Scientific Air Solutions

airPHX Companies
1311-A Dolley Madison Blvd.
McLean, VA 22101

September 5, 2020

Pre and In-treatment Air & Surface Report, Second Location – [redacted], Inc., [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	Percent Reduction
08/17/2020	Pre	22	Various	1,827	1,467/2,167	186.3	-
08/24/2020	In			247	100/400	72.4	86.5
08/31/2020	In			**176**	**100/267**	**45.2**	**90.4**
08/17/2020	Pre	4	Exterior	1,933	1,600/2,300	304.6	-
08/24/2020	In			1,925	1,600/2,233	225.3	0.4
08/31/2020	In			**1,725**	**1,200/2,167**	**404.4**	**10.8**

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/m^3).

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
Penicillium, aspergillus types	9,100	*Ulocladium chartarum*	4,545
Aspergillus fumigatus	7,120	*Cladosporium sphaerospermum*	3,125
Penicillium brevicompactum	6,140	*Firmicutes spp*	2,850
Penicillium purpurogenum	5,610	*Absidia spp*	1,710

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

Species	Raw Count	Species	Raw Count
Penicillium, aspergillus types	1,205	*Ulocladium chartarum*	660
Aspergillus fumigatus	1,075	*Cladosporium sphaerospermum*	525
Penicillium brevicompactum	935	*Firmicutes spp*	428
Penicillium purpurogenum	820	*Absidia spp*	385

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

Species	Raw Count	Species	Raw Count
Penicillium, aspergillus types	985	*Ulocladium chartarum*	430
Aspergillus fumigatus	725	*Cladosporium sphaerospermum*	155
Penicillium brevicompactum	610	*Firmicutes spp*	145
Penicillium purpurogenum	570	*Absidia spp*	47

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08/17/2020 - Pre-treatment bioburden in the above locations are considerably > 300 cfu/m^3 which is not acceptable and needs corrective action.

08/24/2020 - In-treatment #1 results show a **86.5% decrease** from the pre-treatment samples, these results are now 100 to 300 cfu/m^3 which is marginal.

- For a 6-day treatment period*, these are recognizable results and further reduction can be expected with continued treatment. * Corrected from the previous report.

08/31/2020 - In-treatment #2 results yield a **90.4% decrease** from the pre-treatment samples; these results are lower, however, still at 100 to 300 cfu/m^3 which is **marginal**.

- For an additional 6-day treatment period, 12-days total, these are clear-cut results and further reduction can be anticipated with continued treatment

Observations

The exterior air samples ranged from **1,200** to **2,300 cfu/m^3** and discloses that most of the bioburden is attributed to the outside air. The airPHX unit continues to have a distinct impact on reducing the bioburden.

Target Air Quality

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

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

In most cases, air quality **< 100 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 oxidative molecules generated are 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
08/17/2020	Pre	11	Various	60.1	32/89	18.3	-
08/24/2020	In			6.3	2.7/8.9	2.1	89.5
08/31/2020	In			**3.1**	**1.4/4.4**	**1.0**	**94.8**
08/17/2020	Pre	1	Negative Control	0	0/0	-	-
08/24/2020	In			0	0/0	-	-
08/31/2020	In			0	0/0	-	-

08/17/2020 - Pre-treatment contact swab results from the various locations are noticeably > 10 cfu/cm^2 which is considered not acceptable and needs corrective action.

08/24/2020 - In-treatment contact swab results exhibit a **89.5% reduction** from the pre-treatment samples from the same locations which are now 5 to 10 cfu/cm^2 which is considered marginal.

- These are notable results for a 6-day exposure* with very high initial bioburden, further reduction can be expected with continued treatment. * Corrected from the previous report.

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08/31/2020 - In-treatment contact swab results display a **94.8% reduction** from the pre-treatment samples, from the same locations, which are now < 5 cfu/cm^2 is considered **clean and acceptable**.

- These are inspiring results from an additional 6-day exposure for 12-day total treatment time with very high initial bioburden areas, further reduction can be predicted with continued treatment.

Target Contact Surface Quality

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

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

In most cases, surface swabs **< 5 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

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Table #1

[redacted], Inc., [redacted]

08/31/2020 In-treatment Air Sample Results - CFU/m^3

08/31/2020 - In-treatment #2, [redacted] - Second Location										
Plate Lot No.	Air Sample Location	Air Sample Location	Liters of Air	Raw Count	Corrected Count	CFU/m3				
2390	Ctrl 1	Unopened	0	0	0	0				
2395	Ctrl 2	Unopened	0	0	0	0				
2548	1	VAG1 - 1	30	6	6	200				
2556	2	VAG1 - 2	30	7	7	233				
2325	3	VAG1 - 3	30	5	5	167				
2500	4	VAG2 - 1	30	5	5	167				
2492	5	VAG2 - 2	30	6	6	200				
2379	6	VAG3 - 1	30	8	8	267				
2535	7	VAG3 - 2	30	5	5	167				
2484	8	VAG3 - 3	30	3	3	100				
2371	9	VAG4- 1	30	8	8	267				
2559	10	VAG4- 2	30	4	4	133				
2487	11	VAG5 - 1	30	3	3	100				
2527	12	VAG5 - 2	30	6	6	200				
2551	13	VAG5 - 3	30	6	6	200				
2519	14	VAG6 - 1	30	4	4	133				
2543	15	VAG6 - 2	30	6	6	200				
2503	16	VAG7 - 1	30	4	4	133				
2511	17	VAG7 - 2	30	5	5	167				
2363	18	VAG8 - 1	30	6	6	200				
2347	19	VAG8 - 2	30	4	4	133				
2323	20	VAG8 - 3	30	5	5	167				
2387	21	VAG9 - 1	30	6	6	200	Avg	176	High	267
2495	22	VAG9 - 2	30	4	4	133	Low	100	SD	45.2
2355	1	Outside	30	33	36	1,200				
2398	2	Outside	30	40	44	1,467				
2339	3	Outside	30	54	62	2,067	Avg	1,725	High	2,167
2331	4	Outside	30	56	65	2,167	Low	1,200	SD	404.4

Total Adjusted Raw Count	116
Total CFU/m3	3,867

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Table #1, continued

[redacted], Inc., [redacted]

08/24/2020 In-treatment Air Sample Results - CFU/m^3

08/24/2020 - In-treatment, [redacted] Second Location											
Plate Lot No.	Air Sample Location	Air Sample Location	Liters of Air	Raw Count	Corrected Count	CFU/m3					
2508	Ctrl 1	Unopened	0	0	0	0					
2516	Ctrl 2	Unopened	0	0	0	0					
2254	1	VAG1 - 1	30	8	8	267					
2246	2	VAG1 - 2	30	6	6	200					
2557	3	VAG1 - 3	30	7	7	233					
2263	4	VAG2 - 1	30	12	12	400					
2515	5	VAG2 - 2	30	9	9	300					
2539	6	VAG3 - 1	30	10	10	333					
2547	7	VAG3 - 2	30	9	9	300					
2555	8	VAG3 - 3	30	12	12	400					
2523	9	VAG4- 1	30	8	8	267					
2531	10	VAG4- 2	30	11	11	367					
2491	11	VAG5 - 1	30	6	6	200					
2499	12	VAG5 - 2	30	8	8	267					
2507	13	VAG5 - 3	30	3	3	100					
2389	14	VAG6 - 1	30	10	10	333					
2397	15	VAG6 - 2	30	7	7	233					
2483	16	VAG7 - 1	30	5	5	167					
2365	17	VAG7 - 2	30	6	6	200					
2373	18	VAG8 - 1	30	9	9	300					
2381	19	VAG8 - 2	30	8	8	267					
2333	20	VAG8 - 3	30	10	10	333					
2341	21	VAG9 - 1	30	9	9	300	Avg	274	High	400	
2357	22	VAG9 - 2	30	8	8	267	Low	100	SD	72.4	
2340	1	Outside	30	50	57	1,900					
2524	2	Outside	30	43	48	1,600					
2532	3	Outside	30	52	59	1,967	Avg	1,925	High	2,233	
2540	4	Outside	30	58	67	2,233	Low	1,600	SD	225.3	

Total Adjusted Raw Count 181

Total CFU/m3 6,033

Table #1, continued

[redacted], Inc., [redacted]

08/17/2020 Pre-treatment Air Sample Results - CFU/m^3

08/17/2020 - Pre-treatment, [redacted] - Second Location											
Plate Lot No.	Air Sample Location	Air Sample Location	Liters of Air	Raw Count	Corrected Count	CFU/m3					
2533	Ctrl 1	Unopened	0	0	0	0					
2540	Ctrl 2	Unopened	0	0	0	0					
2484	1	VAG1 - 1	30	55	63	2,100					
2565	2	VAG1 - 2	30	53	61	2,033					
2270	3	VAG1 - 3	30	48	54	1,800					
2278	4	VAG2 - 1	30	48	54	1,800					
2286	5	VAG2 - 2	30	50	57	1,900					
2294	6	VAG3 - 1	30	46	52	1,733					
2302	7	VAG3 - 2	30	45	50	1,667					
2310	8	VAG3 - 3	30	48	54	1,800					
2318	9	VAG4- 1	30	40	44	1,467					
2081	10	VAG4- 2	30	42	47	1,567					
2089	11	VAG5 - 1	30	45	50	1,667					
2097	12	VAG5 - 2	30	52	59	1,967					
2105	13	VAG5 - 3	30	50	57	1,900					
2113	14	VAG6 - 1	30	48	54	1,800					
2121	15	VAG6 - 2	30	45	50	1,800					
2129	16	VAG7 - 1	30	43	48	1,600					
2137	17	VAG7 - 2	30	56	65	2,167					
2145	18	VAG8 - 1	30	42	47	1,567					
2153	19	VAG8 - 2	30	48	54	1,800					
2493	20	VAG8 - 3	30	40	44	1,967					
2485	21	VAG9 - 1	30	54	62	2,067	Avg	1,827	High	2,167	
2509	22	VAG9 - 2	30	55	61	2,033	Low	1,467	SD	186.3	
2501	1	Outside	30	45	50	1,667					
2525	2	Outside	30	43	48	1,600					
2517	3	Outside	30	56	65	2,167	Avg	1,933	High	2,300	
2541	4	Outside	30	59	69	2,300	Low	1,600	SD	304.6	

Total Adjusted Raw Count 1,187

Total CFU/m3 40,200

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Table #2

[redacted], Inc., [redacted]

08/31/2020 In-treatment Surface Sample Results – CFU/cm^2

08/31/2020 - In-treatment #2, [redacted] - Second Location										
Room	Swab Number	Surface Swab Sample Location	10x10x10 cm	Raw Count	CFU/cm2					
N/A	CTRL	Swab not removed from container	0	0	0					
Surface	SS-1	Iso-slicer machine table	10x10x10	361	3.6					
Surface	SS-2A	Band saw cutting table - beef	10x10x10	350	3.5					
Surface	SS-2B	Band saw cutting table - pork (not in use)	10x10x10	200	2.0					
Surface	SS-3	Conveyor table	10x10x10	190	1.9					
Surface	SS-4	Tumbler processing ring	10x10x10	135	1.4					
Surface	SS-5	Pre-cutting table 1-R	10x10x10	340	3.4					
Surface	SS-6	Pre-cutting table 1-L	10x10x10	345	3.5					
Surface	SS-7	Multivac Packaging table (not in use)	10x10x10	440	4.4					
Surface	SS-7B	Multivac Packaging table (not in use)	10x10x10	225	2.3					
Surface	SS-8	Wall opposite air flow	10x10x10	395	4.0	Avg	3.1	Max	4.4	
Surface	SS-9	Meat court	10x10x10	390	3.9	Min	1.4	SD	0.96	

Table #2, continued

[redacted], Inc., [redacted]

08/24/2020 In-treatment Surface Sample Results – CFU/cm^2

08/24/2020 - In-treatment, [redacted] - Second Location										
Room	Swab Number	Surface Swab Sample Location	10x10x10 cm	Raw Count	CFU/cm2					
N/A	CTRL	Swab not removed from container	0	0	0					
Surface	SS-1	Iso-slicer machine table	10x10x10	772	7.7					
Surface	SS-2A	Band saw cutting table - beef	10x10x10	695	7.0					
Surface	SS-2B	Band saw cutting table - pork (not in use)	10x10x10	408	4.1					
Surface	SS-3	Conveyor table	10x10x10	380	3.8					
Surface	SS-4	Tumbler processing ring	10x10x10	267	2.7					
Surface	SS-5	Pre-cutting table 1-R	10x10x10	687	6.9					
Surface	SS-6	Pre-cutting table 1-L	10x10x10	688	6.9					
Surface	SS-7	Multivac Packaging table (not in use)	10x10x10	885	8.9					
Surface	SS-7B	Multivac Packaging table (not in use)	10x10x10	456	4.6					
Surface	SS-8	Wall opposite air flow	10x10x10	800	8.0	Avg	6.3	Max	8.9	
Surface	SS-9	Meat court	10x10x10	890	8.9	Min	2.7	SD	2.06	

Table #2, continued

[redacted], Inc., [redacted]

08/17/2020 Pre-treatment Surface Sample Results – CFU/cm^2

08/17/2020 - Pre-treatment, [redacted] - Second Location										
Room	Swab Number	Surface Swab Sample Location	10x10x10 cm	Raw Count	CFU/cm2					
N/A	CTRL	Swab not removed from container	0	0	0					
Surface	SS-1	Iso-slicer machine table	10x10x10	8,500	85.0					
Surface	SS-2A	Band saw cutting table - beef	10x10x10	7,650	76.5					
Surface	SS-2B	Band saw cutting table - pork (not in use)	10x10x10	4,900	49.0					
Surface	SS-3	Conveyor table	10x10x10	3,800	38.0					
Surface	SS-4	Tumbler processing ring	10x10x10	3,200	32.0					
Surface	SS-5	Pre-cutting table 1-R	10x10x10	5,500	55.0					
Surface	SS-6	Pre-cutting table 1-L	10x10x10	6,200	62.0					
Surface	SS-7	Multivac Packaging table (not in use)	10x10x10	6,200	62.0					
Surface	SS-7B	Multivac Packaging table (not in use)	10x10x10	4,100	41.0					
Surface	SS-8	Wall opposite air flow	10x10x10	7,200	72.0	Avg	60.1	Max	89.0	
Surface	SS-9	Meat court	10x10x10	8,900	89.0	Min	32.0	SD	18.25	

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Table #3
[redacted], Inc., [redacted]
08/31/2020 In-treatment #2, Air Sample Pictures

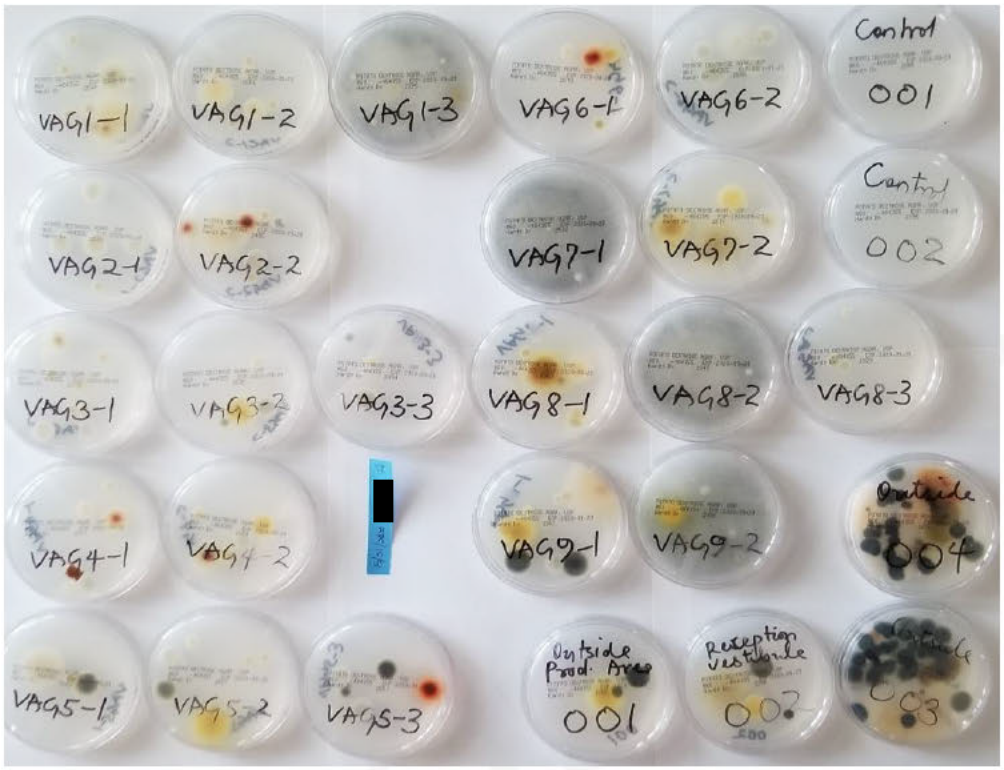

Table #3, continued
[redacted], Inc., [redacted]
08/24/2020 In-treatment #1, Air Sample Pictures

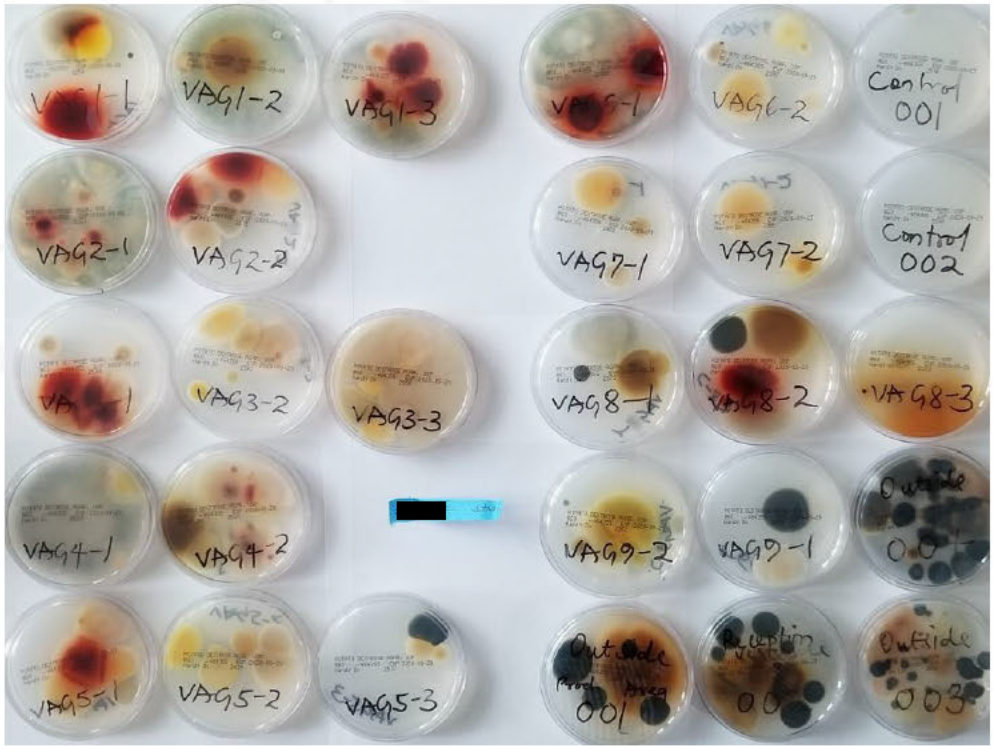

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Table #3, continued
[redacted], Inc., [redacted]
08/17/2020 Pre-treatment, Air Sample Pictures

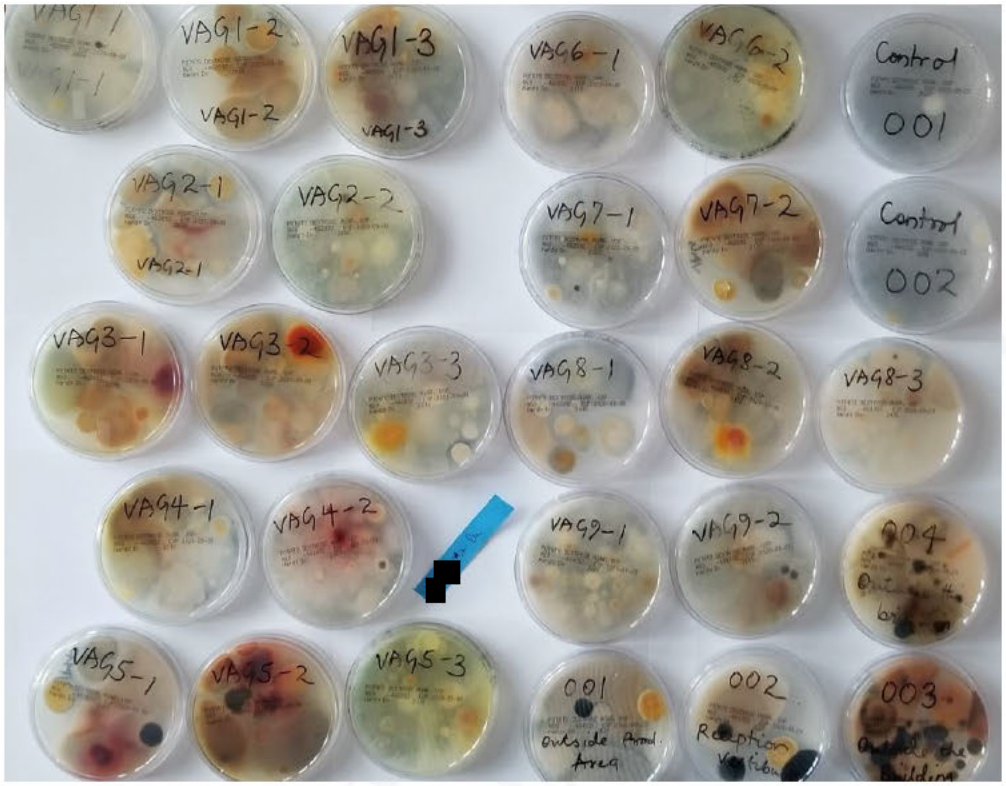

Table #4
[redacted], Inc., [redacted]
08/17/2020, 08/24/2020 and 08/31/2020 Pre, In-treatment #1 and #2, Air and Surface Swab Locations

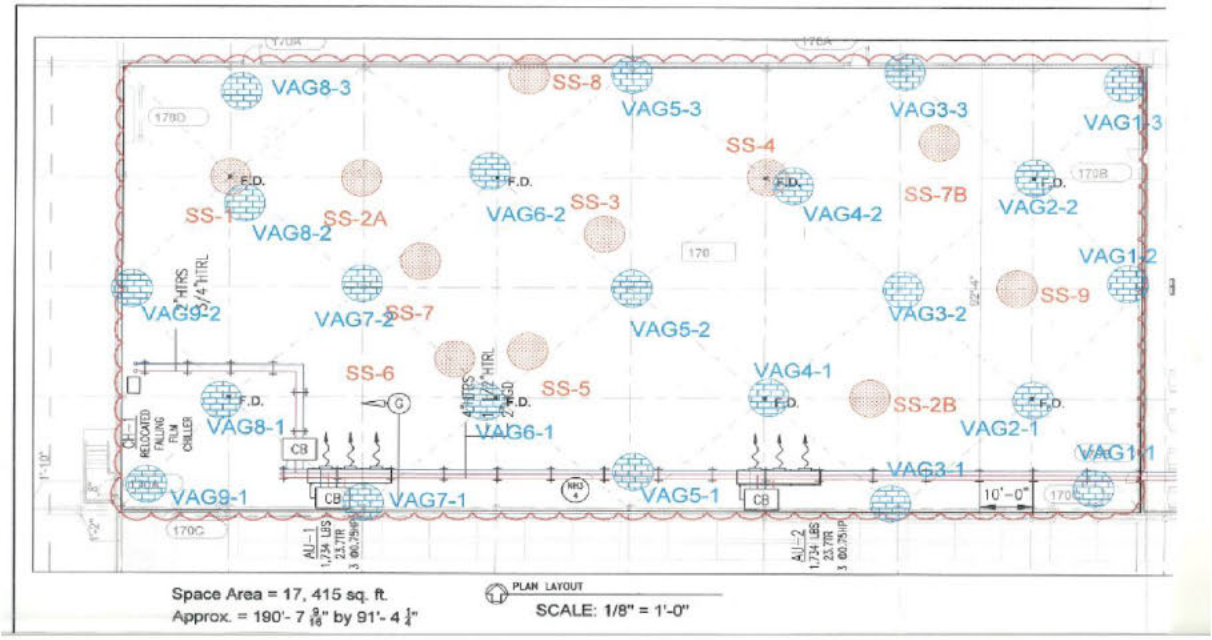

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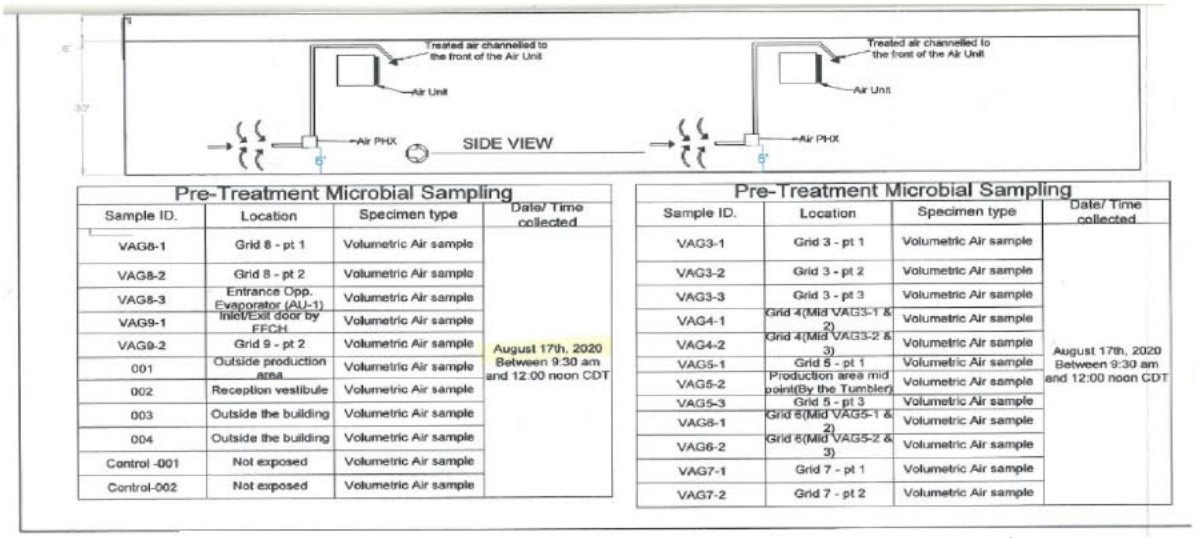
Table #4, continued

[redacted], Inc., [redacted]

08/17/2020, 08/24/2020 and 08/31/2020 Pre, In-treatment #1 and #2, Air and Surface Swab Locations



Pre-Treatment Microbial Sampling

Sample ID.	Location	Specimen type	Date/ Time collected
VAG8-1	Grid 8 - pt 1	Volumetric Air sample	August 17th, 2020 Between 9:30 am and 12:00 noon CDT
VAG8-2	Grid 8 - pt 2	Volumetric Air sample	
VAG8-3	Entrance Opp. Evaporator (AU-1)	Volumetric Air sample	
VAG9-1	Inlet/Exit door by FFCH	Volumetric Air sample	
VAG9-2	Grid 9 - pt 2	Volumetric Air sample	
001	Outside production area	Volumetric Air sample	
002	Reception vestibule	Volumetric Air sample	
003	Outside the building	Volumetric Air sample	
004	Outside the building	Volumetric Air sample	
Control -001	Not exposed	Volumetric Air sample	
Control-002	Not exposed	Volumetric Air sample	

Pre-Treatment Microbial Sampling

Sample ID.	Location	Specimen type	Date/ Time collected
VAG3-1	Grid 3 - pt 1	Volumetric Air sample	August 17th, 2020 Between 9:30 am and 12:00 noon CDT
VAG3-2	Grid 3 - pt 2	Volumetric Air sample	
VAG3-3	Grid 3 - pt 3	Volumetric Air sample	
VAG4-1	Grid 4(Mid VAG3-1 & 2)	Volumetric Air sample	
VAG4-2	Grid 4(Mid VAG3-2 & 3)	Volumetric Air sample	
VAG5-1	Grid 5 - pt 1	Volumetric Air sample	
VAG5-2	Production area mid point(By the Tumbler)	Volumetric Air sample	
VAG5-3	Grid 5 - pt 3	Volumetric Air sample	
VAG8-1	Grid 6(Mid VAG5-1 & 2)	Volumetric Air sample	
VAG6-2	Grid 6(Mid VAG5-2 & 3)	Volumetric Air sample	
VAG7-1	Grid 7 - pt 1	Volumetric Air sample	
VAG7-2	Grid 7 - pt 2	Volumetric Air sample	

Pre-Treatment Microbial Sampling

Sample ID.	Location	Specimen type	Date/ Time collected
SS-1	Iso-slicer machine table	Surface Swab	August 17th, 2020 Between 9:30 am and 12:00 noon CDT
SS-2A	Band saw Cutting table - Beef	Surface Swab	
SS-2B	Band saw Cutting table - Pork(not in use)	Surface Swab	
SS-3	Conveyor Table	Surface Swab	
SS-4	Tumbler processing ring	Surface Swab	
SS-5	Pre-cutting table I-R	Surface Swab	
SS-6	Pre-cutting table 1-L	Surface Swab	
SS-7	Multivac Packaging table(not in use)	Surface Swab	
SS-7B	Multivac Packaging table(in use)	Surface Swab	
SS-8	Wall opposite Air flow	Surface Swab	
SS-9	Meat Court	Surface Swab	
VAG1-1	Main Entrance	Volumetric Air sample	
VAG1-2	Mid point Grid 1	Volumetric Air sample	
VAG1-3	Side Entrance	Volumetric Air sample	
VAG2-1	Grid 2(Mid VAG1-1 & 2)	Volumetric Air sample	
VAG2-2	Grid 2(Mid VAG1-2 & 3)	Volumetric Air sample	

DualTemp clauger — PRE-TREATMENT SAMPLING POINTS (PHASE 1) — PROFESSIONAL FREEZING SERVICES — R-4A — REFRIGERATION

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