



Exponent
475 14th Street, Suite 400
Oakland, CA 94612

telephone 510-268-5000
facsimile 510-268-5099
www.exponent.com

March 8, 2018

Lynn M. Beekman, Esq.
Fagen Friedman & Fulfroost LLP
1525 Faraday Avenue, Suite 300
San Diego, California 92008

VIA ELECTRONIC MAIL: lbeekman@f3law.com

Subject: Focused Indoor Environmental Quality Inspections at Charles Helmers
and Bridgeport Elementary Schools
Saugus Unified School District, Valencia, California
Exponent Project No. 1703766.000

Dear Ms. Beekman:

Exponent conducted a focused indoor environmental quality investigation at Charles Helmers and Bridgeport Elementary Schools in Valencia, California, on February 3, 2018. The objective of this investigation was to evaluate the current indoor environmental conditions within the schools in response to complaints of odor and/or moisture and indoor air quality complaints based on information provided to Exponent by representatives of the school district. The inspections were attended by Mr. Michael Posson (Exponent), the assistant superintendent of business, the superintendent, and a school teacher (Charles Helmers location only), as outlined in this letter report.

This evaluation included the following tasks:

- Focused building inspections for areas identified by school district representatives as having historical water/moisture intrusion and odor complaints at Bridgeport Elementary School
- Focused building inspections for areas identified by school district representative as having odor complaints and possible fungal growth at Charles Helmers Elementary School
- Focused visual inspection of some air handling units (AHUs) at Charles Helmers and Bridgeport Elementary Schools
- Measurement of outdoor air supplied to selected classrooms at Charles Helmers

This report presents the study methods, observations, conclusions, and limitations associated with our inspections.

Executive Summary

We did not identify any hazardous indoor air quality conditions within the areas of the schools inspected on February 3, 2018. All VOC and suspended particulate measurements were at low or normal concentrations with no unusual findings. No visible evidence of unusual fungal growth was observed on the accessible surfaces inspected at both Charles Helmers and Bridgeport Elementary Schools. In the areas where staining was observed or suspected, the surface testing results did not indicate abnormal conditions.

Study Methods

School Tours with School District and School Representatives

Representatives of the school district were present during the school tours, as noted below:

- Charles Helmers Elementary: superintendent, assistant superintendent of business, school teacher currently in portable classroom 37.
- Bridgeport Elementary: assistant superintendent of business

The information from discussions with these representatives is summarized in the results section below:

Focused Building Inspection

A tour of the select areas of each school was conducted, which included the interior occupiable spaces and exterior of the school areas under study. The focused building surveys included one or more of the following activities for each specific area of the school inspected, as noted in Table 1:

- Visual inspection and odor sensations
- Measurement of outdoor air supply
- Collection of air samples for analysis of fungal spore concentrations
- Collection of bulk and tape lift samples

- Moisture meter measurements in either construction materials or concrete slab
- Volatile Organic Compound (VOC) screening with a handheld photo-ionization detector (PID)
- Total suspended particulate matter (TSP) with a handheld TSI DustTrak.
- Collection of thermal comfort parameters, including relative humidity and temperature

During our inspections, information was recorded concerning general observations and any remarkable conditions as well as noticeable odors and visible observations of moisture or water intrusion. Photographs were taken to document the observations. At Bridgeport Elementary, we lifted several carpet tiles to observe the condition of the concrete slab and carpet backing in the classrooms that were inspected. Visible signs of moisture were subjectively graded (on a scale from 0 to 3, as noted in the attached tables) based on the visible presence of moisture on the exposed surfaces of the slab and/or carpet backing when it was lifted. Odor sensations were noted upon entering each room and also when lifting a carpet tile, if applicable. Concrete moisture meter measurements were taken in some locations using a handheld Tramex moisture meter, as noted in Table 1. Moisture meter measurements were taken using a handheld GE Protimeter Hygromaster. The moisture meter was calibrated according to the manufacturer's instructions before and after use and was found to be within normal operating conditions.

Total Volatile Organic Compounds (VOCs)

As noted in Table 1, VOC screening measurements were obtained at each sampling location during our inspections using a calibrated Rae Systems 3500 photo-ionization detector (PID). This device is capable of detecting general VOCs at part per billion (ppb) levels. The PID instrument is a non-specific method of measuring a combination of gases and vapors simultaneously. It is commonly used to measure the presence of volatile organic compounds, such as solvents, petroleum fuels (e.g., gasoline and diesel vapors), and common chemicals off-gassing from new furnishings and building materials. The instrument does not indicate the identity of the chemical it is detecting. Thus, it is only a general indicator of indoor air quality related to the presence of these types of chemicals and the likely source of VOCs. VOC measurements made with the PID were compared to a screening value range of 200 to 300 ppb (parts per billion in air). This value is not a health-based value and was approximated¹ based on the screening value published by the U.S. Green Building Council for establishing Leadership in

¹ Air concentration units for the TVOC screening level (500 micrograms per cubic meter [$\mu\text{g}/\text{m}^3$]) from the U.S. Green Building Council was converted using the molecular weight range of 40 to 60 grams per mole based on the molecular weight range of typical indoor air contaminants commonly found in normal buildings (e.g., ethanol, acetone, isopropanol).

Energy and Environmental Design (LEED) Certifications² since there are no established health-based screening levels for total volatile organic compounds (TVOCs).

Temperature and Relative Humidity Measurements

A calibrated, handheld velometer (TSI VelociCalc, Model 9565) was used to measure temperature and humidity levels at each sampling location, as applicable. The instrument was placed in the area under study and allowed to equilibrate. Triplicate measurements were recorded during the inspection at each location. The average of the three measurements is reported.

Suspended Particulates

A calibrated, handheld TSI Incorporated DustTrak DRX (Model 8534) was used to measure suspended particulates. The instrument was used to make total suspended particulate (TSP), particulate matter with an aerodynamic diameter less than 10 microns (PM10), and PM 2.5 concentration measurements at the indoor and outdoor sample locations. The measurement of PM10 and PM2.5 has physiological importance. PM10 can penetrate into the lung if inhaled down to the bronchiole region of the lung. PM2.5 particles are smaller than PM10 particles and can penetrate into the alveolar region where gas exchange occurs. Concentrations were collected over a three-minute interval and were collected during the collection of the airborne fungal spore samples. The average concentration was recorded.

Air Flow Measurements and Focused Visual Inspection of Select Air Handling Unit (AHU) Components at Emblem and Bridgeport Elementary Schools

An assessment was made of the amount of outdoor air supplied by the AHUs to portable classrooms located at Charles Helmers Elementary School and two classrooms at Bridgeport Elementary School. Air velocity measurements were taken from the outdoor air intakes of the AHUs that supply outdoor air to the room(s) serviced. An experienced HVAC mechanic who maintains the systems at the school identified and provided an overview of the system operation for the rooms of interest. A calibrated, handheld velometer (TSI VelociCalc, Model 9565) was used to measure air velocities. Measurements were taken at times of calm winds to reduce the influence of outdoor wind conditions. Six to ten measurements were collected and recorded along the horizontal and vertical dimensions of the outdoor air intakes of each AHU evaluated. The size of each opening was measured with a tape measure. The air flow measurements were used to calculate the average air velocity over the face of the outdoor air intake vent. The average air velocity values, in concert with the intake dimensions, were used to calculate volumetric flow rates (in cubic feet per minute [CFM]). To determine the volumetric flow per

² U.S. Green Building Council. 2017. Table 1. Maximum Concentrations Levels. Available online: <http://www.usgbc.org/resources/table-1-maximum-concentration-levels-contaminant-and-testing>. Accessed May 12, 2017.

person, air flow rates were divided by the room occupancy. The room occupancy values were provided by the school district. The resulting CFM/occupant values were then compared to the California Code of Regulation (CFR), Title 24 requirements of 15 CFM/occupant for nonresidential buildings. Further, the American National Standards Institute/American Society of Heating, Refrigerating, and Air Conditioning Engineers (ANSI/ASHRAE) Standard 62.1 (*Ventilation for Acceptable Indoor Air Quality*) values of 13 to 15 CFM/occupant recommended for school classrooms were also used as a point of comparison.

In addition to the air velocity measurements, several other observations were made regarding each AHU inspected, including:

- The orientation of the intake louver controlled by the economizer
- Visual inspection of the condition of the air filters
- The general condition of the heat exchange coils and condensation trays. In general, we were looking for readily apparent signs of corrosion, soiling, rusting, unusual moisture, or fungal growth in these areas.

Airborne Fungal Spore Concentrations

Air samples were collected at selected indoor and outdoor locations to determine the types and concentrations of airborne fungal spores present. Two samples were collected at each outdoor location. Two indoor sample locations were identified for each classroom. The air samples were collected using Zefon Air-O-Cell[®] spore-trap devices. This device consists of a microscope cover slip coated with a transparent adhesive material encased in a 37-millimeter-diameter polystyrene cassette fitted with an inlet nozzle. Air was passed through each sampling cassette by an electrically-driven, high-volume air-sampling pump calibrated at a flow rate of 15 liters per minute by use of a precision rotameter that had been calibrated against a primary standard. The sampling cassettes were placed approximately four to five feet above the floor surface on a tripod stand (i.e., breathing zone height). Each sample was collected for five consecutive minutes. A field blank sample was collected for quality control purposes during the evaluation. A field blank identifies contamination as a result of collection and transport of the samples and is collected by handling the Air-O-Cell[®] spore trap cassette media in the same manner as the samples except that the field blanks were not used to sample the air. A representative photograph depicting the sampling setup is shown in Photo 1.

Surface and Bulk Sampling

Surface samples in selected areas were collected in order to determine whether areas of suspected fungal growth based on a visual inspection are actual fungal growth. Tape-lift

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samples were collected using 0.75-inch wide, clear, transparent adhesive tape. A two- to-three-inch piece of tape was removed from the tape dispenser. The adhesive side of the tape was applied to the surface being sampled, ensuring contact. The index finger was used to apply light pressure on the tape to assure adherence of the material being sampled on the target surface to the tape. The section of tape was then removed, placed into a dedicated polyethylene bag, labeled, and submitted to the laboratory for analysis.

One bulk sample of a suspected fungal growth under artificial turf at Charles Helmers Elementary School was obtained. The sample was placed into a sealable polyethylene bag. The sample was taken from a bucket of material that was located at the school district office. The material in the bucket was contained in a plastic bag. The material was reportedly removed by school district staff from beneath a section of artificial turf located to the south of portable classroom 37.

Sample Handling

Upon completion of sample collection, the cassettes and tape lift samples were sealed, uniquely labeled, and shipped under standard chain-of-custody procedures to Aemtek, Inc. (Aemtek) laboratory in Fremont, California. In the laboratory, fungal spores were identified and counted or qualitatively reported for tape lift samples.

Observations and Results

Focused Building Inspections

As shown in Table 1, inspection activities occurred at the Charles Helmers and Bridgeport Elementary Schools. The specific findings and results are discussed below by each school location. For all areas inspected, Exponent requested that the conditions within the classrooms be representative of a normal school day. In each case, we observed that the HVAC systems were running during our inspections. Representative photos are presented in Attachment A.

Charles Helmers Elementary School

Classrooms 33, 37, and Outdoor Sample Locations

A teacher who has worked in room 32 for approximately one and a half years reported that she has experienced the following symptoms at various times since October 2017: scratchy throat, hoarseness, watering eyes, discharge from the ear, headaches (particularly at the end of the day). The teacher was present during the inspection and was interviewed by Exponent. The teacher reported that she noticed that her symptoms went away over winter break while she was not working in the classroom for approximately three weeks. She reported that musty odors

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generally occurred in the room and that there was no trend in the odor observations. She did not report any comfort concerns with this classroom (i.e., temperature or stuffiness). The teacher moved to room 33 two weeks ago and did not associate symptoms with that classroom. However, she did report that she experienced similar symptoms a few days ago while occupying room 33. Two outdoor sample locations located adjacent to the air handling unit (AHU) supplying air to rooms 33 and 37 were identified.

Principal and Administrative Intern Offices

Based on information from the school district representatives, the principal is reportedly currently occupying the principal's office. The principal reportedly broke out in hives and rashes prior to our inspection. The office was cleaned immediately after the complaint. Based on information from school district representatives, accessible surfaces and contents within the principal's office were cleaned with a broad spectrum disinfectant (AIRx 44) on February 1, 2018. Prior principals have not exhibited similar complaints. The administrative intern's office was inspected for comparative purposes and has no known complaints.

Results

The results from the spore-trap air samples obtained during this inspection are presented in the Aemtek report, dated February 8, 2018, and annotated with "Helmets" (Attachment B). Samples analyzed for fungal spores were collected in the portable classrooms. No air samples were collected in the administrative offices. The sample numbers and corresponding locations are presented in the following list:

Sample No.	Location
CH-OA2	Outdoor – Near air intake of portable classroom 33
CH-OA3	Outdoor – Near air intake of portable classroom 37
CH-371	East/center of portable classroom 37
CH-372	West/center of portable classroom 37
CH-331	West side of classroom near teacher's desk, portable classroom 33
CH-332	East side of classroom near work tables, portable classroom 33
CH-OA4	Outdoor – Same location as CH-OA2
CH-OA5	Outdoor – Same location as CH-OA3
CH-OA1	Field Blank

Normally, indoor fungal spores are present at or below the outdoor concentrations with the most abundant indoor types mimicking the most abundant outdoor types. The results of the air samples obtained indoors relative to outdoor air revealed normal levels which were below outdoor levels and typical outdoor airborne fungal spore types. No spores were detected in the field blank.

The tape lift samples from areas of discoloration observed on the HVAC fins in both classrooms 33 and 37 (CH-T1 and CH-T2, respectively) indicated some *Aspergillus/Penicillium-like* in both samples and hyphal fragments in sample CH-T1 only. Photographs of these two sample locations are shown in Photos 2 and 3. These fungal types are typically found in both indoor and outdoor environments. Since there is only a small amount of spores, and only a few hyphal fragments identified in the samples, this is considered to be a normal and typical finding on the surfaces sampled, and the discoloration is not fungal growth. The bulk sample collected from beneath the artificial turf was identified as the fruiting body of *Calvatia* or commonly known as a puffball. *Basidiospores* were also identified in the samples, which can be generated by puffball and mushroom fungi.

We calculated airflow rates for both classrooms. As shown in Table 2, this classroom had outdoor air supply that were 11 and 1 for classrooms 37 and 33, respectively, and were below the California Building Code (required 15 CFM/occupant) and the ANSI/ASHRAE standards for classrooms (13 to 15 CFM/occupant). Occupancy values were provided to Exponent by the school district. A recommendation is offered at the end of this report based on this finding.

In addition, we noted the following during the visual assessment of the AHUs:

- The HVAC systems are equipped with automated economizer systems, which were noted to be operational. These systems control the flow of outdoor air into the classrooms.
- The HVAC systems were noted to be in the “Fan on” mode, which means the fan is running continuously supplying outside air into the classrooms.
- The air filters did not appear to have excessive accumulation of dust or debris. We understand that the filters are changed on an approximately quarterly basis as part of a preventative maintenance program for the AHUs by the school district.
- Aside from some staining observed on the heat exchanger fins in both classrooms, there were no readily apparent visual signs of corrosion, particulate accumulation, rusting, excessive moisture, or suspected fungal growth on the surfaces inspected. This included the accessible portions of the heat exchanger, condensation tray, filters, and readily accessible inner compartment of the AHUs.
- Condensation drains should be inspected to assure that they drain outside of the AHU and some distance away from the structure to avoid water accumulation near the foundation of the portable classrooms. Some of the portable classrooms had drain lines that dripped on the portable’s exterior siding (Photo 1).

As noted in Table 3, all relative humidity measurements and temperature measurements were normal. Relative humidity was low on the day of inspection and ranged from 10.4 to 22.7% and 17.6 to 26.8% outdoors and in all rooms inspected, respectively. VOC concentrations indoors were generally higher than outdoors, but were well below the screening level of 200 to 300 ppb used in this study. The particulate matter concentrations measured in this study were generally of similar magnitude as the concentrations found outdoors, which is normal.

No unusual odors were observed during the inspection of both portable classrooms. A sweet and sour odor was observed in the administrative intern’s office in the administrative building. No obvious source of the odor was identified during our inspection.

In the administrative building, the concentrations of VOCs and suspended particulates in the principal’s office (complaint office) and administrative intern’s office (non-complaint room), were of similar magnitude, which is normal. The principal’s office temperature was elevated relative to the other indoor rooms inspected with an average temperature range of 78.1 to 80.2°F.

No wet building materials were identified during our inspection. Some staining was observed on the back of a ceiling tile in Room 37 and along the structural beam in Room

37; however, no fungal growth was suspected on these surfaces based on the visual examination.

Bridgeport Elementary School

Classrooms E4 and D2

These two classrooms currently have experienced indoor environmental quality and health effect complaints from teachers. In addition, the teachers in these classrooms have reported staining on the concrete slab under the carpet tiles. As part of Exponent's inspection, we requested that the teachers mark the locations in their classrooms where they observed the staining. As noted in Exponent's November 15, 2017, report, these classrooms have undergone some treatment of the concrete slab to prevent subsurface water from migrating upward through the slab and into the classrooms. These two classrooms received such treatments.

Exponent collected samples for the analysis of fungal spores using the same methods noted above for Charles Helmers Elementary School. In addition, we also collected VOC measurements, suspended particulate measurements, temperature, and relative humidity readings, as noted in Table 1.

Exponent also inspected the concrete slab underneath carpet tiles in E4 and D2. We inspected all locations where the teachers identified staining. In addition, one carpet tile was lifted and inspected in each of the corners of the rooms. We inspected for the presence of obvious staining or residual moisture and tested for moisture levels in the slab using a concrete moisture meter, as previously described. Further, we noted the presence of obvious liquid water beneath the carpet tile, as summarized in Table 4. Examples of staining and liquid water observed are shown in Photos 4 through 7. In addition, areas where peeling vinyl wall paper was observed in these classrooms were inspected as well by gently peeling back small corners and seams and inspecting the gypsum wallboard underneath the wallpaper (Photographs 8 and 9). No elevated levels of moisture were detected in the walls in the areas where peeling wall paper was observed.

Classrooms E2, D3, A9, and Outdoor Sample Locations

Three classrooms that do not currently have complaints based on information from the school district representatives were also inspected using the methods and approaches outlined for classroom E4 and D2. Three outdoor sample locations were located in the courtyard between the A, D, and E buildings; on the roof of building E and adjacent to the air handling unit (AHU) supplying air to classroom E4; and on the roof Building A and adjacent to the AHU that services A9.

Results

The results from the spore-trap air samples obtained during this inspection are presented in the Aemtek report dated February 8, 2018, and annotated with “Bridgeport” (Attachment C). Samples were collected in the classrooms identified above and at three outdoor locations. The sample numbers and corresponding locations are presented in the following list:

Sample No.	Location
BP-OA2	Outdoor – Courtyard between Buildings A, D, and E
BP-OA3	Outdoor – Adjacent to AHU for Room E4
BP-E2-1	Near teacher’s desk, Room E2
BP-E2-2	Near southwest corner desks, Room E2
BP-E4-1	Near teacher’s desk and marked floor tiles, Room E4 (2 air purifiers operating in room)
BP-E4-2	Near south wall and desks, Room E4 (2 air purifiers operating in room)
BP-D2-1	Near desks and marked floor tiles on west wall, Room D2 (2 air purifiers operating in room)
BP-D2-2	Near desks and work station, east, Room D2 (2 air purifiers operating in room)
BP-D3-1	Near teacher’s desk, Room D3
BP-D3-1	Center of room, Room D3
BP-OA4	Same location as BP-OA3
BP-OA5	Same location as BP-OA2
BP-OA6	Near AHU Intake for Room A9, Roof of Building A
BP-A9-1	Center of room, Room A9
BP-A9-2	Near teacher’s desk, Room A9
BP-OA7	Near AHU Intake for Room A9, Roof of Building A
BP-OA1	Field Blank

The results of the air samples obtained indoors relative to outdoor air revealed normal levels which were below outdoor levels and typical outdoor airborne fungal spore types. No spores were detected in the field blank.

As noted in Table 4, with the exception of A9, all classrooms inspected had at least one area of visible staining or visible liquid water underneath the carpet tiles inspected. In addition, we collected several tape lift samples from representative stains from stains located in Classrooms E2, E4 and D2, as shown in the Aemtek, Inc. report Dated February 8, 2018 (Attachment C). A sample from E2 with no staining was also collected as a point of comparison representing a visually un-impacted area (BP-E4-T3). The sample results show low levels of *Aspergillus/Penicillium-like* and *Cladosporium* spores and hyphal fragments in two samples (BP-E2-T2 and BP-D2-T1). Some spores were detected in all samples at low levels, including the location without visible staining. These are also common fungal spore types found in the environment and do not appear to be indicative of fungal growth beneath the carpet based on the conditions observed during this inspection. Moisture meter measures in the concrete slab indicated that rooms E4 and E2 had the highest readings at 5.5% and 6%, respectively. Measurements in D2 and D3 were generally lower and were around 4%. Concrete moisture meter measurements are presented in Table 4. Exemplar photographs of the staining and liquid water observed beneath the carpet tiles are provided in Photos 4 to 7.

As shown in Table 4, the observations of higher VOC concentrations indoors relative to outdoors in some classrooms were not considered abnormal. Further, VOC concentrations were well below the U.S. Green Building Council's screening concentration range of 200 to 300 ppb.

The relative humidity on the day of sampling was low outdoors, which translated to low relative humidity measurements indoors. Relative humidity ranged from 6.8 to 21.4% and 5.0 to 15.2% at indoor and outdoor locations, respectively, as shown in Table 4.

Air Handling Units (AHUs) for Rooms A9 and E4

Exponent visually inspected the AHUs for A9 and E4. We noted the following during the visual assessment of the AHUs:

- All of the economizers were activated to control the flow of outdoor air into the classrooms.
- The air filters did not appear to have excessive accumulation of dust or debris. We understand that the filters are changed on an approximately quarterly basis as part of preventative maintenance.
- There were no readily apparent visual signs of corrosion, particulate accumulation, rusting, excessive moisture, or fungal growth on the surfaces inspected. These included the accessible portions of the heat exchanger, condensation tray, filters, and readily accessible inner compartment of the AHUs.

- The economizers were open more (width of four fingers) than during the previous inspections, which is consistent with our recommendations in the May 23 and November 15, 2017 reports.

Summary and Recommendations

We did not identify any hazardous indoor air quality conditions within the areas of the schools inspected on February 3, 2018. All VOC and suspended particulate measurements were at low or normal concentrations with no unusual findings. No visible evidence of unusual fungal growth was observed on the accessible surfaces inspected at both Charles Helmers and Bridgeport Elementary Schools. In the areas where staining was observed or suspected, the surface testing results did not indicate abnormal conditions. Exponent has the following recommendations based on our inspection and the review of documentation noted in this report.

Charles Helmers Elementary School, Portable Classrooms

- Ventilation for Classrooms 33 and 37 were below code requirements (Table 2). We suggest opening the economizers on Portables 33 and 37 as much as possible to increase the amount of outdoor air. The other portable classrooms should also undergo additional inspection by a ventilation balancing contractor to assure they are up to code. A ventilation balancing contractor should be consulted to verify outdoor air supply is adequate relative to building code requirements.
- The temperature range in the principal's office was high the day of our inspection. The system maintaining thermal comfort in this space should be checked to assure it is maintaining adequate temperatures for thermal comfort, as noted in the USEPA Tools for Schools Guideline, which the school district uses as a guideline for their schools.³

Bridgeport Elementary School

- Based on the observed staining and visible moisture under the carpet tiles in classrooms E2, E4, D2, and D3, further investigation as to the extent and cause of the moisture intrusion is needed. This may involve consultation with additional flooring experts and materials scientists to find a solution to the issue.
- Exponent understands that the school district has contacted an HVAC design expert and is working to improve the systems in the C, D, and E buildings, with which we generally agree based on our historical observations at this school site.

³ U.S. EPA. 2009. Indoor Air Quality Tools for Schools Reference Guide. EPA 402/K-07/008. January.

General Recommendations for All Schools

- Relative humidity should be periodically monitored within the classrooms, particularly in the routinely occupied rooms within the C, D, and E buildings, to assure they are maintained at levels consistent with the recommendations in USEPA's Tool for Schools Guideline.⁴ Low humidity levels were measured during the inspection. However, this is likely attributed to unusually low outdoor relative humidity levels observed.

Limitations

This assessment was limited to visible and accessible surfaces and the conditions that existed on February 3, 2017. We did not inspect interstitial spaces, such as above dropped ceilings (except where accessible in Room 37 at Charles Helmers Elementary School), inside walls, and crawl spaces, and do not offer any opinions on the conditions of those spaces. The surface and air sampling reflected the conditions that existed at the time of this evaluation, and such conditions may be different at other times. If the district is aware of building materials or contents not specified within this report that are suspected of containing fungal growth, those materials should be evaluated as appropriate.

Exponent investigated specific issues relevant to the evaluation as provided by the client. Therefore, the scope of services performed during this assessment may not adequately address the needs of others, and any re-use of or reliance on this report or the findings, conclusions, or recommendations presented herein is at the sole risk of the user. If any errors in this report are discovered, please notify us so that we can respond to any concerns.

This completes our focused evaluation of the Charles Helmers and Bridgeport Elementary Schools in Valencia, California. If you have any questions or require any additional information, please contact me via phone at 510-268-5077.

⁴ *Ibid.*

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Sincerely,



Michael Posson, CIH
Managing Scientist



Attachment A: Photographs

Attachment B: Aemtek Report Dated February 8, 2018 (“Helmets”)

Attachment C: Aemtek Report Dated February 8, 2018 (“Bridgeport”)

Tables

Table 1. Summary of Areas Inspected, February 3, 2018

School	Area/Classroom Number(s) Inspected	Activities	Reported Issue/Item Inspected
Charles Helmers Elementary	Rooms 33 and 37	<ul style="list-style-type: none"> -Visual inspection and odor observations. -Collection of air, surface and bulk samples for analysis for fungal spores. -Moisture meter measurements in construction materials. -Relative humidity and temperature measurements. -VOC screening with PID. -Suspended particulate measurements with DustTrak. -Measurement of outside air supply to room. 	Reported health issue claimed related to indoor environmental quality in Room 37; Room 33 used as a point of comparison.
	Principal's Office and Administrative Intern's Office	<ul style="list-style-type: none"> -Visual inspection and odor observations. -Moisture meter measurements in construction materials. -Relative humidity and temperature measurements. -VOC screening with PID. -Suspended particulate measurements with DustTrak. 	Reported health issue claimed related to indoor environmental quality in the Principal's Office. Administrative intern's office used as a point of comparison.
Bridgeport Elementary	Rooms E2, E4, D2, D3, and A9	<ul style="list-style-type: none"> -Visual inspection and odor observations. -Inspection beneath carpet tiles. -Collection of air and surface samples for analysis for fungal spores. -Moisture meter measurements in construction materials. -Relative humidity and temperature measurements. -VOC screening with PID. -Suspended particulate measurements with DustTrak. -Measurement of outside air supply to room. 	Reported health issue claimed related to indoor environmental quality in Rooms D2 and E4; Rooms E2, D3 and A9 used as a point of comparison.

Table 2. Summary of Outdoor Air Supply Calculations for Select Air Handling Units (AHUs) (All ventilation measurement values are cubic feet per minute of outdoor air)

Classroom	Economizer Status	Airflow (CFM OA)	Occupants	CFM OA/ Occupant
Charles Helmers Elementary School				
Portable 33	Closed	45	28	1
Portable 37	Open	304	28	11

**Occupancy values provided by Saugus School District. An increase in occupant # will decrease the CFM/Occupant.

CFM = Cubic feet per minute

OA = Outdoor air

Table 3. Summary of Observations, Charles Helmers Elementary School

Location^a	Odor	PID Readings^b At Sample Location (ppb)	Total Suspended Particulate (mg/m³)^b	PM10 (mg/m³)^b	PM2.5 (mg/m³)^b	Relative Humidity^c (%)	Temperature^c (°F)
Outside 1 (CH-OA2)	None	8-10	0.004	0.002	0.001	22.7	72.4
Outside 2 (CH-OA3)	Grass/dirt	47-50	0.030	0.005	0.003	16.2	78.7
Class 37 (CH-371)	None	13-15	0.005	0.001	0.000	24.4	70.9
Class 37 (CH-372)	None	20-21	0.034	0.004	0.002	25.1	70.2
Class 33 (CH-331)	Glue or paint	13	0.037	0.010	0.004	31.9	71.1
Class 33 (CH-332)	Glue or paint	56-70	0.032	0.008	0.003	32.6	70.7
Outside 1 (CH-OA4)	None	0-6	0.011	0.002	0.001	10.4	87.7
Outside 2 (CH-OA5)	Grass/dirt	0-22	0.016	0.004	0.02	10.9	86.5
Principal Office, Table	None	63-64	0.016	0.002	0.001	19.2	78.1
Principal Office, Desk	None	60-61	0.005	0.000	0.000	17.6	80.2
Intern Office, Table	Sweet/Sour	32-33	0.037	0.015	0.007	23.4	72.9
Intern Office, Desk	Sweet/Sour	48-49	0.087	0.015	0.006	26.8	72.1

NOTES:

^a Sample number for fungal spore sample listed in parenthesis.

^b PID = photoionization detector; ppb = parts per billion; mg/m³ = milligrams per cubic meter

^c Numbers provided are an average of three different readings.

Table 4. Summary of Observations, Bridgeport Elementary School

<i>Location</i>	<i>Oder</i>	Visible Staining/Water-Observed Under One or More Carpet Tiles in Room	Highest Concrete Moisture Meter Reading (%)	PID Readings at Sample Location (ppb)	Total Suspended Particulate (mg/m³)	PM10 (mg/m³)	PM2.5 (mg/m³)	Relative Humidity^c (%)	Temperature^c (°F)
<i>Outside 1 (BP-OA2)</i>	None	NA	NA	0	0.018	0.006	0.002	15.2	89.1
<i>Outside 2 (BP-OA3)</i>	None	NA	NA	2-3	0.001	0.001	0.001	13.1	89.3
<i>Room E2 (BP-E2-1)</i>	None	Yes	6	12-13	0.024	0.005	0.002	13.6	72.4
<i>Room E2 (BP-E2-2)</i>	None	Yes	6	24-25	0.033	0.001	0.001	18.7	75.1
<i>Room E4 (BP-E4-1)</i>	None	Yes	5.5	37	0.031	0.012	0.009	18.6	75.1
<i>Room E4 (BP-E4-2)</i>	None	Yes	5.5	33	0.023	0.004	0.001	19.3	69.9
<i>Room D2 (BP-D2-1)</i>	Strong air freshener	Yes	4	50-51	0.022	0.001	0.000	20.6	70.0
<i>Room D2 (BP-D2-2)</i>	Strong air freshener	Yes	4	52	0.001	0.001	0.000	21.4	70.5
<i>Room D3 (BP-D3-1)</i>	Strong air freshener	No	4	79-80	0.009	0.004	0.001	19.5	70.6
<i>Room D3 (BP-D3-1)</i>	Strong air freshener	No	4	79	0.016	0.002	0.001	18.3	74.1
<i>Outside 2 (BP-OA4)</i>	None	NA	NA	59-60	0.014	0.002	0.001	5.0	87.7

Table 4. Summary of Observations, Bridgeport Elementary School (continued)

<i>Location</i>	<i>Oder</i>	Visible Staining/Water-Observed Under One or More Carpet Tiles in Room	Highest Concrete Moisture Meter Reading (%)	PID Readings at Sample Location (ppb)	Total Suspended Particulate (mg/m³)	PM10 (mg/m³)	PM2.5 (mg/m³)	Relative Humidity^c (%)	Temperature^c (°F)
<i>Outside 1 (BP-OA5)</i>	None	NA	NA	33-38	0.024	0.006	0.002	9.5	88.4
<i>Outside 3 (BP-OA6)</i>	None	NA	NA	14-15	0.001	0.001	0.000	11.3	77.6
<i>Room A9 (BP-A9-1)</i>	None	No	NA	17-18	0.005	0.002	0.001	11.7	74.3
<i>Room A9 (BP-A9-2)</i>	None	No	NA	29	0.047	0.003	0.001	6.8	82.5
<i>Outside 3 (BP-OA7)</i>	None	NA	NA	9	0.020	0.004	0.002	15.2	89.1

NOTES:

^a Sample number for fungal spore sample listed in parenthesis.

^b PID = photoionization detector; ppb = parts per billion; mg/m³ = milligrams per cubic meter.

^c Numbers provided are an average of three different readings.

Attachment A

Photographs



Photo 1. Example of Air Sample Setup



Photo 2. Surface Sample from AHU on Room 33



Photo 3. Surface Sample from AHU on Room 37



Photo 4. Example of Floor Staining and Liquid Water Under Carpet, Room E2

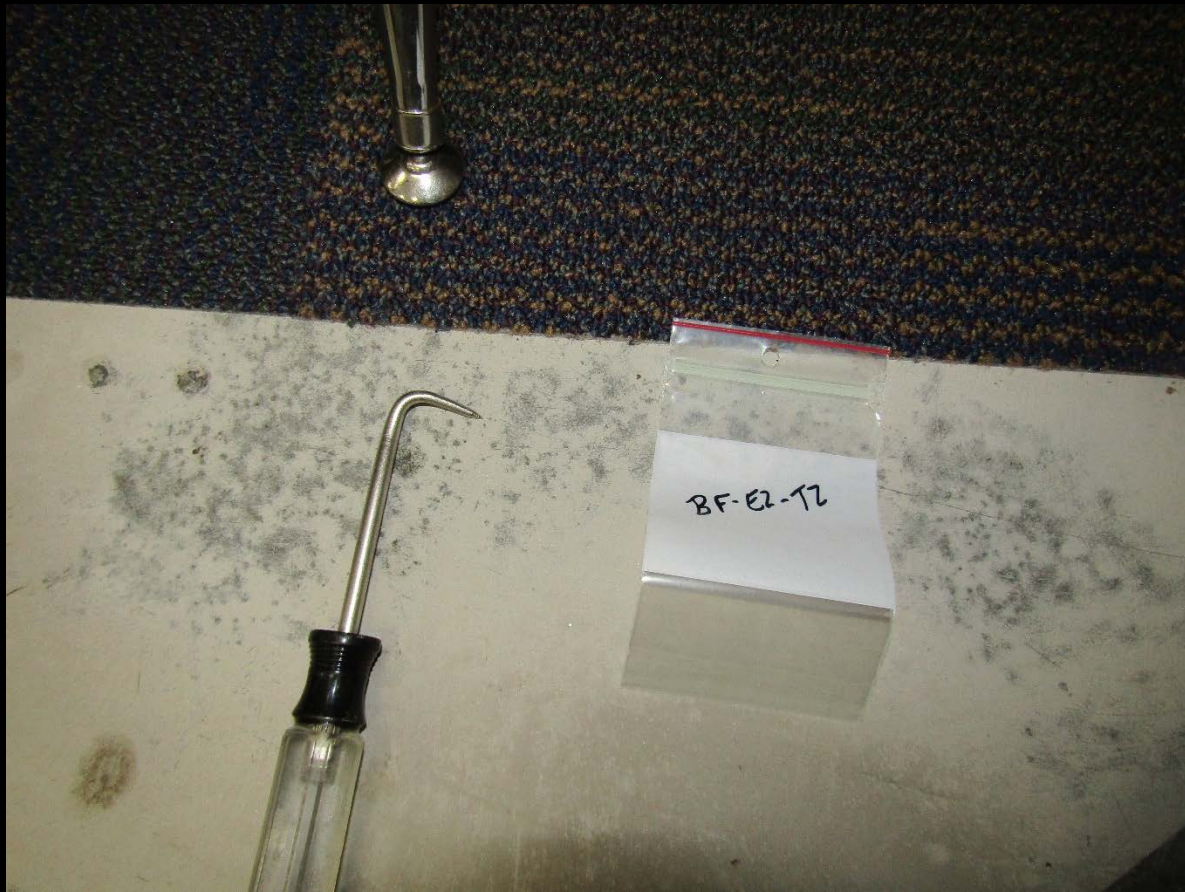


Photo 5. Example of Floor Staining Under Carpet, Room E2



Photo 6. Example of Floor Staining and Liquid Water Under Carpet, Room E4



Photo 7. Example of Floor Staining and Liquid Water Under Carpet, Room D2



Photo 8. Example of Moisture Meter Measurement Near Peeling Wall Paper, Room E4



Photo 9. Example of Inspection of Wallpaper Backing and Gypsum Drywall, Room E4

Attachment B

**AEMTEK, Inc. Analytical
Report, Charles Helmers
Elementary School**

466 Kato Terrace
Fremont, CA 94539
Phone: (510) 979-1979 Fax: (510) 668-1980
www.aemtek.com labreports@aemtek.com

Submitted to: **Exponent, Inc**
475 14th Street, Suite 400
Oakland, CA 94612
Attn: **Michael Posson**

Purpose: The purpose of this report is to present laboratory results obtained by analyzing the samples submitted to Aemtek, Inc. The report includes this cover and the data sheet(s).

Limitation: The test results presented in this report are only related to the samples supplied by the client and analyzed by Aemtek. This report shall not be reproduced, except in full, without written authorization of Aemtek. Aemtek shall have no liability to anyone with respect to any interpretations or uses of the laboratory report, decisions made or actions taken as a result of or based on the data reported. In no event shall Aemtek's liability with respect to the reported test results exceed the amount paid for the project by the client to Aemtek.

Sample Information: Sample identification, location, volume, weight, and area are from the client's Chain of custody. Unless specifically noted, the samples were received in acceptable condition.

Significant Figures: Because of the nature of the biological samples and analytical methods, the number of significant figures should generally be one of two, although the actual calculation results are reported.

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Confidentiality: Aemtek shall not provide analytical results or client's project information to any party other than the client, unless requested by the client, in writing, or by law.

About Aemtek: Aemtek, Inc. is an environmental microbiology laboratory providing reliable, fast, and expert laboratory services for the detection, identification, and analysis of microorganisms. We are committed to excellence in quality, service, and technology. All analysts are experienced Ph.D. specialists. The laboratory is accredited by the American Industrial Hygiene Association (AIHA) in the Environmental Microbiology liability with respect to the reported test results exceed the Laboratory Accreditation Program (EMLAP Lab #167620).

Project ID: 1703766.000

Location: Helmers

Sampling Date: 02-05-2018

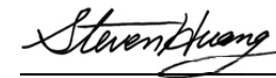
Sample Received: 02-06-2018

Data Reported: 02-08-2018

Approved By:



Dr. Florence Wu
Principal Mycologist



Dr. Steven Huang
Laboratory Director



Aemtek Laboratory Report, Page 1 of 4



Laboratory Analysis Report

Aemtek No. 1802236

Data Sheet

466 Kato Terrace
 Fremont, CA 94539
 Phone: 510-979-1979
 Fax: 510-668-1980

Project ID: 1703766.000
 Project Location: Helmers
 Analysis Performed: Fungal Direct Examination (FDE)
 Sample Type: Air

Submitted to:
 Exponent, Inc
 Oakland, CA 94612

Sample ID	CH-OA1			CH-OA2			CH-OA3			CH-371			CH-372		
Location	CH-OA1			CH-OA2			CH-OA3			CH-371			CH-372		
Air Volume (L)	75			75			75			75			75		
Fungal Identification	Count	Spores/m ³	%	Count	Spores/m ³	%	Count	Spores/m ³	%	Count	Spores/m ³	%	Count	Spores/m ³	%
<i>Alternaria</i>	-	-	-	1	13	1	-	-	-	-	-	-	-	-	-
Ascospores	-	-	-	2	26	2	4	52	4	-	-	-	-	-	-
<i>Aspergillus/Penicillium</i> -like	-	-	-	45	585	45	34	442	37	5	65	100	-	-	-
Basidiospores	-	-	-	23	299	23	13	169	14	-	-	-	2	26	29
<i>Bipolaris/Dreschlera</i>	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
<i>Botrytis</i>	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
<i>Cercospora</i>	-	N	-	-	-	-	-	-	-	-	-	-	-	-	-
<i>Chaetomium</i>	-	O	-	-	-	-	-	-	-	-	-	-	-	-	-
<i>Cladosporium</i>	-	N	-	13	169	13	13	169	14	-	-	-	1	13	14
<i>Curvularia</i>	-	E	-	-	-	-	-	-	-	-	-	-	-	-	-
<i>Epicoccum</i>	-	-	-	-	-	-	1	13	1	-	-	-	-	-	-
<i>Ganoderma</i>	-	D	-	-	-	-	-	-	-	-	-	-	-	-	-
<i>Myxomycetes/Periconia/Rust/Smut</i>	-	E	-	6	78	6	16	208	17	-	-	-	2	26	29
<i>Nigrospora</i>	-	T	-	1	13	1	-	-	-	-	-	-	-	-	-
<i>Oidium</i>	-	E	-	-	-	-	-	-	-	-	-	-	-	-	-
<i>Petriella</i>	-	C	-	-	-	-	-	-	-	-	-	-	-	-	-
<i>Pithomyces</i>	-	T	-	-	-	-	-	-	-	-	-	-	-	-	-
<i>Stachybotrys</i>	-	E	-	-	-	-	-	-	-	-	-	-	-	-	-
<i>Stemphylium</i>	-	D	-	-	-	-	-	-	-	-	-	-	-	-	-
<i>Torula</i>	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
<i>Trichoderma</i> -like	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
<i>Ulocladium</i>	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Other hyaline spores	-	-	-	5	65	5	7	91	8	-	-	-	1	13	14
Other colored spores	-	-	-	1	13	1	1	13	1	-	-	-	-	-	-
Hyphal fragments	-	-	-	2	26	2	3	39	3	-	-	-	1	13	14
Total	-	-	-	99	1287	100	92	1196	100	5	65	100	7	91	100
Pollen/m ³	-			2275			494			13			26		
Insect or dust mite parts/m ³	-			-			-			-			-		
Detection Limit (spores/m ³)	13			13			13			13			13		
General Density	1-25%			26-50%			26-50%			1-25%			1-25%		
% of Trace Analyzed	100%			100%			100%			100%			100%		

Method ID: Aemtek SOP AF101
 Sampling Date: 02-05-2018
 Analysis Performed By: Dr. Brook Liu
 Date of Analysis: 02-08-2018

Direct microscopy detection limit: One spore or one hyphal Fragment per sample.

Reviewed By:

Laboratory Analysis Report

Data Sheet

 466 Kato Terrace
 Fremont, CA 94539
 Phone: 510-979-1979
 Fax: 510-668-1980

 Project ID: 1703766.000
 Project Location: Helmers
 Analysis Performed: Fungal Direct Examination (FDE)
 Sample Type: Air

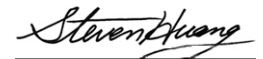
 Submitted to:
 Exponent, Inc
 Oakland, CA 94612

Sample ID	CH-331			CH-332			CH-OA4			CH-OA5					
Location	CH-331			CH-332			CH-OA4			CH-OA5					
Air Volume (L)	75			75			75			75					
Fungal Identification	Count	Spores/m ³	%	Count	Spores/m ³	%	Count	Spores/m ³	%	Count	Spores/m ³	%	Count	Spores/m ³	%
<i>Alternaria</i>	-	-	-	-	-	-	1	13	1	-	-	-	-	-	-
Ascospores	2	26	14	1	13	5	5	65	6	3	39	5	-	-	-
<i>Aspergillus/Penicillium</i> -like	3	39	21	13	169	59	35	455	43	29	377	48	-	-	-
Basidiospores	2	26	14	1	13	5	18	234	22	7	91	12	-	-	-
<i>Bipolaris/Dreschlera</i>	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
<i>Botrytis</i>	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
<i>Cercospora</i>	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
<i>Chaetomium</i>	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
<i>Cladosporium</i>	3	39	21	3	39	14	12	156	15	10	130	17	-	-	-
<i>Curvularia</i>	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
<i>Epicoccum</i>	-	-	-	-	-	-	1	13	1	-	-	-	-	-	-
<i>Ganoderma</i>	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Myxomycetes/ <i>Periconia</i> /Rust/Smut	1	13	7	2	26	9	2	26	2	2	26	3	-	-	-
<i>Nigrospora</i>	-	-	-	-	-	-	1	13	1	-	-	-	-	-	-
<i>Oidium</i>	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
<i>Petriella</i>	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
<i>Pithomyces</i>	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
<i>Stachybotrys</i>	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
<i>Stemphylium</i>	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
<i>Torula</i>	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
<i>Trichoderma</i> -like	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
<i>Ulocladium</i>	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Other hyaline spores	2	26	14	1	13	5	4	52	5	6	78	10	-	-	-
Other colored spores	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Hyphal fragments	1	13	7	1	13	5	2	26	2	3	39	5	-	-	-
Total	14	182	100	22	286	100	81	1053	100	60	780	100	-	-	-
Pollen/m ³	-			-			572			585			-		
Insect or dust mite parts/m ³	-			-			-			13			-		
Detection Limit (spores/m ³)	13			13			13			13			-		
General Density	26-50%			26-50%			26-50%			26-50%			-		
% of Trace Analyzed	100%			100%			100%			100%			-		

 Method ID: Aemtek SOP AF101
 Sampling Date: 02-05-2018
 Analysis Performed By: Dr. Brook Liu
 Date of Analysis: 02-08-2018

Direct microscopy detection limit: One spore or one hyphal Fragment per sample.

Reviewed By:



Data Sheet

 466 Kato Terrace
 Fremont, CA 94539
 Phone: 510-979-1979
 Fax: 510-668-1980

 Project ID: 1703766.000
 Project Location: Helmers
 Analysis Performed: Fungal Direct Examination (FDE)
 Sample Type: Tape-lift

 Submitted to:
 Exponent, Inc
 Oakland, CA 94612

Sample ID	CH-T1	CH-T2						
Location	CH-T1	CH-T2						
Sample Type	Tape-lift	Tape-lift						
Fungal Identification	Characterization	Characterization						
<i>Acremonium</i>	-	-	-	-	-	-	-	-
<i>Alternaria</i>	-	-	-	-	-	-	-	-
Ascospores	-	-	-	-	-	-	-	-
<i>Aspergillus</i>	-	-	-	-	-	-	-	-
<i>Aspergillus/Penicillium-like</i>	Some	Rare	-	-	-	-	-	-
<i>Aureobasidium</i>	-	-	-	-	-	-	-	-
Basidiospores	-	-	-	-	-	-	-	-
<i>Bipolaris/Dreschlera</i>	-	-	-	-	-	-	-	-
<i>Botrytis</i>	-	-	-	-	-	-	-	-
<i>Ceratocystis/Ophiostoma</i>	-	-	-	-	-	-	-	-
<i>Chaetomium</i>	-	-	-	-	-	-	-	-
<i>Cladosporium</i>	-	-	-	-	-	-	-	-
<i>Curvularia</i>	-	-	-	-	-	-	-	-
<i>Epicoccum</i>	-	-	-	-	-	-	-	-
<i>Mucor</i>	-	-	-	-	-	-	-	-
Myxomycetes/ <i>Periconia</i> /Rust/Smut	-	-	-	-	-	-	-	-
<i>Nigrospora</i>	-	-	-	-	-	-	-	-
<i>Penicillium</i>	-	-	-	-	-	-	-	-
<i>Petriella</i>	-	-	-	-	-	-	-	-
<i>Pithomyces</i>	-	-	-	-	-	-	-	-
<i>Stachybotrys</i>	-	-	-	-	-	-	-	-
<i>Stemphylium</i>	-	-	-	-	-	-	-	-
<i>Torula</i>	-	-	-	-	-	-	-	-
<i>Triadelphia</i>	-	-	-	-	-	-	-	-
<i>Trichoderma-like</i>	-	-	-	-	-	-	-	-
<i>Ulocladium</i>	-	-	-	-	-	-	-	-
Other hyaline spores	-	-	-	-	-	-	-	-
Other colored spores	-	-	-	-	-	-	-	-
Hyphal fragments	Rare	-	-	-	-	-	-	-

Data Interpretation Guideline:

Rare 1 to 10 spores observed on sample preparation
Some 11 to 30 spores observed on sample preparation
Common 31-60 spores observed per sample preparation
Many 61 to 100 spores observed per sample preparation
Abundant More than 100 spores observed per sample preparation
TNTC Too numerous to count, but no fruiting structure observed
Colony Abundant or numerous spores and associated fruiting structures observed
***** Spores associated with hyphae and/or fruiting structures
None Detected No spore or hyphal fragment observed per sample preparation

Method ID: Aemtek SOP AF102
 Direct microscopy detection limit: one spore/hyphal fragment per sample.
 Analysis performed by: Dr. Brook Liu
 Sampling Date: 02-05-2018
 Date of Analysis: 02-08-2018

 Reviewed by: 

Attachment C

**AEMTEK, Inc. Analytical
Report, Bridgeport
Elementary School**

466 Kato Terrace
Fremont, CA 94539
Phone: (510) 979-1979 Fax: (510) 668-1980
www.aemtek.com labreports@aemtek.com

Submitted to: Exponent, Inc
475 14th Street, Suite 400
Oakland, CA 94612
Attn: Michael Posson

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Project ID: 1703766

Location: Bridgeport

Sampling Date: 02-03-2018

Sample Received: 02-06-2018

Data Reported: 02-08-2018

Approved By:



Dr. Florence Wu
Principal Mycologist



Dr. Steven Huang
Laboratory Director



Aemtek Laboratory Report, Page 1 of 7



Laboratory Analysis Report

Aemtek No. 1802235

Data Sheet

466 Kato Terrace
 Fremont, CA 94539
 Phone: 510-979-1979
 Fax: 510-668-1980

Project ID: 1703766
 Project Location: Bridgeport
 Analysis Performed: Fungal Direct Examination (FDE)
 Sample Type: Air

Submitted to:
 Exponent, Inc
 Oakland, CA 94612

Sample ID	BP-OA1			BP-OA2			BP-OA3			BP-E2-1			BP-E2-2		
Location	BP-OA1			BP-OA2			BP-OA3			BP-E2-1			BP-E2-2		
Air Volume (L)	75			75			75			75			75		
Fungal Identification	Count	Spores/m ³	%	Count	Spores/m ³	%	Count	Spores/m ³	%	Count	Spores/m ³	%	Count	Spores/m ³	%
<i>Alternaria</i>	-	-	-	1	13	3	-	-	-	-	-	-	-	-	-
Ascospores	-	-	-	-	-	-	1	13	4	-	-	-	-	-	-
<i>Aspergillus/Penicillium</i> -like	3	39	75	17	221	55	7	91	28	2	26	67	1	13	20
Basidiospores	1	13	25	1	13	3	2	26	8	1	13	33	2	26	40
<i>Bipolaris/Dreschlera</i>	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
<i>Botrytis</i>	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
<i>Cercospora</i>	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
<i>Chaetomium</i>	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
<i>Cladosporium</i>	-	-	-	4	52	13	3	39	12	-	-	-	1	13	20
<i>Curvularia</i>	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
<i>Epicoccum</i>	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
<i>Ganoderma</i>	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
<i>Myxomycetes/Periconia/Rust/Smut</i>	-	-	-	1	13	3	5	65	20	-	-	-	-	-	-
<i>Nigrospora</i>	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
<i>Oidium</i>	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
<i>Petriella</i>	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
<i>Pithomyces</i>	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
<i>Stachybotrys</i>	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
<i>Stemphylium</i>	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
<i>Torula</i>	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
<i>Trichoderma</i> -like	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
<i>Ulocladium</i>	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Other hyaline spores	-	-	-	3	39	10	2	26	8	-	-	-	1	13	20
Other colored spores	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Hyphal fragments	-	-	-	4	52	13	5	65	20	-	-	-	-	-	-
Total	4	52	100	31	403	100	25	325	100	3	39	100	5	65	100
Pollen/m ³	-			234			156			26			-		
Insect or dust mite parts/m ³	-			-			-			-			-		
Detection Limit (spores/m ³)	13			13			13			13			13		
General Density	1-25%			1-25%			1-25%			1-25%			1-25%		
% of Trace Analyzed	100%			100%			100%			100%			100%		

Method ID: Aemtek SOP AF101
 Sampling Date: 02-03-2018
 Analysis Performed By: Dr. Brook Liu & Dr. Steven Huang
 Date of Analysis: 02-08-2018

Direct microscopy detection limit: One spore or one hyphal Fragment per sample.

Reviewed By:

Laboratory Analysis Report

Data Sheet

 466 Kato Terrace
 Fremont, CA 94539
 Phone: 510-979-1979
 Fax: 510-668-1980

 Project ID: 1703766
 Project Location: Bridgeport
 Analysis Performed: Fungal Direct Examination (FDE)
 Sample Type: Air

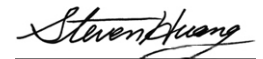
 Submitted to:
 Exponent, Inc
 Oakland, CA 94612

Sample ID	BP-E4-1			BP-E4-2			BP-D2-1			BP-D2-2			BP-D3-1		
Location	BP-E4-1			BP-E4-2			BP-D2-1			BP-D2-2			BP-D3-1		
Air Volume (L)	75			75			75			75			75		
Fungal Identification	Count	Spores/m ³	%	Count	Spores/m ³	%	Count	Spores/m ³	%	Count	Spores/m ³	%	Count	Spores/m ³	%
<i>Alternaria</i>	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ascospores	-	-	-	-	-	-	-	-	-	-	-	-	1	13	11
<i>Aspergillus/Penicillium</i> -like	2	26	33	2	26	50	2	26	25	4	52	80	2	26	22
Basidiospores	1	13	17	-	-	-	2	26	25	-	-	-	1	13	11
<i>Bipolaris/Dreschlera</i>	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
<i>Botrytis</i>	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
<i>Cercospora</i>	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
<i>Chaetomium</i>	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
<i>Cladosporium</i>	1	13	17	1	13	25	2	26	25	-	-	-	2	26	22
<i>Curvularia</i>	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
<i>Epicoccum</i>	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
<i>Ganoderma</i>	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
<i>Myxomycetes/Periconia/Rust/Smut</i>	-	-	-	1	13	25	-	-	-	-	-	-	-	-	-
<i>Nigrospora</i>	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
<i>Oidium</i>	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
<i>Petriella</i>	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
<i>Pithomyces</i>	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
<i>Stachybotrys</i>	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
<i>Stemphylium</i>	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
<i>Torula</i>	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
<i>Trichoderma</i> -like	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
<i>Ulocladium</i>	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Other hyaline spores	1	13	17	-	-	-	1	13	12	1	13	20	3	39	33
Other colored spores	1	13	17	-	-	-	1	13	12	-	-	-	-	-	-
Hyphal fragments	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Total	6	78	100	4	52	100	8	104	100	5	65	100	9	117	100
Pollen/m ³	13			13			26			-			-		
Insect or dust mite parts/m ³	-			-			-			-			-		
Detection Limit (spores/m ³)	13			13			13			13			13		
General Density	1-25%			1-25%			1-25%			1-25%			1-25%		
% of Trace Analyzed	100%			100%			100%			100%			100%		

 Method ID: Aemtek SOP AF101
 Sampling Date: 02-03-2018
 Analysis Performed By: Dr. Brook Liu & Dr. Steven Huang
 Date of Analysis: 02-08-2018

Direct microscopy detection limit: One spore or one hyphal Fragment per sample.

Reviewed By:



Laboratory Analysis Report

Data Sheet

 466 Kato Terrace
 Fremont, CA 94539
 Phone: 510-979-1979
 Fax: 510-668-1980

 Project ID: 1703766
 Project Location: Bridgeport
 Analysis Performed: Fungal Direct Examination (FDE)
 Sample Type: Air

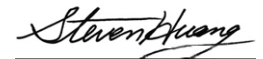
 Submitted to:
 Exponent, Inc
 Oakland, CA 94612

Sample ID	BP-D3-2			BP-OA4			BP-OA5			BP-OA6			BP-A9-1		
Location	BP-D3-2			BP-OA4			BP-OA5			BP-OA6			BP-A9-1		
Air Volume (L)	75			75			75			75			75		
Fungal Identification	Count	Spores/m ³	%	Count	Spores/m ³	%	Count	Spores/m ³	%	Count	Spores/m ³	%	Count	Spores/m ³	%
<i>Alternaria</i>	-	-	-	-	-	-	-	-	-	1	13	3	-	-	-
Ascospores	1	13	17	-	-	-	3	39	6	1	13	3	-	-	-
<i>Aspergillus/Penicillium</i> -like	2	26	33	2	26	7	24	312	48	12	156	40	4	52	57
Basidiospores	-	-	-	3	39	11	3	39	6	3	39	10	-	-	-
<i>Bipolaris/Dreschlera</i>	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
<i>Botrytis</i>	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
<i>Cercospora</i>	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
<i>Chaetomium</i>	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
<i>Cladosporium</i>	-	-	-	14	182	52	3	39	6	7	91	23	3	39	43
<i>Curvularia</i>	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
<i>Epicoccum</i>	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
<i>Ganoderma</i>	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Myxomycetes/ <i>Periconia</i> /Rust/Smut	1	13	17	2	26	7	2	26	4	-	-	-	-	-	-
<i>Nigrospora</i>	-	-	-	1	13	4	-	-	-	1	13	3	-	-	-
<i>Oidium</i>	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
<i>Petriella</i>	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
<i>Pithomyces</i>	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
<i>Stachybotrys</i>	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
<i>Stemphylium</i>	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
<i>Torula</i>	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
<i>Trichoderma</i> -like	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
<i>Ulocladium</i>	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Other hyaline spores	1	13	17	3	39	11	4	52	8	2	26	7	-	-	-
Other colored spores	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Hyphal fragments	1	13	17	2	26	7	11	143	22	3	39	10	-	-	-
Total	6	78	100	27	351	100	50	650	100	30	390	100	7	91	100
Pollen/m ³	-			403			1573			1209			78		
Insect or dust mite parts/m ³	-			-			-			-			-		
Detection Limit (spores/m ³)	13			13			13			13			13		
General Density	1-25%			26-50%			26-50%			26-50%			1-25%		
% of Trace Analyzed	100%			100%			100%			100%			100%		

 Method ID: Aemtek SOP AF101
 Sampling Date: 02-03-2018
 Analysis Performed By: Dr. Brook Liu & Dr. Steven Huang
 Date of Analysis: 02-08-2018

Direct microscopy detection limit: One spore or one hyphal Fragment per sample.

Reviewed By:





Laboratory Analysis Report

Aemtek No. 1802235

Data Sheet

466 Kato Terrace
 Fremont, CA 94539
 Phone: 510-979-1979
 Fax: 510-668-1980

Project ID: 1703766
 Project Location: Bridgeport
 Analysis Performed: Fungal Direct Examination (FDE)
 Sample Type: Air

Submitted to:
 Exponent, Inc
 Oakland, CA 94612

Sample ID	BP-A9-2			BP-OA7											
Location	BP-A9-2			BP-OA7											
Air Volume (L)	75			75											
Fungal Identification	Count	Spores/m ³	%	Count	Spores/m ³	%	Count	Spores/m ³	%	Count	Spores/m ³	%	Count	Spores/m ³	%
<i>Alternaria</i>	-	-	-	1	13	3	-	-	-	-	-	-	-	-	-
Ascospores	1	13	7	2	26	6	-	-	-	-	-	-	-	-	-
<i>Aspergillus/Penicillium</i> -like	7	91	50	12	156	34	-	-	-	-	-	-	-	-	-
Basidiospores	-	-	-	5	65	14	-	-	-	-	-	-	-	-	-
<i>Bipolaris/Dreschlera</i>	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
<i>Botrytis</i>	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
<i>Cercospora</i>	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
<i>Chaetomium</i>	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
<i>Cladosporium</i>	3	39	21	8	104	23	-	-	-	-	-	-	-	-	-
<i>Curvularia</i>	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
<i>Epicoccum</i>	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
<i>Ganoderma</i>	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
<i>Myxomycetes/Periconia/Rust/Smut</i>	-	-	-	2	26	6	-	-	-	-	-	-	-	-	-
<i>Nigrospora</i>	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
<i>Oidium</i>	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
<i>Petriella</i>	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
<i>Pithomyces</i>	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
<i>Stachybotrys</i>	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
<i>Stemphylium</i>	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
<i>Torula</i>	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
<i>Trichoderma</i> -like	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
<i>Ulocladium</i>	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Other hyaline spores	1	13	7	3	39	9	-	-	-	-	-	-	-	-	-
Other colored spores	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Hyphal fragments	2	26	14	2	26	6	-	-	-	-	-	-	-	-	-
Total	14	182	100	35	455	100	-	-	-	-	-	-	-	-	-
Pollen/m ³	65			1755			-			-			-		
Insect or dust mite parts/m ³	-			-			-			-			-		
Detection Limit (spores/m ³)	13			13			-			-			-		
General Density	1-25%			26-50%			-			-			-		
% of Trace Analyzed	100%			100%			-			-			-		

Method ID: Aemtek SOP AF101
 Sampling Date: 02-03-2018
 Analysis Performed By: Dr. Brook Liu & Dr. Steven Huang
 Date of Analysis: 02-08-2018

Direct microscopy detection limit: One spore or one hyphal Fragment per sample.

Reviewed By:



Laboratory Analysis Report

Aemtek No. 1802235

Data Sheet

466 Kato Terrace
Fremont, CA 94539
Phone: 510-979-1979
Fax: 510-668-1980

Project ID: 1703766
Project Location: Bridgeport
Analysis Performed: Fungal Direct Examination (FDE)
Sample Type: Tape-lift

Submitted to:
Exponent, Inc
Oakland, CA 94612

Sample ID	BP-E2-T1	BP-E2-T2	BP-E2-T3	BP-D2-T1	BP-D2-T2	BP-E4-T1	BP-E4-T2	BP-E4-T3
Location	BP-E2-T1	BP-E2-T2	BP-E2-T3	BP-D2-T1	BP-D2-T2	BP-E4-T1	BP-E4-T2	BP-E4-T3
Sample Type	Tape-lift	Tape-lift	Tape-lift	Tape-lift	Tape-lift	Tape-lift	Tape-lift	Tape-lift
Fungal Identification	Characterization	Characterization	Characterization	Characterization	Characterization	Characterization	Characterization	Characterization
<i>Acremonium</i>	-	-	-	-	-	-	-	-
<i>Alternaria</i>	-	-	-	-	-	-	-	-
Ascospores	-	-	-	-	-	-	-	-
<i>Aspergillus</i>	-	-	-	-	-	-	-	-
<i>Aspergillus/Penicillium</i> -like	Rare	Rare	-	-	Abundant	Rare	Rare	Rare
<i>Aureobasidium</i>	-	-	-	-	-	-	-	-
Basidiospores	-	-	-	-	-	-	-	-
<i>Bipolaris/Dreschlera</i>	-	-	-	-	-	-	-	-
<i>Botrytis</i>	-	-	-	-	-	-	-	-
<i>Cavaria</i> (Puffball) Fruiting Body	-	-	-	-	-	-	-	-
<i>Ceratocystis/Ophiostoma</i>	-	-	-	-	-	-	-	-
<i>Chaetomium</i>	-	-	-	-	-	-	-	-
<i>Cladosporium</i>	Rare	-	Rare	Rare	Rare	-	-	Rare
<i>Curvularia</i>	-	-	-	-	-	-	-	-
<i>Epicoccum</i>	-	-	-	-	-	-	-	-
<i>Mucor</i>	-	-	-	-	-	-	-	-
<i>Myxomycetes/Periconia/Rust/Smut</i>	-	-	-	-	-	-	-	-
<i>Nigrospora</i>	-	-	-	-	-	-	-	-
<i>Penicillium</i>	-	-	-	-	-	-	-	-
<i>Petriella</i>	-	-	-	-	-	-	-	-
<i>Pithomyces</i>	-	-	-	-	-	-	-	-
<i>Stachybotrys</i>	-	-	-	-	-	-	-	-
<i>Stemphylium</i>	-	-	-	-	-	-	-	-
<i>Torula</i>	-	-	-	-	-	-	-	-
<i>Triadelphia</i>	-	-	-	-	-	-	-	-
<i>Trichoderma</i> -like	-	-	-	-	-	-	-	-
<i>Ulocladium</i>	-	-	-	-	-	-	-	-
Other hyaline spores	-	-	-	-	-	-	-	-
Other colored spores	-	-	-	-	-	-	-	-
Hyphal fragments	-	Rare	-	Rare	-	-	-	-

Data Interpretation Guideline:

- Rare** 1 to 10 spores observed on sample preparation
- Some** 11 to 30 spores observed on sample preparation
- Common** 31-60 spores observed per sample preparation
- Many** 61 to 100 spores observed per sample preparation
- Abundant** More than 100 spores observed per sample preparation
- TNTC** Too numerous to count, but no fruiting structure observed
- Colony** Abundant or numerous spores and associated fruiting structures observed
- *** Spores associated with hyphae and/or fruiting structures
- None Detected** No spore or hyphal fragment observed per sample preparation

Method ID: Aemtek SOP AF102
 Direct microscopy detection limit: one spore/hyphal fragment per sample.
 Analysis performed by: Dr. Brook Liu & Dr. Steven Huang
 Sampling Date: 02-03-2018
 Date of Analysis: 02-08-2018

Reviewed by:



Laboratory Analysis Report

Aemtek No. 1802235

Data Sheet

466 Kato Terrace
 Fremont, CA 94539
 Phone: 510-979-1979
 Fax: 510-668-1980

Project ID: 1703766
 Project Location: Bridgeport
 Analysis Performed: Fungal Direct Examination (FDE)
 Sample Type: Bulk

Submitted to:
 Exponent, Inc
 Oakland, CA 94612

Sample ID	BP-B1							
Location	BP-B1							
Sample Type	Bulk							
Fungal Identification	Characterization							
<i>Acremonium</i>	-	-	-	-	-	-	-	-
<i>Alternaria</i>	-	-	-	-	-	-	-	-
Ascospores	-	-	-	-	-	-	-	-
<i>Aspergillus</i>	-	-	-	-	-	-	-	-
<i>Aspergillus/Penicillium</i> -like	-	-	-	-	-	-	-	-
<i>Aureobasidium</i>	-	-	-	-	-	-	-	-
Basidiospores	TNTC	-	-	-	-	-	-	-
<i>Bipolaris/Dreschlera</i>	-	-	-	-	-	-	-	-
<i>Botrytis</i>	-	-	-	-	-	-	-	-
<i>Cavaria</i> (Puffball) Fruiting Body	Fruiting Body	-	-	-	-	-	-	-
<i>Ceratocystis/Ophiostoma</i>	-	-	-	-	-	-	-	-
<i>Chaetomium</i>	-	-	-	-	-	-	-	-
<i>Cladosporium</i>	-	-	-	-	-	-	-	-
<i>Curvularia</i>	-	-	-	-	-	-	-	-
<i>Epicoccum</i>	-	-	-	-	-	-	-	-
<i>Mucor</i>	-	-	-	-	-	-	-	-
<i>Myxomycetes/Periconia/Rust/Smut</i>	-	-	-	-	-	-	-	-
<i>Nigrospora</i>	-	-	-	-	-	-	-	-
<i>Penicillium</i>	-	-	-	-	-	-	-	-
<i>Petriella</i>	-	-	-	-	-	-	-	-
<i>Pithomyces</i>	-	-	-	-	-	-	-	-
<i>Stachybotrys</i>	-	-	-	-	-	-	-	-
<i>Stemphylium</i>	-	-	-	-	-	-	-	-
<i>Torula</i>	-	-	-	-	-	-	-	-
<i>Triadelphia</i>	-	-	-	-	-	-	-	-
<i>Trichoderma</i> -like	-	-	-	-	-	-	-	-
<i>Ulocladium</i>	-	-	-	-	-	-	-	-
Other hyaline spores	-	-	-	-	-	-	-	-
Other colored spores	-	-	-	-	-	-	-	-
Hyphal fragments	TNTC	-	-	-	-	-	-	-

Data Interpretation Guideline:

- Rare** 1 to 10 spores observed on sample preparation
- Some** 11 to 30 spores observed on sample preparation
- Common** 31-60 spores observed per sample preparation
- Many** 61 to 100 spores observed per sample preparation
- Abundant** More than 100 spores observed per sample preparation
- TNTC** Too numerous to count, but no fruiting structure observed
- Colony** Abundant or numerous spores and associated fruiting structures observed
- *** Spores associated with hyphae and/or fruiting structures
- None Detected** No spore or hyphal fragment observed per sample preparation

Method ID: Aemtek SOP AF102
 Direct microscopy detection limit: one spore/hyphal fragment per sample.
 Analysis performed by: Dr. Brook Liu & Dr. Steven Huang
 Sampling Date: 02-03-2018
 Date of Analysis: 02-08-2018

Reviewed by:

CHAIN OF CUSTODY RECORD/SAMPLE ANALYSIS REQUEST FORM

Project Name / Number: 1703766/Bridgeport **Sampling Date:** 2/3/2018

Ship To: Aemtek
466 Kato Terrace
Fremont, CA

Lab Contact: Sharon Spencer
Phone: (510) 979-1979
E-mail: _____

SAMPLERS: M. Posson

Exponent Contact: Mike Posson
Direct Phone: 510-268-5077
Email: mposson@exponent.com

Office Location:
 Farmington Hills, MI (248) 324-9100
 Menlo Park, CA (650) 326-9400
 Oakland, CA (510) 268-5000
 Other: _____

Sample No.	Time	Vol(L)	Fungi: Spore Trap Analysis	Fungi: Direct Microscopic Exam	Culturable Fungi: Std. Quant. Analysis	Fungi: w/Pen. and Asp. Speciation	Matrix	Area	Remarks / Sample Location
BP-OA1-	1340	75	X				ST	N/A	
BP-OA2-	1340								
BP-OA3-	1359								
BP-E2-1-	1410								
BP-E2-2-	1416								
BP-E3-1-	1425								
BP-E4-2-	1431								
BP-D2-1-	1442								
BP-D2-2-	1450								
BP-D3-1-	1501								
BP-D3-2-	1510								
BP-OA4-	1523								
BP-OA5-	1535								
BP-OA6-	1548								
BP-A9-1-	1602								
BP-A9-2-	1608								

MATRIX CODE: BC = Biocassette ST = Spore Trap
 B = Bulk T = Tape
 D = Dust SW = Swab
 OTHER: please identify code: _____

PRIORITY: Standard Rush Next Day 2-Day Same Day (Extra Fee)
 Due Date: _____

Shipped Via: FedEx UPS Courier Hand Other: _____

Condition of Samples Upon Receipt: _____

Custody Seal Intact: Yes No None

Relinquished by: Mike Posson **Date/Time:** 2/5/2018 @ 12:35 **Received by:** Thomas/Giana **Date/Time:** 2/6/18 10:30am

Relinquished by: _____ **Date/Time:** _____ **Received by:** _____ **Date/Time:** _____

