



December 14, 2017

airPHX
1100 North Glebe Road, Suite 600
Arlington VA 22201

In and Pre-Treatment Air and Surface Report – [REDACTED] Middle School, Weight and Wrestling Rooms

A. Summary – Air Samples

Pre-treatment air sample results are given below.

Sample Date	Treatment	Number of samples	Location	Average (cfu/m ³)	Range	Standard Deviation	Percent Difference
10/26/17	Pre	18	Weight Room	731	467/967	113.6	-
12/04/17	In			83	33/133	31.9	88.7
10/26/17	Pre	6	Wrestling Room	856	767/1,000	44.4	-
12/04/17	In	0*		-	-	-	-
10/26/17	Pre	4	Hallway	525	433/633	45.8	-
12/04/17	In			75	67/100	4.2	85.7
10/26/17	Pre	4	Exterior	1,391	1,380/1,407	11.2	-
12/04/17	In			1,381	1,356/1,417	23.1	0.7

* Not treated, no samples taken

Background

All air samples were taken via the MB-1 air sampler, 30 liters per sample throughout the various locations given above with results normalized to colony forming units per cubic meter of air (CFU/m³).

*Pre-treatment, given below is a review of the types of airborne organisms found in the inside locations.

Species	Raw Count	Species	Raw Count
<i>Penicillium, aspergillus types</i>	3,650	<i>Stachybotrys chartarum (atra)</i>	2,635
<i>Penicillium purpurogenum</i>	3,500	<i>Cladosporium sphaerospermum</i>	2,225
<i>Aspergillus fumigatus</i>	2,775	<i>Mortierella, spp</i>	1,475
<i>Penicillium brevicompactum</i>	2,640	<i>Basidiospores spp</i>	1,275

* Pre-treatment result are adjusted taking out the exterior samples which were mistakenly included in the original report.

In-treatment, given below is a review of the types of airborne organisms found in the inside locations.

Species	Raw Count	Species	Raw Count
<i>Penicillium, aspergillus types</i>	580	<i>Stachybotrys chartarum (atra)</i>	120
<i>Penicillium purpurogenum</i>	445	<i>Cladosporium sphaerospermum</i>	35
<i>Aspergillus fumigatus</i>	305	<i>Mortierella, spp</i>	< 10
<i>Penicillium brevicompactum</i>	295	<i>Basidiospores spp</i>	< 10

Scientific Air Solutions



10/26/17 Pre-treatment bioburden in all of the above rooms are substantially $> 300 \text{ cfu/m}^3$ which is not acceptable and needs corrective action.

12/04/17 In-treatment bioburden in all of the above rooms show an **85.7% to 88.5% reduction** and are now $< 100 \text{ cfu/m}^3$ and considered **clean and acceptable**.

Observations

Exterior air samples reveal that a significant amount of the bioburden is coming from the outside air. However, the airPHX system is having a significant impact on reducing the internal bioburden.

Target Air Quality

Air quality scale for workplaces, public buildings, schools, and homes are as follows:

- $< 100 \text{ cfu/m}^3$ is considered **clean and acceptable**.
- 100 to 300 cfu/m^3 is **marginal**.
- $> 300 \text{ cfu/m}^3$ is **not acceptable** and needs corrective action.

In most cases, air quality $< 100 \text{ cfu/m}^3$ has shown a decrease in the overall bioburden and odors.

B. Summary - Surface Swabs

In and Pre-treatment surface (swab) sample results are given below.

Sample Date	Treatment	Number of samples	Location	Average (cfu/cm ²)	Range	Standard Deviation	Percent Difference
10/26/17	Pre	6	Various locations	4,167	2,000/7,500	2,109.8	-
12/04/17	In	4*		3	2/5	1.1	99.9
10/26/17	Pre	1	Negative control	0	0/0	-	-
12/04/17	In			0	0/0	-	-

* Two locations not treated, no samples taken

10/26/17 Pre-treatment bioburden in the above locations are $> 10 \text{ cfu/cm}^2$ which is not acceptable and needs corrective action.

12/04/17 In-treatment bioburden in the above locations showed a **99.9% reduction** and are $< 5 \text{ cfu/cm}^2$ is considered **clean and acceptable**.

Target Contact Surface Quality

Contact surface quality scale for workplaces, public buildings, schools, and homes are as follows:

- $< 45 \text{ cfu total}$ or $< 1.67\text{-log}$, or $< 5 \text{ cfu/cm}^2$ is considered **clean and acceptable**.
- 140 to 260 cfu total or 2.15 to 2.41-log, or 5 to 10 cfu/cm^2 is considered **marginal**.
- $> 260 \text{ cfu total}$ or $> 2.41\text{-log}$, or $> 10 \text{ cfu/cm}^2$ is considered **not acceptable** and needs corrective action.

In most cases, air quality $< 45 \text{ cfu total}$ or $< 5 \text{ cfu/cm}^2$ has shown a decrease in the overall bioburden and odors.

Please contact me if there are questions or if further information is needed.

Respectfully submitted,

Rick Falkenberg, Ph.D., CFS
Senior Principal Scientist

Scientific Air Solutions



Table #1
 [REDACTED] School, Weight and Wrestling Rooms
 12/04/17 In-treatment Air and Surface Sample Results - CFU/m³

Middle School - Wrestling and Weight Room - In-treatment 12/04/17											
Plate Lot No.	Air Sample Location	Air Sample Location	Liters of Air	Raw Count	Corrected Count	CFU/m3					
3121	Ctrl	Unopened	0	0	0	0					
3125	Weight Room	1	30	4	4	133					
3129		2	30	2	2	67					
3133		3	30	3	3	100					
3137		4	30	3	3	100					
3141		5	30	2	2	67					
3145		6	30	4	4	133					
3149		7	30	3	3	100					
3153		8	30	4	4	133					
3157		9	30	2	2	67					
3122		10	30	1	1	33					
3126		11	30	2	2	67					
3130		12	30	3	3	100					
3134		13	30	1	1	33					
3138		14	30	1	1	33					
3142		15	30	2	2	67					
3146		16	30	3	3	100					
3150		17	30	3	3	100					
3154		18	30	2	2	67					
-	Wrestling Room	19	30	0	0	0					
-		20	30	0	0	0					
-		21	30	0	0	0					
-		22	30	0	0	0					
-		23	30	0	0	0					
-		24	30	0	0	0					
688	Hallway	H1	30	2	2	67					
689		H2	30	2	2	67					
690		H3	30	2	2	67					
691		H4	30	3	3	100					
2877	Exterior	1	30	115	163	1,417					
427		2	30	110	152	1,382					
428		3	30	104	141	1,356					
429		4	30	106	145	1,368					
Total Adjusted Raw Count							655				
Total CFU/m3							1,800				
Avg							83	High	133		
Low							33	SD	31.9		
Not treated or sampled											
Avg							0	High	0		
Low							0	SD	0.0		
Avg							75	High	100		
Low							67	SD	4.2		
Avg							1,381	High	1,417		
Low							1,356	SD	23.1		

Avg 83 High 133
 Low 33 SD 31.9

Not treated or sampled
 Avg 0 High 0
 Low 0 SD 0.0

Avg 75 High 100
 Low 67 SD 4.2

Avg 1,381 High 1,417
 Low 1,356 SD 23.1

Scientific Air Solutions



Table #2
 [REDACTED] School, Weight and Wrestling Rooms
 12/04/17 In-treatment Air and Surface Sample Results – CFU/cm²

[REDACTED] Middle School - Wrestling and Weight Room - In-treatment 12/04/17					
Room	Swab Number	Surface Swab Sample Location	10x10x10 cm	Raw Count	CFU/cm ²
N/A	CTRL	Control swab	0	0	0
Weight Room	1	2nd Elipitical Bottom Rail	10x10x10	250	3
	2	Floor under chinup rail	10x10x10	310	3
	3	Wooden Floor	10x10x10	150	2
	4	Incline Bench Press	10x10x10	450	5
	C1	Circle on mat - Not sampled			
	C2	Circle on mat - Not sampled			
Avg 3 Max 5					
Min 2 SD 1.1					

Total Adjusted Raw Count 1,160

Total CFU/cm² 12

CONFIDENTIAL



Table #3

School, Weight and Wrestling Rooms
Pictures

In-Treatment – Middle School – Wrestling and Weight Room

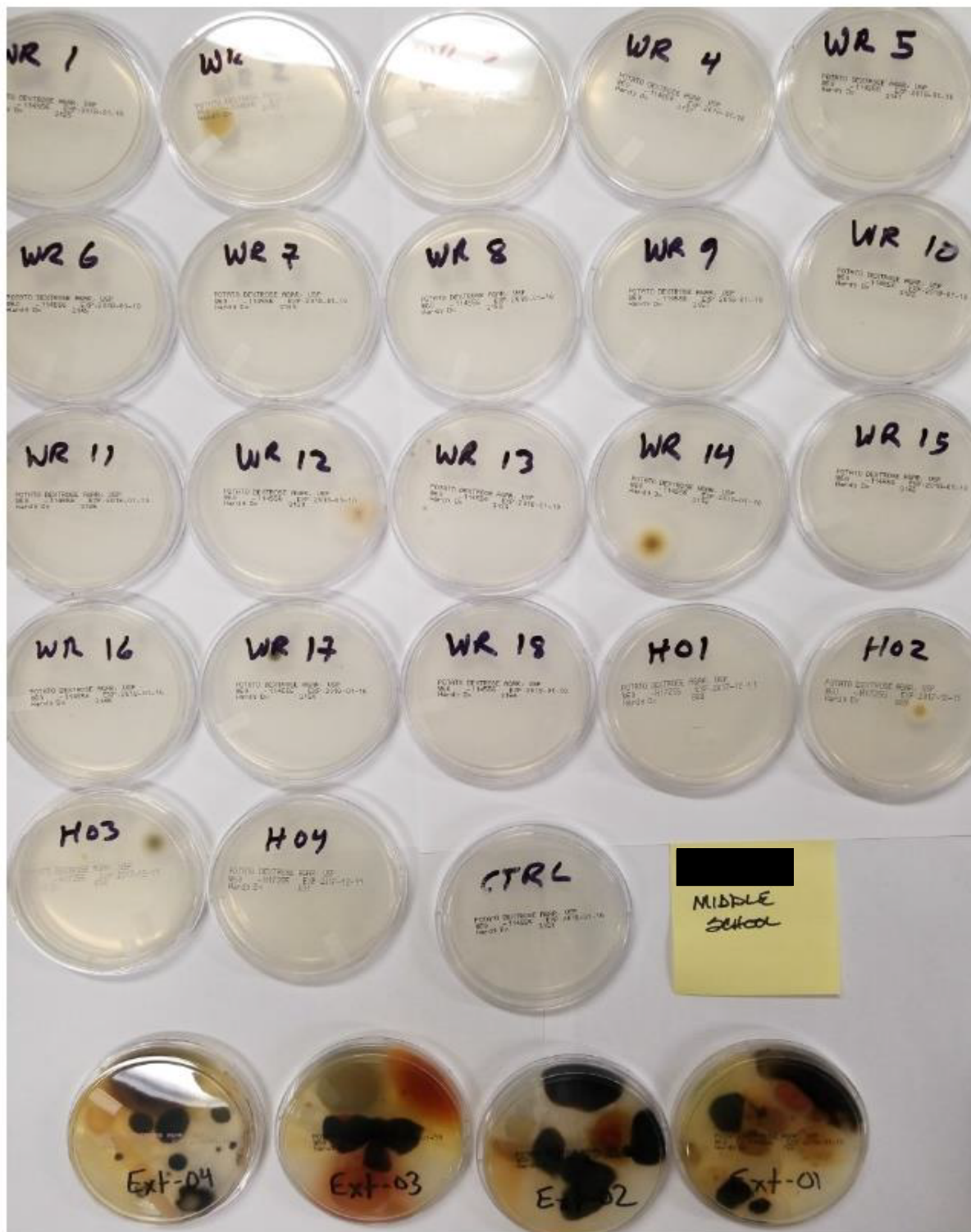
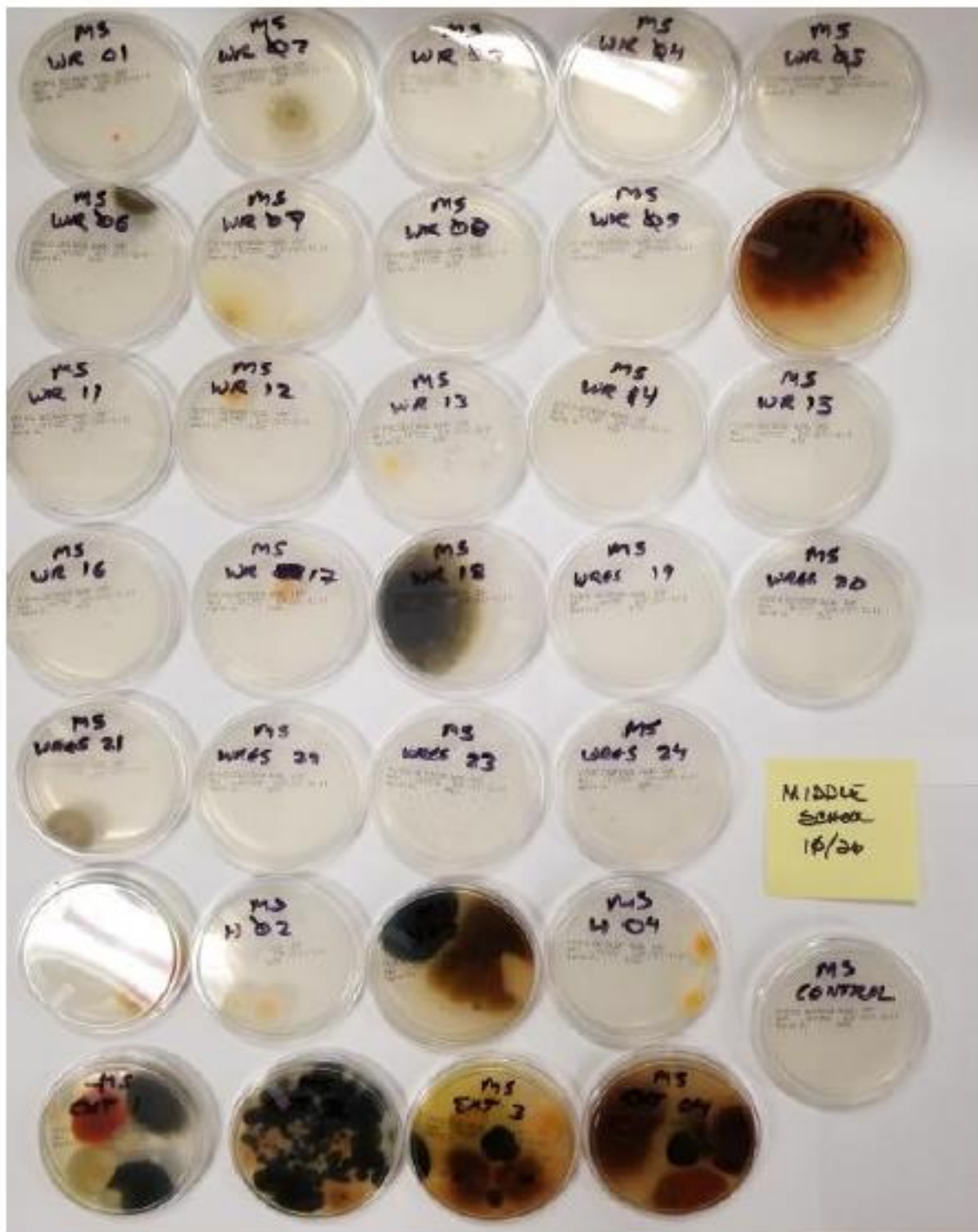




Table #3, continued
School, Weight and Wrestling Rooms
Pictures

Pre-Treatment - Middle School - Wrestling & Weight Room



Scientific Air Solutions



Table #4
 School, Weight and Wrestling Rooms
 Sample Location Map

