

Scientific Air Solutions



airPHX Companies
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July 15, 2020

Pre and In-treatment Air and Surface Report – [REDACTED]

A. Summary – Air Samples

Pre and in-treatment air samples results given below.

Sample Date	Treatment	Number of samples	Location	Average (cfu/m ³)	Range	Standard Deviation	% Reduction
06/18/2020	Pre	14	Various	393	200/600	130.4	-
07/09/2020	In			31	0/100	32.0	92.1
06/18/2020	Pre	4	Exterior	2,458	2,300/2,600	127.7	-
07/09/2020	In			2,108	1,900/2,233	129.9	14.2

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).

Given below are airborne organisms found in the above locations for this **pre-treatment** sampling, excluding the outside samples.

Species	Raw Count	Species	Raw Count
<i>Penicillium, aspergillus types</i>	1,150	<i>Cladosporium sphaerospermum</i>	625
<i>Penicillium brevicompactum</i>	1,035	<i>Ulocladium chartarum</i>	532
<i>Aspergillus fumigatus</i>	906	<i>Absidia spp</i>	329
<i>Penicillium purpurogenum</i>	718	<i>Firmicutes spp</i>	205

Noted below are airborne organisms found in the above locations for this **in-treatment** sampling, excluding the outside samples.

Species	Raw Count	Species	Raw Count
<i>Penicillium, aspergillus types</i>	205	<i>Cladosporium sphaerospermum</i>	< 5
<i>Penicillium brevicompactum</i>	135	<i>Ulocladium chartarum</i>	< 5
<i>Aspergillus fumigatus</i>	93	<i>Absidia spp</i>	< 5
<i>Penicillium purpurogenum</i>	< 5	<i>Firmicutes spp</i>	< 5

06/18/2020 - Pre-treatment bioburden in the above locations are > 300 cfu/m³ which is not acceptable and needs corrective action.

07/09/2020 - In-treatment results show an **92.1% decrease** from the pre-treatment samples and now are < 100 cfu/m³ which is considered **clean and acceptable**.

Observations

The exterior air samples ranged from **1,900 to 2,600 cfu/m³** and reveals that most of the bioburden is attributed to the outside air. The airPHX unit is having a noticeable impact on reducing the 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.

Predominant Microorganisms

Although the predominant organisms noted in this report are fungi, previous testing results show bacteria, viruses and protozoa are eliminated as effectively as fungi. The reactive oxygen species (ROS) generated is effective on gram +, gram – bacteria, protozoa, spores and viruses.

B. Summary – Surface Contact Swabs

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

Sample Date	Treatment	Number of samples	Location	Average (cfu/cm ²)	Range	Standard Deviation	% Reduction
06/18/2020	Pre	9	Various	41.9	25/54	10.4	-
07/09/2020	In			3.2	1.8/4.4	0.9	92.4
06/18/2020	Pre	1	Negative Control	0	0/0	-	-
07/09/2020	In			0	0/0	-	-

06/18/2020 - Pre-treatment contact swab results from the various locations are considerably $> 5 \text{ cfu/cm}^2$ which is considered not acceptable and needs corrective action.

07/09/2020 - In-treatment contact swab results reveal a **92.4% reduction** from the pre-treatment samples from the same locations which are now $< 5 \text{ cfu/cm}^2$ and are considered **clean and acceptable**.

Target Contact Surface Quality

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

- $< 5 \text{ cfu/cm}^2$ is considered **clean and acceptable**.
- 5 to 10 cfu/cm^2 is considered **marginal**.
- $> 10 \text{ cfu/cm}^2$ is considered **not acceptable** and needs corrective action.

In most cases, surface swabs $< 5 \text{ cfu/cm}^2$ 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,

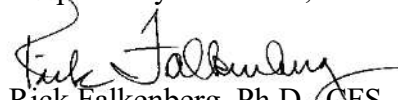

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Senior Principal Scientist



Table #1

07/09/2020 In-treatment Air Sample Results - CFU/m³

07/09/2020 - In-treatment, [REDACTED]						
Plate Lot No.	Air Sample Location	Air Sample Location	Liters of Air	Raw Count	Corrected Count	CFU/m ³
68	Ctrl	Unopened	0	0	0	0
67	1	Hallway	30	3	3	100
66	2	Hallway	30	2	2	67
65	3	Rm 130	30	1	1	33
64	4	Rm 137	30	2	2	67
62	5	Rm 124	30	0	0	0
61	6	Kitchen (washing area)	30	1	1	33
60	7	Dining area	30	0	0	0
59	8	Hallway	30	0	0	0
58	9	Activity (Memory)	30	2	2	67
1993	10	Memory Model C	30	1	1	33
1992	11	Rm 120	30	0	0	0
1991	12	Rm 105	30	1	1	33
1990	13	Rm 102	30	0	0	0
1989	14	Hallway	30	0	0	0
1988	15	Outside	30	55	63	2,100
1987	16	Outside	30	50	57	1,900
1986	17	Outside	30	58	67	2,233
1985	18	Outside	30	57	66	2,200

Avg	31	High	100
Low	0	SD	32.0

Avg	2,108	High	2,233
Low	1,900	SD	129.9

Total Adjusted Raw Count 13
 Total CFU/m³ 433

Table #1, continued

06/18/2020 Pre-treatment Air Sample Results - CFU/m³

06/18/2020 - Pre-treatment, [REDACTED]						
Plate Lot No.	Air Sample Location	Air Sample Location	Liters of Air	Raw Count	Corrected Count	CFU/m ³
68	Ctrl	Unopened	0	0	0	0
67	1	Hallway	30	6	6	200
66	2	Hallway	30	8	8	267
65	3	Rm 130	30	13	13	433
64	4	Rm 137	30	11	11	367
62	5	Rm 124	30	10	10	333
61	6	Kitchen (washing area)	30	11	11	367
60	7	Dining area	30	15	16	533
59	8	Hallway	30	16	17	567
58	9	Activity (Memory)	30	6	6	200
1993	10	Memory Model C	30	16	17	567
1992	11	Rm 120	30	13	13	433
1991	12	Rm 105	30	11	11	367
1990	13	Rm 102	30	17	18	600
1989	14	Hallway	30	15	16	267
1988	15	Outside	30	59	69	2,300
1987	16	Outside	30	61	71	2,367
1986	17	Outside	30	65	77	2,567
1985	18	Outside	30	66	78	2,600

Avg	393	High	600
Low	200	SD	130.4

Avg	2,458	High	2,600
Low	2,300	SD	127.7

Total Adjusted Raw Count 139
 Total CFU/m³ 5,500



Table #2

07/09/2020 In-treatment Surface Sample Results – CFU/cm²

07/09/2020 - In-treatment					
Room	Swab Number	Surface Swab Sample Location	10x10x10 cm	Raw Count	CFU/cm ²
N/A	CTRL	Swab not removed from container	0	0	0
Surface	1	Activity kitchen island	10x10x10	310	3.1
Surface	2	Rm 138 door knob	10x10x10	420	4.2
Surface	3	Hallway rail between 130-128	10x10x10	175	1.8
Surface	4	Kitchen Entrance door	10x10x10	435	4.4
Surface	5	Memory model H window sill	10x10x10	280	2.8
Surface	6	Resident rm 113 light switch	10x10x10	325	3.3
Surface	7	Hallway rail between 116-118	10x10x10	315	3.2
Surface	8	Resident room 104 sink basin	10x10x10	420	4.2
Surface	9	Lobby entrance counter (sign-in)	10x10x10	190	1.9
					Avg 3.2 Max 4.4 Min 1.8 SD 0.90
Total Adjusted Raw Count				2,870	
Total CFU/cm ²				29	

Table #2, continued

06/18/2020 Pre-treatment Surface Sample Results – CFU/cm²

06/18/2020 - Pre-treatment					
Room	Swab Number	Surface Swab Sample Location	10x10x10 cm	Raw Count	CFU/cm ²
N/A	CTRL	Swab not removed from container	0	0	0
Surface	1	Activity kitchen island	10x10x10	4,800	48.0
Surface	2	Rm 138 door knob	10x10x10	5,200	52.0
Surface	3	Hallway rail between 130-128	10x10x10	2,500	25.0
Surface	4	Kitchen Entrance door	10x10x10	5,100	51.0
Surface	5	Memory model H window sill	10x10x10	3,100	31.0
Surface	6	Resident rm 113 light switch	10x10x10	4,500	45.0
Surface	7	Hallway rail between 116-118	10x10x10	4,300	43.0
Surface	8	Resident room 104 sink basin	10x10x10	5,400	54.0
Surface	9	Lobby entrance counter (sign-in)	10x10x10	2,800	28.0
					Avg 41.9 Max 54.0 Min 25.0 SD 10.42
Total Adjusted Raw Count				37,700	
Total CFU/cm ²				377	



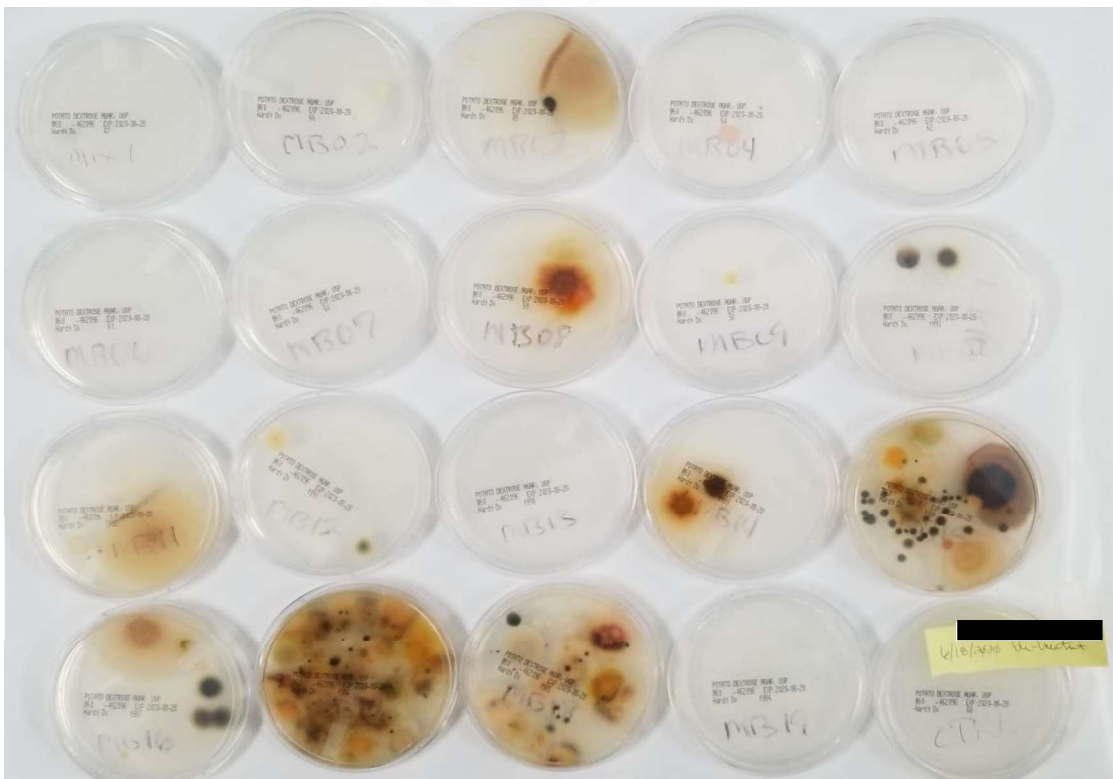
Table #3

07/09/2020- In-treatment Air Sample Pictures



Table #3, continued

06/18/2020 - Pre-treatment Air Sample Pictures

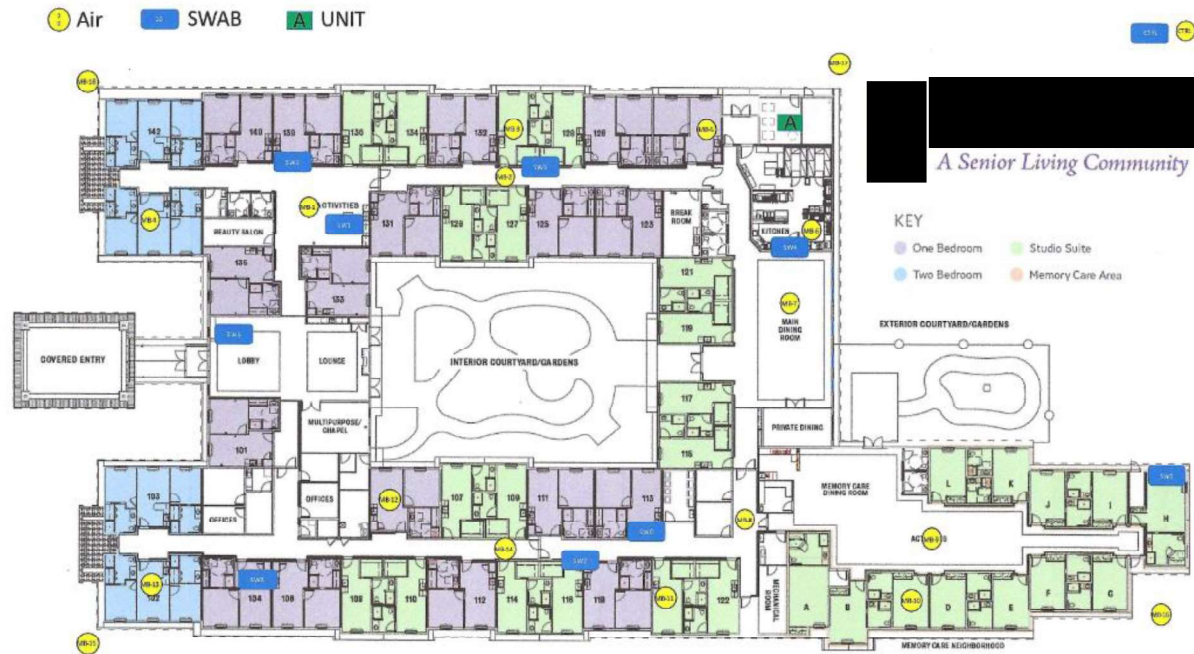


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Table #4

06/18/2020 and 07/09/2020 Pre and In-treatment Air and Surface Swab Locations



06/18/2020 and 07/09/2020 Pre and In-treatment Air and Surface Swab Locations, continued

Facility: [REDACTED]
Date: June 18, 2020

Air and Surface Samples				
Lot #	Plate #	Room	Test Location	Notes
	68		CTRL	
	67		MB01	Hallway
	66		MB02	Hallway
	65		MB03	Room 130
	64		MB04	Room 137
	62		MB05	Room 124
	61		MB06	Kitchen (washing area)
	60		MB07	Dining Area
	59		MB08	Hallway
	58		MB09	Activity (Memory)
	1993		MB10	Memory Model C
	1992		MB11	Room 120
	1991		MB12	Room 105
	1990		MB13	Room 102
	1989		MB14	Hallway
	1988		MB15	Outside
	1987		MB16	Outside
	1986		MB17	Outside
	1985		MB18	Outside
	1984		MB19	SPARE (disregard)
			SW1	Activity Kitchen Island
			SW2	Room 138 Door Knob
			SW3	Hallway Rail Between 130-128
			SW4	Kitchen Entrance Door
			SW5	Memory Model H Window Sill
			SW6	Resident Room 113 Light Switch
			SW7	Hallway Rail Between 116-118
			SW8	Resident Room 104 Sink Basin
			SW9	Lobby Entrance Counter (Sign-in)
			CTRL	