	10
Curvularia species												
Epicoccum species												
Nigrospora species												
Pithomyces species	4	27	14									
Rusts												
Smuts/Myxomycetes	1	7	3							2	13	10
Stemphylium species												
Total	29	193		12	80		40	267		20	133	

Signature:

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Report Date: 11/14/2016 11:42:19 AM
Analyst: Goodwin, Aaron M.

Air Cassette Analysis

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

SanAir ID Number	16040758-021			16040758-022			16040758-023			16040758-024		
Analysis Using STL:	105C			105C			105C			105C		
Sample Number	21			22			23			24		
Sample Identification	Middle School - Library			Middle School - Team Disc Hall			A06 - Middle School			A Win 6-03		
Sample Type	Air Cassette - Air-O-Cell			Air Cassette - Air-O-Cell			Air Cassette - Air-O-Cell			Air Cassette - Air-O-Cell		
Volume	150 Liters			150 Liters			150 Liters			150 Liters		
Analytical Sensitivity	7 Count/M ³			7 Count/M ³			7 Count/M ³			7 Count/M ³		
Background Density	1+			2			1+			1+		
Other	Raw Count	Count/M³	%	Raw Count	Count/M³	%	Raw Count	Count/M³	%	Raw Count	Count/M³	%
Dander	34	227	n/a	37	247	n/a	29	193	n/a	6	40	n/a
Fibers	1	7	n/a	17	113	n/a	1	7	n/a	8	53	n/a
Mycelial Fragments	1	7	n/a									
Fungal Identification	Raw Count	Count/M³	%	Raw Count	Count/M³	%	Raw Count	Count/M³	%	Raw Count	Count/M³	%
Alternaria species												
Ascospores							2	13	2			
Aspergillus/Penicillium												
Basidiospores	3	20	>99	31	207	69	69	460	78	51	340	85
Bispora species												
Chaetomium species												
Cladosporium species				14	93	31	16	107	18	7	47	12
Curvularia species							1	7	1			
Epicoccum species												
Nigrospora species												
Pithomyces species												
Rusts												
Smuts/Myxomycetes							1	7	1	2	13	3
Stemphylium species												
Total	3	20		45	300		89	593		60	400	

Signature:

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FINAL REPORT

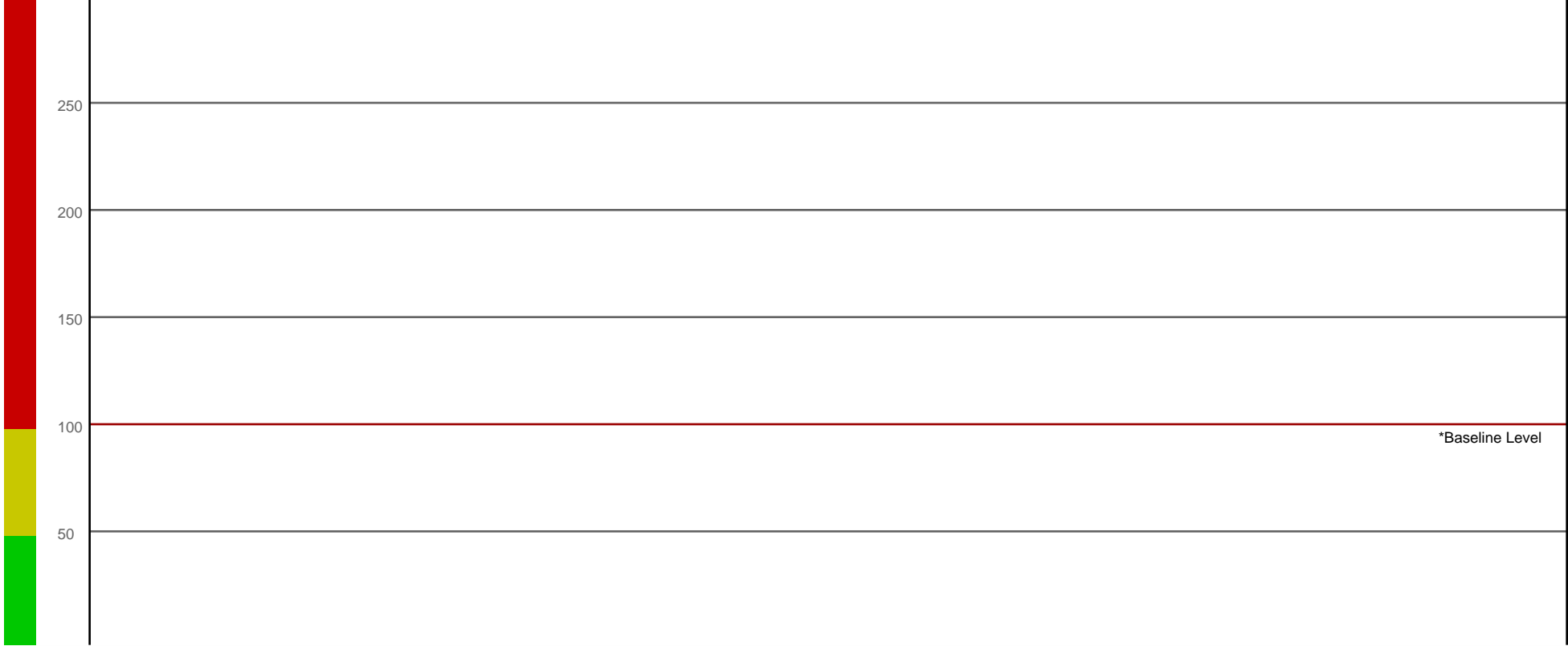
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Air Cassette Analysis - Spores % of Outside Air

SanAir ID : 16040758-1 Sample # : 1. ID : Elem - Learning Resource



Page 9 of 41

- Probable mold amplification
- Possible mold amplification
- No evidence of mold amplification

No organisms to graph. Normalized organism counts may not have exceeded the organism thresholds, or there were no organism counts for this sample. Please refer to the analysis report.

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



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Analyst: Goodwin, Aaron M.

Air Cassette Analysis - Spores % of Outside Air

SanAir ID : 16040758-2

Sample # : 2.

ID : Elem - Stage/ Cafeteria Near Kitchen



12%
A

- Probable mold amplification
- Possible mold amplification
- No evidence of mold amplification

■ A 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.



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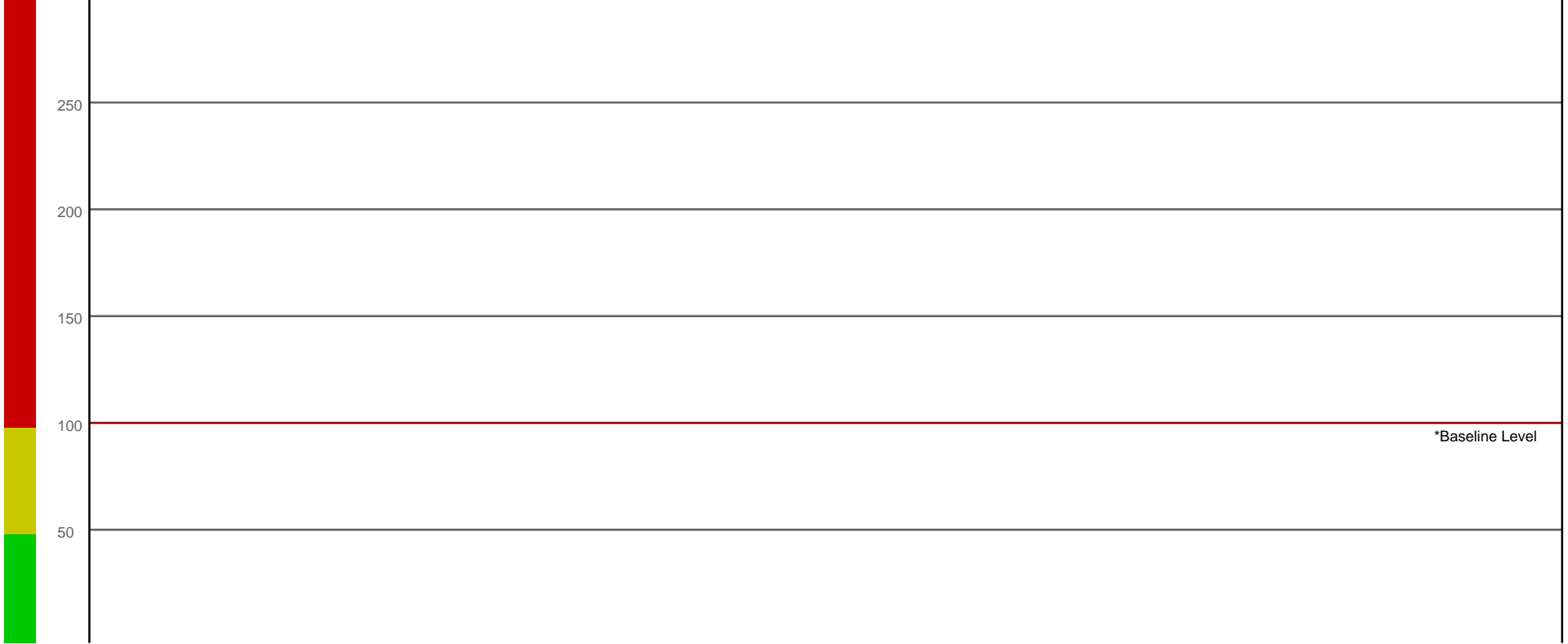
Collected Date: 11/5/2016
Received Date: 11/9/2016 12:50:00 PM
Report Date: 11/14/2016 11:42:19 AM
Analyst: Goodwin, Aaron M.

Air Cassette Analysis - Spores % of Outside Air

SanAir ID : 16040758-3

Sample # : 3.

ID : Elem - N12 - Mr. Gerestin



- Probable mold amplification
- Possible mold amplification
- No evidence of mold amplification

No organisms to graph. Normalized organism counts may not have exceeded the organism thresholds, or there were no organism counts for this sample. Please refer to the analysis report.

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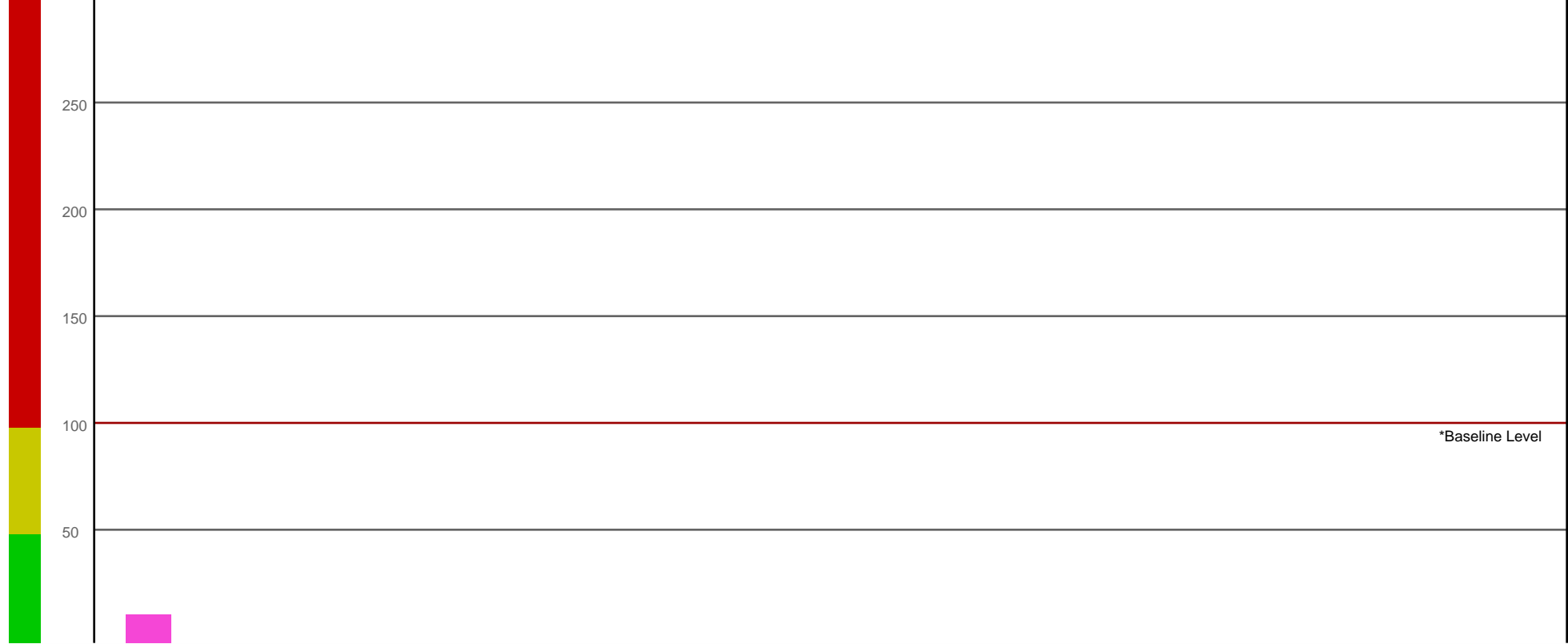
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Analyst: Goodwin, Aaron M.

Air Cassette Analysis - Spores % of Outside Air

SanAir ID : 16040758-4

Sample # : 4.

ID : Elem - Grade 1 And 2 Team Room



- Probable mold amplification
- Possible mold amplification
- No evidence of mold amplification

- Basidiospores

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Air Cassette Analysis - Spores % of Outside Air

SanAir ID : 16040758-5 Sample # : 5. ID : Elem - Hallway O/ S Main Office



- Probable mold amplification
- Possible mold amplification
- No evidence of mold amplification

- A Basidiospores
- B Cladosporium species

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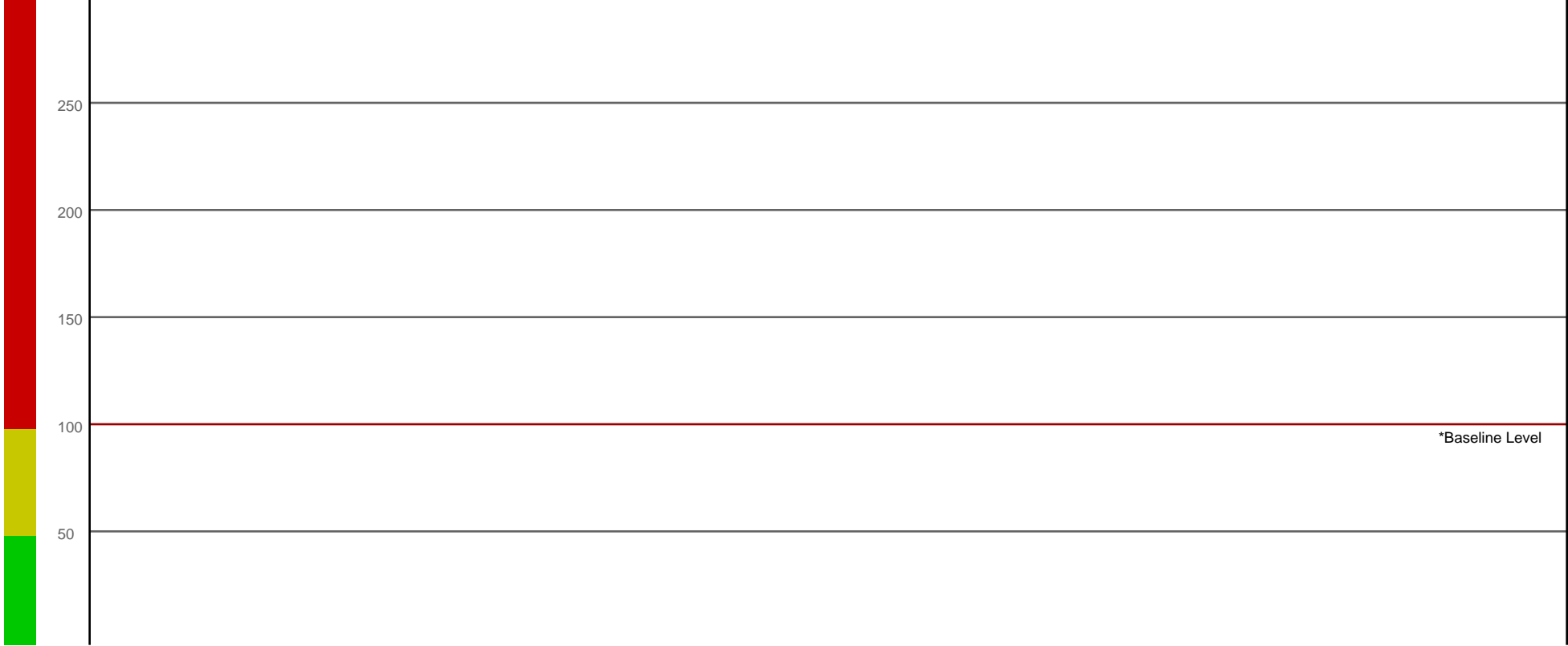
Collected Date: 11/5/2016
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Report Date: 11/14/2016 11:42:19 AM
Analyst: Goodwin, Aaron M.

Air Cassette Analysis - Spores % of Outside Air

SanAir ID : 16040758-7

Sample # : 7.

ID : Inter. - O/ S Rm 117



*Baseline Level

- Probable mold amplification
- Possible mold amplification
- No evidence of mold amplification

No organisms to graph. Normalized organism counts may not have exceeded the organism thresholds, or there were no organism counts for this sample. Please refer to the analysis report.

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16040758

FINAL REPORT

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Project Number: 16-101
P.O. Number:
Project Name: IAQ West Public Schools

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Analyst: Goodwin, Aaron M.

Air Cassette Analysis - Spores % of Outside Air

SanAir ID : 16040758-8 Sample # : 8. ID : Inter - Library



- Probable mold amplification
- Possible mold amplification
- No evidence of mold amplification

No organisms to graph. Normalized organism counts may not have exceeded the organism thresholds, or there were no organism counts for this sample. Please refer to the analysis report.

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Analyst: Goodwin, Aaron M.

Air Cassette Analysis - Spores % of Outside Air

SanAir ID : 16040758-9 Sample # : 9. ID : Inter - Ms. Adigna's Class



- Probable mold amplification
- Possible mold amplification
- No evidence of mold amplification

No organisms to graph. Normalized organism counts may not have exceeded the organism thresholds, or there were no organism counts for this sample. Please refer to the analysis report.

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Analyst: Goodwin, Aaron M.

Air Cassette Analysis - Spores % of Outside Air

SanAir ID : 16040758-10 Sample # : 10. ID : Inter - Rm 219



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- Probable mold amplification
- Possible mold amplification
- No evidence of mold amplification

No organisms to graph. Normalized organism counts may not have exceeded the organism thresholds, or there were no organism counts for this sample. Please refer to the analysis report.

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Analyst: Goodwin, Aaron M.

Air Cassette Analysis - Spores % of Outside Air

SanAir ID : 16040758-11 Sample # : 11. ID : Inter - Rm 210



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- Probable mold amplification
- Possible mold amplification
- No evidence of mold amplification

No organisms to graph. Normalized organism counts may not have exceeded the organism thresholds, or there were no organism counts for this sample. Please refer to the analysis report.

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Analyst: Goodwin, Aaron M.

Air Cassette Analysis - Spores % of Outside Air

SanAir ID : 16040758-12 Sample # : 12. ID : H.S - B1 - Seminar 2



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- Probable mold amplification
- Possible mold amplification
- No evidence of mold amplification

No organisms to graph. Normalized organism counts may not have exceeded the organism thresholds, or there were no organism counts for this sample. Please refer to the analysis report.

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Analyst: Goodwin, Aaron M.

Air Cassette Analysis - Spores % of Outside Air

SanAir ID : 16040758-13 Sample # : 13 ID : H.S - Auditorium



- Probable mold amplification
- Possible mold amplification
- No evidence of mold amplification

No organisms to graph. Normalized organism counts may not have exceeded the organism thresholds, or there were no organism counts for this sample. Please refer to the analysis report.

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Analyst: Goodwin, Aaron M.

Air Cassette Analysis - Spores % of Outside Air

SanAir ID : 16040758-14 Sample # : 14 ID : H.S - Library



- Probable mold amplification
- Possible mold amplification
- No evidence of mold amplification

No organisms to graph. Normalized organism counts may not have exceeded the organism thresholds, or there were no organism counts for this sample. Please refer to the analysis report.

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Analyst: Goodwin, Aaron M.

Air Cassette Analysis - Spores % of Outside Air

SanAir ID : 16040758-15 Sample # : 15 ID : H.S - G. Wing Science Class



- Probable mold amplification
- Possible mold amplification
- No evidence of mold amplification

No organisms to graph. Normalized organism counts may not have exceeded the organism thresholds, or there were no organism counts for this sample. Please refer to the analysis report.

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Analyst: Goodwin, Aaron M.

Air Cassette Analysis - Spores % of Outside Air

SanAir ID : 16040758-16 Sample # : 16. ID : H.S - D-4



- Probable mold amplification
- Possible mold amplification
- No evidence of mold amplification

No organisms to graph. Normalized organism counts may not have exceeded the organism thresholds, or there were no organism counts for this sample. Please refer to the analysis report.

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Analyst: Goodwin, Aaron M.

Air Cassette Analysis - Spores % of Outside Air

SanAir ID : 16040758-17 Sample # : 17. ID : O/ S Cafeteria In Vending - H.S



- Probable mold amplification
- Possible mold amplification
- No evidence of mold amplification

No organisms to graph. Normalized organism counts may not have exceeded the organism thresholds, or there were no organism counts for this sample. Please refer to the analysis report.

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Analyst: Goodwin, Aaron M.

Air Cassette Analysis - Spores % of Outside Air

SanAir ID : 16040758-18 Sample # : 18 ID : Gymnasim



- Probable mold amplification
- Possible mold amplification
- No evidence of mold amplification

No organisms to graph. Normalized organism counts may not have exceeded the organism thresholds, or there were no organism counts for this sample. Please refer to the analysis report.

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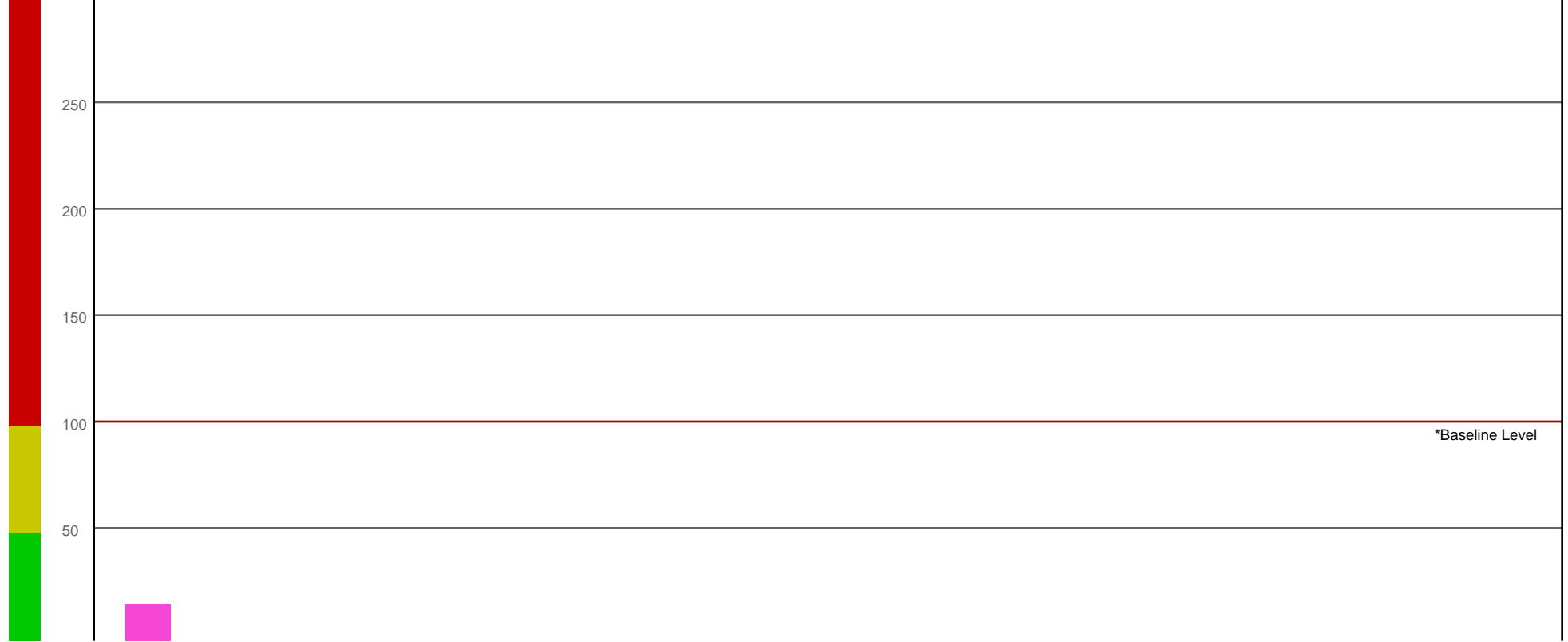
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Analyst: Goodwin, Aaron M.

Air Cassette Analysis - Spores % of Outside Air

SanAir ID : 16040758-19

Sample # : 19.

ID : Middle School



16%
A

- Probable mold amplification
- Possible mold amplification
- No evidence of mold amplification

■ A Basidiospores

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Analyst: Goodwin, Aaron M.

Air Cassette Analysis - Spores % of Outside Air

SanAir ID : 16040758-20 Sample # : 20 ID : Cafeteria - Middle School



7%
A

- Probable mold amplification
- Possible mold amplification
- No evidence of mold amplification

- Basidiospores

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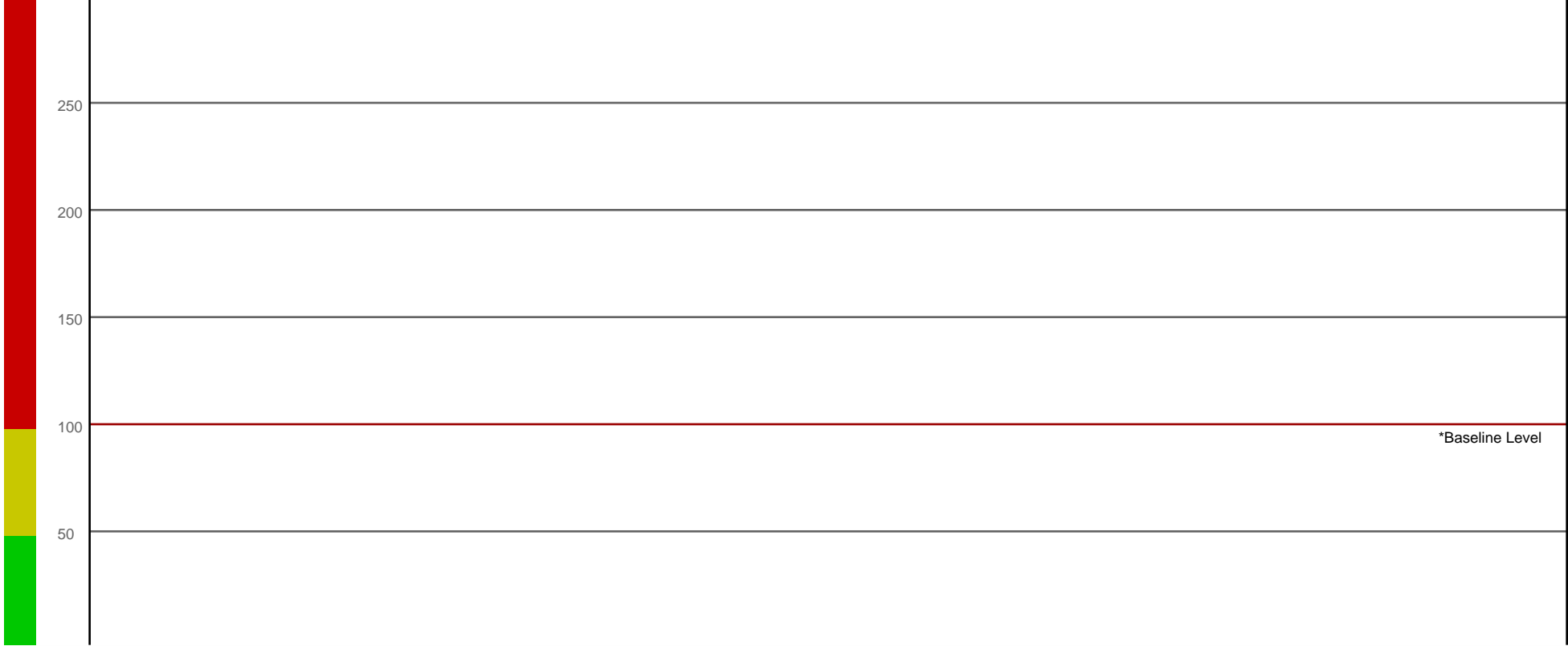
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Analyst: Goodwin, Aaron M.

Air Cassette Analysis - Spores % of Outside Air

SanAir ID : 16040758-21 Sample # : 21 ID : Middle School - Library



- Probable mold amplification
- Possible mold amplification
- No evidence of mold amplification

No organisms to graph. Normalized organism counts may not have exceeded the organism thresholds, or there were no organism counts for this sample. Please refer to the analysis report.

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Analyst: Goodwin, Aaron M.

Air Cassette Analysis - Spores % of Outside Air

SanAir ID : 16040758-22 Sample # : 22 ID : Middle School - Team Disc Hall



- Probable mold amplification
- Possible mold amplification
- No evidence of mold amplification

- Basidiospores

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Analyst: Goodwin, Aaron M.

Air Cassette Analysis - Spores % of Outside Air

SanAir ID : 16040758-23

Sample # : 23

ID : A06 - Middle School



33%
A

18%
B

- Probable mold amplification
- Possible mold amplification
- No evidence of mold amplification

- A Basidiospores
- B Cladosporium species

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Analyst: Goodwin, Aaron M.

Air Cassette Analysis - Spores % of Outside Air

SanAir ID : 16040758-24 Sample # : 24 ID : A Win 6-03



24%
A

- Probable mold amplification
- Possible mold amplification
- No evidence of mold amplification

- Basidiospores

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Report Date: 11/14/2016 11:42:19 AM
Macdonald, Claire

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.

DANDER - Comprised of human and/or animal skin cells. Counts may be higher in carpeted rooms and in rooms with more traffic. *Health Effects:* May cause allergies.

FIBERS - This category can include clothing, carpet, and insulation fibers.

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.

ALTERNARIA SPECIES - This genus comprises a large number of saprobes and plant pathogens. It is one of the predominate airborne fungal spores indoor and outdoor. Outdoors it may be isolated from samples of soil, seeds, and plants. It is one of the more common fungi found in nature, extremely widespread and ubiquitous. Conidia are easily carried by the wind, with peak concentrations in the summer and early fall. It is commonly found in outdoor samples. It is often found in indoor environments, on drywall, ceiling tiles, in house dust, carpets, textiles, and on horizontal surfaces in building interiors. Often found on window frames. *Health Effects:* In humans, it is recognized to cause type I and III allergic responses. Because of the large size of the spores, it can be deposited in the nose, mouth and upper respiratory tract, causing nasal septum infections. It has been known to cause Baker's asthma, farmer's lung, and hay fever. It has been associated with hypersensitivity pneumonitis, sinusitis, dermatomycosis, onychomycosis, subcutaneous phaeoerythromycosis, and invasive infection. Common cause of extrinsic asthma (immediate-type hypersensitivity: type I). Acute symptoms include edema and bronchospasms, chronic cases may develop pulmonary emphysema.

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.

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.



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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.

BISPORA SPECIES - Bispora is a ubiquitous anamorphic fungus and may be isolated from decaying wood. *Health Effects:* There has been no known research on the health effects, toxicity, or allergens to this fungi.

References: C.J. K. Wang, R.A. Zabel, Identification Manual for Fungi from Utility Poles in the Eastern United States, American Type Culture Collection 1990

CHAETOMIUM SPECIES - It is an ascomycete. It is found on a variety of substrates containing cellulose including paper and plant compost. It can be found on the damp or water damaged paper in sheetrock after a long term water damage. Several species have been reported to play a major role in decomposition of cellulose made materials. These fungi are able to dissolve the cellulose fibers in cotton and paper, and thus cause these materials to disintegrate. The process is especially rapid under moist conditions. *Health Effects:* Chaetomium can produce type I fungal hypersensitivity and has caused onychomycosis (nail infections).

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.

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 phaeoophycomycosis, 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.

CURVULARIA SPECIES - Curvularia is found on plant material and is considered a saprobe. It has also been isolated from dust samples and from wallpaper. *Health Effects:* It has been reported to cause type I hypersensitivity and to be a cause of allergic fungal sinusitis. It may cause corneal infections, mycetoma and infections in immune compromised hosts.

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

EPICOCCUM SPECIES - It is found in plants, soil, grains, textiles, and paper products. Frequently isolated from air and occasionally occurs in house dust. Is a saprophyte and considered a weakly parasitic secondary invader of plants, moldy paper and textiles. Epicoccum is usually isolated with either Cladosporium species or Aureobasidium species. *Health Effects:* A common allergen. It also has the potential to produce type I fungal hypersensitivity reactions.

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.

NIGROSPORA SPECIES - Has been isolated from air and soil samples. Usually found in plant material as a saprobe. *Health Effects:* It has been associated with type I allergic responses. No reported cases of infection.

References: St-Germain, Guy and Richard Summerbell. Identifying Filamentous Fungi: A Clinical Laboratory Handbook. California: Star Publishing Company., 1996.

PITHOMYCES SPECIES - Grows on dead grass in pastures and decaying plant material. *Health Effects:* Causes facial eczema in ruminants.

References: St-Germain, Guy, and Richard Summerbell. Identifying Filamentous Fungi: A Clinical Laboratory Handbook. California: Star Publishing Co., 1996.

RUSTS - From the group Uredinales, called Rusts due to the color of the spores, which are known for causing disease in



Name: Tattvam Environmental And Engineering
Address: Solutions
11 Park Lane
Trumbull, CT 06611

Project Number: 16-101
P.O. Number:
Project Name: IAQ West Public Schools
Collected Date: 11/5/2016
Received Date: 11/9/2016 12:50:00 PM
Report Date: 11/14/2016 11:42:19 AM
Macdonald, Claire

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.

plants.

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.

STEMPHYLIUM SPECIES - It is usually isolated from dead materials and is either parasitic or saprophytic. *Health Effects:* It has been reported to be a type I allergen and is considered a contaminant.

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.

Air Cassette Density	Amount of Particulate on Slide	Explanation
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 *Memnoniella* 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/m³) 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/m³" 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/m³ by the outdoor Count/m³. If the percentage is below 50% of the outside count, then the bar is below 50 on the chart, which corresponds to %No evidence of mold amplification.+ If the percentage is between 50 and 100%, then the bar on the chart will stop between 50 and 100, which corresponds to %Possible mold amplification.+ If the percentage is greater than 100%, then the bar will be above 100 on the chart, which corresponds to %Probable mold amplification.+

Each organism is given a threshold level for the Count/m³. 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/m³ 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

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 for Direct Examination of air samples.

This report does not constitute endorsement by AIHA-LAP/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.

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 804-897-1177 / 888-895-1177 / Fax 804-897-0070
 www.sanair.com

**Microbiology
 Chain of Custody**

SanAir ID Number 16049758

Company: <u>Tatram Environmental</u>	Project Number: <u>16-101</u>	Phone #: <u>203 8809767</u>
Address: <u>Trumbull, CT</u>	Project Name: <u>IAR West Public Schools</u>	Phone #:
City, State, Zip:	Date Collected: <u>Nov 5th</u>	Fax #:
Samples Collected By: <u>Indu/Katrina</u>	P.O. Number:	Email: <u>indu@tatram.com</u>

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 <i>Legionella sp.</i>	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 ²)	Time Start - Stop
1.	Elem - Learning Resource					
2.	Elem - stage kitchen					
3.	Elem - N 12 - Mr. Grestin					
4.	Elem - Grade 4 2 team room					
5.	Elem - Hallway o/s main office					
6.	o/s Ambrose					
7.	Inter - o/s Rm 117					
8.	Inter - Library					
9.	Inter - Ms. Adiguna's class					
10.	Inter - Rm 219					
11.	Inter - Rm 210					

Special Instructions

Relinquished by	Date	Time	Received by	Date	Time
<u>Indu</u>	<u>11/5</u>		<u>MC</u>	<u>NOV 09 2016</u>	<u>10:55AM</u>

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.

SanAir Technologies Laboratory, Inc.

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Microbiology Chain of Custody

SanAir ID Number
 1604058

Company: <i>Tattvam Environment</i>	Project Number: <i>16-101</i>	Phone #: <i>203 880 9767</i>
Address:	Project Name: <i>-IQR - Weston Public</i>	Phone #:
City, State, Zip:	Date Collected: <i>Nov 15</i>	Fax #:
Samples Collected By: <i>Indu Katina</i>	P.O. Number:	Email: <i>indu@tattvam.com</i>

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 <i>Legionella sp.</i>	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 ²)	Time Start - Stop
12	H.S → BI - Seminar 2	↓			150	
13	H.S → Auditorium					
14	H.S → Library					
15	H.S → Growing Science class					
16	H.S → D-4					
17	Old Cafeteria in Vending - H.S					
18	Gymnasium					
19	Middle school					
20	Cafeteria - Middle school					
21	Middle school - library					
22	Middle School - Team Disc Hall					
23	A06 - Middle school					
24	Awin 6-03					

Special Instructions

Relinquished by	Date	Time	Received by	Date	Time
<i>[Signature]</i>			<i>MC</i>	NOV 19 2016	10:55 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.

16040759

Maria E. Coker

From: Jordan L. Ridgeway
Sent: Wednesday, November 09, 2016 12:47 PM
To: Cheyenne E. Urbine; Elisa Moore; Maria E. Coker
Subject: FW: IAQ West Public Schools / 16-101 / Missing Test Type & Turn-Around Time

Jordan Ridgeway
Account Executive
SanAir Technologies Laboratory, Inc
1551 Oakbridge Drive, Suite B
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Phone: 804.897.1177
Phone: 888.895.1177
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From: Indu Nambiar [mailto:indu@tattvamgroup.com]
Sent: Wednesday, November 09, 2016 12:46 PM
To: Jordan L. Ridgeway <jridgeway@sanair.com>
Subject: Re: IAQ West Public Schools / 16-101 / Missing Test Type & Turn-Around Time

Method A1

Turn around - standard (72 hours?)

Indu Nambiar
Environmental Engineer
www.tattvamgroup.com
Phone: 203 880 9767

On Wed, Nov 9, 2016 at 12:35 PM, Jordan L. Ridgeway <jridgeway@sanair.com> wrote:

RE: IAQ West Public Schools / 16-101

MC

NOV 09 2016

12:59pm

16040758

SanAir #16040758

Hello,

Can you please provide a test method and turn-around time for the job above? Thanks.

Jordan Ridgeway

Account Executive

SanAir Technologies Laboratory, Inc

1551 Oakbridge Drive, Suite B

Powhatan, Va 23139

Phone: 804.897.1177

Phone: 888.895.1177

Fax 804.897.0070



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NOV 09 2016

12:50pm