Limited Indoor Air Quality Assessment and Sampling Report

John Pettibone Community Center
2 Pickett District Road, New Milford, CT

Town of New Milford

New Milford, CT

January 31, 2018

Fuss & O'Neill EnviroScience, LLC
146 Hartford Road
Manchester, CT 06040

Project No. 20171128.A1E

FUSS & O'NEILL
EnviroScience, LLC

January 30, 2017

Mr. Michael Crespan
Health Director
Town of New Milford
10 Main Street
New Milford, CT 06776

RE: Limited Indoor Air Quality Assessment & Sampling Report
John Pettibone Community Center
2 Pickett District Road, New Milford, CT
Fuss & O'Neill EnviroScience No. 20171128.A1E

Dear Mr. Crespan:

Enclosed please find the report for the limited indoor air quality assessment and sampling conducted at the John Pettibone Community Center located at 2 Pickett District Road in New Milford, Connecticut (the "Site").

The services were performed on January 11, 2018 by a Fuss & O'Neill EnviroScience, LLC representative and included a limited air quality assessment and bio-aerosol air sampling for the presence of fungi. The work was performed in accordance with our written agreement dated December 11, 2017.

If you have any questions regarding the enclosed report, please do not hesitate to contact me at (860) 646-2469, extension 5333. Thank you for this opportunity to have served your environmental needs.

Sincerely,

Jared D. Smith, CSP
Project Manager

JDS/kr

Enclosure

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Appendices **End of Report**

1 Introduction and Background

Fuss & O'Neill EnviroScience, LLC (EnviroScience) was retained to conduct a limited indoor air quality (IAQ) assessment and sampling at the John Pettibone Community Center located at 2 Pickett District Road in New Milford, Connecticut (the "Site"). The purpose of this assessment was to provide data regarding a potential IAQ concern at the Site related to numerous roof leaks and a "creosote type odor" reported in one area of the building. The work was conducted for the Town of New Milford, Connecticut (the "Client") in accordance with our written agreement dated December 11, 2017 and is subject to the limitations included in *Appendix A*.

EnviroScience's Technician, Mr. Scott Mossey, conducted the assessment and sampling on January11, 2018.

1.1 Scope of Work

The scope of work included moisture, visual and olfactory assessments of the Site building where IAQ concerns were reported (as identified by the Client) as well as other representative areas of the building and mechanical spaces. The assessment also included real-time measurements for typical IAQ indicators and comparison to recognized guidelines. Additionally, a general overview of the various types and designs of the heating, ventilation, and air conditioning (HVAC) systems present in the building was conducted to identify potential problems and/or concerns as they relate to IAQ. Access to the roof mounted HVAC equipment was not available at the time of the assessment due to snow cover and a blocked access door.

2 Building and Mechanical System Description

Based on information provided by the Client and EnviroScience's historical knowledge of the Site, we understand the Site was used as an Elementary School until 2015 at which time, the building was transferred to the Client and sat vacant and unused for approximately a year. Within the last 6 months, the Site was subject to a few minor upgrades and was put back into use as the Town of New Milford's Community Center. The building currently houses a number of programs including, but not limited to, Parks and Recreation, Youth Services, and New Milford Food Bank.

The Town of New Milford Assessor's Office identifies the Site building as being originally constructed in 1955 and, based on the construction of the building and notes on a Client provided floor plan, it appears a large addition was added around 1965 with multiple minor renovations occurring since that time. The building roof was observed to be a rubber membrane and a typical built-up roof is likely present below.

The building is heated with two oil fired boilers providing steam to perimeter heating units throughout the building. Pipe tunnels carry the piping from the sub-grade mechanical room to the various building wings. The building was originally designed with multiple exhaust fans in each wing (each serving up to three classrooms) to control the amount of fresh air being drawn into the building. Certain areas of the building are served by separate HVAC systems of various designs and capacities that were added at a later date.

3 Scope of Testing and Methodology

Test parameters included measurement of temperature, relative humidity (RH), carbon monoxide (CO), carbon dioxide (CO_2), and Total Volatile Organic Compounds (TVOCs).

Measurements were obtained using a calibrated portable TSI IAQ-Calc IAQ meter, Model 7545X, a calibrated portable Ion Science Tiger Photoionization Detector (PID), and a Delmhorst Moisture Meter, Model BD-10.

In addition to real-time measurements, EnviroScience performed bio-aerosol air sampling and surface sampling for the presence of fungi and submitted the collected samples to EMSL Analytical Inc. for laboratory analysis. Refer to *Appendix C* for a complete instrumentation list and corresponding calibration information used in conducting this assessment.

3.1 Temperature and Relative Humidity

Temperature and relative humidity levels are indicators of thermal comfort. The American Society of Heating, Refrigerating, and Air Conditioning Engineers (ASHRAE) recommends that wintertime indoor temperature be maintained between 68°F and 74°F and summertime indoor temperature be maintained between 73°F and 79°F. ASHRAE also recommends that humidity be maintained in the range of 30% to 60%. Humidity below this range may cause stress through the drying of mucous membranes and skin. Humidity above this range may promote the growth of fungi spores with resultant contamination of the building and/or ventilation system.

According to its Standard 55-2017, Thermal Environmental Conditions for Human Occupancy, ASHRAE has defined the operative temperature (68°F to 79°F) as that temperature range at which at least 80% of the sedentary or near sedentary occupants will find the environment thermally acceptable.

3.2 Carbon Dioxide (CO_2)

Carbon dioxide (CO_2) is a product of human respiration. CO_2 concentrations in a building are used as a primary indicator of outside air exchange. CO_2 at very high concentrations (e.g., greater than 5,000 parts per million [ppm]) can pose a health risk. However, in most buildings, concentrations rarely rise to these levels and CO_2 at the concentrations commonly identified in buildings is not a direct health risk. At the activity levels in typical office buildings, steady CO_2 concentrations of about 700 ppm above outdoor air measurements indicate an outdoor air ventilation rate of about 15 cubic feet per minute (cfm) per person. CO_2 concentrations in outdoor air typically range from 300 to 500 ppm.

ASHRAE Standard 62.1-2016, Ventilation for Acceptable Indoor Air Quality, suggests an indoor CO_2 concentration of up to 1,000 to 1,200 ppm in spaces housing sedentary people is acceptable and an indicator of adequate outside air exchange.

3.3 Carbon Monoxide (CO)

Carbon monoxide (CO) is a colorless and odorless toxic gas that most often occurs as a by-product of incomplete hydrocarbon fuel combustion. The most likely sources of CO are from incomplete hydrocarbon fuel combustion inside a building, and from air intakes placed in, at, or near parking garages or street level that may entrain automotive exhaust gases into the air handling system. Back drafts from boiler flues may also provide a pathway for CO infiltration. In absence of any formal IAQ standard, EnviroScience uses the more conservative National Ambient Air Quality Standard (NAAQS) of 9 ppm for CO. The Occupational Safety and Health Administration (OSHA) Permissible Exposure Limit (PEL) for carbon monoxide is 50 ppm, as an eight-hour time-weighted-average (8-hr. TWA).

3.4 Total Volatile Organic Compound (TVOC) Screening

Total volatile organic compounds (TVOCs) are emitted as gases from certain solids or liquids. TVOCs include a variety of chemicals, some that may have short and/or long-term adverse health effects. Concentrations of many TVOCs are consistently higher indoors when compared to outdoor measurements. TVOCs are emitted by a wide array of products, numbering in the thousands. Some examples include:

- paints and lacquers;
- paint strippers;
- cleaning supplies;
- pesticides;
- building materials and furnishings;
- office equipment such as copiers and printers;
- correction fluids and carbonless copy paper;
- graphics and craft materials including glues and adhesives;
- permanent markers; and
- Photographic solutions.

The ability of organic chemicals to cause health effects varies greatly from those that are highly toxic, to those with no known health effects. As with other pollutants, the extent and nature of the health effect depends on many factors, including but not limited to the exposure duration and concentration ("time/dose"). Eye and respiratory tract irritation, headaches, dizziness, visual disorders, and memory impairment are among the most common symptoms that some people have experienced.

To date, no standards have been established for TVOCs exposure in non-industrial settings. However, exposures to specific TVOCs, such as formaldehyde, have been regulated by governmental agencies. For example, OSHA regulates formaldehyde as a carcinogen.

3.5 Bio-Aerosol (Quantitative Spore Count) Air Sampling

3.5.1 Introduction

Air-dispersed fungal particles are common in indoor and outdoor environments. The particles can include spores (air-disseminated "seeds" of fungi), yeasts, and other particles. The particles of many fungi can produce allergic reactions in susceptible members of the population.

The possible sources for the growth of fungi are varied and numerous, including stagnant water, water-soaked building materials (i.e., ceiling tiles, drywall, carpets, etc.), soiled ducting and filters in air handling units, and plants and landscaping inside a building.

3.5.2 Air Sampling

Air samples are collected for Quantitative Spore Count (QSC) analysis, representing concentrations of both viable and non-viable spores, as the latter can also have an influence on occupants as well as viable spores.

For the purposes of this assessment, a total of 13 interior air samples were collected from occupied and unoccupied areas of the building. In addition to the interior samples, two air samples (pre-assessment and post-assessment) were collected from an exterior location to provide ambient data. The ambient air samples were collected as controls for the type and amount of particulate gathered in the interior samples. It is important to note that, at the time of the assessment, there was significant snow cover which may reduce ambient mold concentration compared to what might be expected for samples collected at a time when snow cover is not present.

3.5.3 Quantitative Spore Count Method

Air samples are collected on Air-O-Cell™ brand cassettes at 15.0 liters per minute (lpm) for ten minutes each. Vacuum is provided by a Buck BioAir Sampling pump specific for bio-aerosol sampling and calibrated on site with the associated calibrated rotometer. Particulate impacted onto the adhesive strip in the cassette is visually examined by microscope by a properly trained analyst to determine the quantitative spore count of the sample.

3.5.4 Interpretation of Results

Molds are ubiquitous in the environment. As such, there are no regulatory standards regarding exposures to mold spores or even consistent guidelines for interpreting indoor mold concentrations. Most industry sources agree that it is not possible to recommend limits for mold concentrations due to the lack of data from which the concentrations can be linked to the onset of disease. Also, airborne mold concentrations may change according to spatial and temporal variations. Numerical standards and guidelines for mold; therefore, are not likely to be available in the near future.

Without standards and guidelines, the current approach to interpretation of results of mold samples relies on comparison of indoor vs. outdoor results and complaint vs. non-complaint area results. In general, indoor airborne mold counts should be significantly lower than those on a building exterior. Airborne mold counts in non-complaint areas should be significantly lower than those in complaint areas. In addition, the genus/species identified indoors should be similar to those identified in exterior samples. However, this may not always be consistent. Occupied buildings with many entrances and operable windows may have indoor mold airborne concentrations higher than or as high as those from the exterior. Also, the concentrations of exterior mold genus/species are likely to be lower on a cold or rainy day compared to the expected concentrations on a warm, sunny day when the spores may be abundant. A situation may be considered unusual when the airborne mold concentrations in the indoor/complaint area are significantly higher than those in the exterior/non-complaint area. Interpretation of these results requires considerable professional judgment.

3.6 Surface (Swab) Sampling

Two swab samples were collected from surfaces where suspect mold growth was observed. At the time of the assessment, suspect mold growth was observed in a pipe tunnel where a visual assessment was performed (not all pipe tunnels were accessed) and on HVAC supply diffusers/return grates. A swab sample was collected from each of the previously mentioned surfaces.

Swab samples are collected using HealthLink sterile transporter swabs from an approximate two square-inch collection area. Swab samples are then analyzed by direct microscopic examination for spores and growth to determine a quantitative spore count per area of the sample. Like the air sampling method described above, direct examination identifies mold spores, but does not differentiate between viable and non-viable mold spores. Non-viable spores can be of interest with respect to health, as can viable spores.

3.7 Moisture Meter Testing

Moisture measurements were obtained using a Delmhorst Moisture Meter. Measurements were collected in various locations during the assessment to determine if there was moisture present, which may be an indicator of an active water intrusion.

4 Observations

On the day of the assessment, January 11, 2018, the weather was partly cloudy with seasonably warm conditions. Snowfall had occurred approximately a week prior to the assessment and significant snow cover was present at the time of the assessment.

Mr. Scott Mossey performed a visual and olfactory assessment in representative areas of the building noted below:

- Facilities Office
  - Obvious visible suspect mold not present
  - Mold or mildew odor not present

- Limited water staining was observed on ceiling tiles at a ceiling penetration associated with HVAC equipment
- Delaminated surfaces were not observed
- Elevated moisture measurements not observed

- Cafeteria
  - Obvious visible suspect mold not present
  - Mold or mildew odor not present
  - Water staining was not observed
  - Delaminated surfaces were not observed
  - Elevated moisture measurements not observed

- Gymnasium
  - Obvious visible suspect mold not present
  - Slight musty odor present
  - Water staining was not observed
  - Delaminated surfaces not observed
  - Exhaust ventilation system in penthouse area adjacent to stage not operating
  - Elevated moisture measurements not observed

- Music (Room #31)
  - Obvious visible suspect mold not present
  - Mold or mildew odor not present
  - Limited water staining observed to Tectum ceiling deck (~4 SF)
  - Delaminated surfaces not observed
  - Elevated moisture measurements not observed

- Office (Room #1) Parks and Recreation Office
  - Suspect mold observed at ceiling mounted HVAC diffuser
    - Swab sample collected
  - Mold or mildew odor not present
  - Observed limited water staining to suspended ceiling tile system
    - Some tiles appear to have been replaced from other areas of the building
  - Delaminated surfaces were not observed
  - Elevated moisture measurements not observed
  - Room serviced by separate HVAC unit
  - Two portable heaters in use at the time of the assessment
  - Two live plants present

- Computer Lab (Room #2)
  - Obvious visible suspect mold not present
  - Mold or mildew odor not present
  - Observed limited water staining to gypsum wallboard wall at air conditioning unit penetrations
    - Staining appears to be related to condensation
  - Delaminated surfaces were not observed

- Elevated moisture measurements not observed
- Exhaust vent observed to be active
    - Accumulation of dust observed

- Room #8
    - Obvious visible suspect mold not present
    - Mold or mildew odor not present
    - Observed limited water staining to suspended ceiling tile system
    - Limited staining observed on carpeting
    - Delaminated surfaces not observed
    - Elevated moisture measurements not observed

- Hallway Connector (Between Room #8 -11)
    - Obvious visible suspect mold not present
    - Mold or mildew odor not present
    - Creosote odor present
        - Assumed creosote treated wood observed at perimeter areas of hallway and overhangs
        - Direct access above ceiling not available due to metal panel ceiling design
    - Water staining was not observed
    - Heavy staining observed on carpeting
    - Delaminated surfaces were not observed
    - Elevated moisture measurements not observed

- Room #11
    - Obvious visible suspect mold not present
    - Mold or mildew odor not present
    - Creosote odor present
        - Assumed creosote treated wood observed above perimeter windows
    - Observed limited water staining to suspended ceiling tile system
    - Heavy staining observed on carpeting
    - Elevated moisture measurements not observed

- Room #18
    - Suspect mold growth observed on fiberglass pipe insulation within pipe tunnel
        - Swab sample collected in crawl space
    - Mold or mildew odor not present
    - Creosote odor present
        - Assumed creosote treated wood observed above perimeter windows
    - Limited water staining observed to suspended ceiling tile system
        - Many ceiling tiles previously removed
    - Heavy staining observed on carpeting
    - Elevated moisture measurements not observed

- Youth Agency (Room #22)
    - Obvious visible suspect mold not present

- Mold or mildew odor not present
- Observed water staining to 1' x 1' ceiling tile system (~12 SF)
- Delaminated surfaces were not observed
- Elevated moisture measurements not observed

- Store Room (Room #25)
  - Obvious visible suspect mold not present
  - Mold or mildew odor not present
  - Water staining not observed
  - Delaminated surfaces were not observed
  - Elevated moisture measurements not observed

- Boiler Room (subgrade)
  - Obvious visible suspect mold not present
  - Mold or mildew odor not present
  - Sweet/soil odor observed when access points to pipe tunnels were opened.
    - This may indicate a leak in the heating system
  - Significant evidence of water intrusion into boiler room foundation
    - Staining/rust observed on floor
    - Client represent indicated a high water table
    - Sump pit present
  - One boiler partially disassembled and not operating at the time of the assessment

- Room #34
  - Obvious visible suspect mold not present
  - Mold or mildew odor not present
  - Water staining not observed
  - Limited staining observed on carpeting
  - Delaminated surfaces were not observed
  - Elevated moisture measurements not observed

- Social Services (Room #39)
  - Obvious visible suspect mold not present
  - Mold or mildew odor not present
  - Water staining not observed
  - Delaminated surfaces were not observed
  - Elevated moisture measurements not observed

5 Results

5.1 Temperature and Relative Humidity

At the time of the assessment, interior temperature measurements ranged from 60.3°F to 75.8°F. The temperature measurements recorded in areas of the building that were actively in use were within the

ASHRAE recommended wintertime range of between 68°F and 74°F or slightly below. Other areas in the building that were not in use or not considered an occupied space such as the cafeteria, gymnasium, hallway connector, and Room #11 were noted to be below the recommend range

At the time of the assessment, interior relative humidity measurements ranged from 18.9% to 37.9%. The majority of the relative humidity measurements were below the ASHRAE recommended range of 30 to 60%. This can likely be attributed to seasonably low ambient humidity.

Outdoor ambient temperatures ranged from 43.0°F to 43.2°F and outdoor relative humidity measurements ranged from 60.4% to 69.8%.

Refer to *Appendix D* for the data sheet for temperature, relative humidity, carbon dioxide, carbon monoxide, and TVOCs.

5.2 Carbon Dioxide

Interior concentrations of carbon dioxide ranged from 493 ppm to 1,234 ppm during the assessment period. These measurements were within the ASHRAE recommended range with the exception of the measurement recorded in the Social Services Room (Room #39) at 1,234 ppm. This room was occupied at the time of the assessment.

5.3 Carbon Monoxide

Within the limitation of instrumental accuracy, there was no carbon monoxide detected in the building during this assessment.

5.4 Total Volatile Organic Compound (TVOC) Screening

Measurements of VOCs were collected using a portable Photoionization Detector (PID). A PID indicates if TVOCs are present, but the instrument does not identify the type of compound.

A creosote odor was identified in the addition at the south end of the school however, at the time of the assessment; no interior measurements of TVOCs were recorded in the building. These measurements were similar to ambient measurements collected prior to and at the completion of the assessment. This indicates at the time of the assessment elevated concentrations of TVOCs were not detected within the representative areas of building included in this assessment.

A visual and olfactory assessment in the south wing of the building identified the presence of what appeared to be creosote-treated wood used as filler material above windows, doors and other penetrations along the exterior of the building.

The Agency for Toxic Substances and Disease Registry (ATSDR) issued a Public Health Statement in 2002 with information and the effects of exposure to creosote. A copy of the ATSDR document is included in *Appendix E*. Should the Client elect to reuse the south wing of the building, EnviroScience

recommends additional evaluation of the space which may include air sampling specific to components of creosote (e. g. coal tar).

5.5 Bio-Aerosol (Quantitative Spore Count) Air Sampling

Air sampling for Quantitative Spore Count (QSC) was conducted on January 11, 2017. The QSC in the ambient air samples ranged from 440 Count/m^3 (pre-assessment sample) to 180 Count/m^3 (post-assessment sample). The QSC in the interior air samples ranged from 80 Count/m^3 to 914 Count/m^3.

Results for the indoor air samples in the majority of the areas sampled showed no concentrations of concern. In most areas, the interior samples showed species similar to those exhibited in the exterior samples and were present in concentrations similar or less than those exhibited in the exterior samples when comparing the "raw counts" in the laboratory report. Species identified in the indoor air samples that were not identified in the exterior samples were present at low concentrations and are not considered to be a concern at this time with the exception of the specific locations listed below.

While the Client has been proactive with the removal/replacement of water damage building materials, water damage was observed in many areas of the building, specifically impacts to ceiling tiles. As may be expected, concentrations of fungi spore types associated with water damaged building materials were identified in the building.

The air sample collected in Social Services (Room #39) displayed a slightly elevated concentration of the spore type *Aspergillus/Penicillium* at a concentration roughly 3.5 times that of the exterior sample raw count. The observed results are likely associated with a roof leak in this location however, no active moisture sources were observed in this location at the time of the assessment. *Aspergillus* is commonly identified in the indoor environment on organic materials subject to elevated humidity and/or water damage. *Penicillium* is also a common indoor contaminant noted on water damaged cellulose, fibers and carpets. Both spore types are commonly found in the outdoor environment in soil.

The air sample collected in Facilities Office displayed a concentration of the spore type *Stachybotrys*. This spore type was not identified in the exterior ambient samples. *Stachybotrys* (commonly referred to as black mold) is slow growing as compared to *Penicillium* and other common mold genera, and may not compete well in the presence of other fungi. However, when water availability is high for prolonged periods on environmental material, these spore types may gradually become the predominating mold, especially on cellulose containing materials. The source of this spore type may be associated with the water damage that was observed on the ceiling tile in this area or, being that this is the Facilities Office; spores may have been tracked in from other areas of the building such as the boiler room where water intrusions are common.

Refer to *Appendix F* for the Quantitative Spore Count laboratory report and chain of custody form.

5.6 Surface (Swab) Sampling

Two surface samples were collected where suspect mold growth was identified at the time of the assessment. Once sample was collected in the Park and Recreation Office from the surface of the vent diffuser and one sample was collected from the surface of pipe insulation within a pipe tunnel in the south wing accessed from Room 18.

The result of the swab sample collected from the surface of the vent identified a rare concentration of the spore type *Basidiospores* and a high concentration of the yeast. The spore types are relatively benign and EnviroScience recommends cleaning the vents in this location and any other areas of the building where HVAC diffusers are present.

The results of the swab sample collected from the surface of the pipe insulation in the pipe tunnel displayed the presence of nine different spore types. Visual assessment of the pipe tunnel displayed drip marks on the ceiling and floors indicating a condensation issue within the pipe tunnel which likely provided the moisture to support mold growth. This is an unoccupied area however; any work that may impact pipe insulation in this area should be performed with appropriate engineering controls by properly trained individuals.

Refer to *Appendix G* for the Direct Microscopic Examination laboratory report and chain of custody form.

5.7 Moisture Meter Testing

Minimal moisture concentrations were detected in the areas of the building included in this assessment however, not all areas were included. Based on information provided by the Client, a significant amount of roof leaks (~60 to 70 locations) have occurred in the building. No obvious active roof leaks were observed at the time of the assessment.

6 Conclusions and Recommendations

Based on the measurements, physical walk-through, and information available at the time of this assessment, EnviroScience concludes and recommends the following:

6.1 Conclusions

- Interior temperature measurements recorded in areas of the building that were actively in use were within the ASHRAE recommended wintertime range of between 68°F and 74°F or slightly below.
    - Other areas in the building that were not in use such as the cafeteria, gymnasium, hallway connector, and Room #11 were noted to be below the recommend range.

- All recorded interior relative humidity measurements were below the ASHRAE recommended range of 30 to 60%.

- This can likely be attributed to seasonably low ambient humidity.

- Interior carbon dioxide within the ASHRAE recommended range with the exception of the measurement recorded in the Social Services Room (Room #39).
  - Room #39 was occupied at the time of the assessment.

- Interior carbon monoxide concentrations were below levels specified by the NAAQS.

- A creosote odor was identified in the addition at the south wing of the school however, at the time of the assessment; no interior measurements of TVOCs were recorded in the building.
  - A visual and olfactory assessment in the south wing of the building identified the presence of what appeared to be creosote-treated wood used as filler material above windows, doors and other penetrations along the exterior of the building.

- Results for the indoor air samples in the majority of the areas sampled showed no concentrations of concern with exception to the specific locations listed below:
  - In most areas, the interior samples showed species similar to those exhibited in the exterior samples and were present in concentrations similar or less than those exhibited in the exterior samples.
  - Species identified in the indoor air samples that were not identified in the exterior samples were present at low concentrations and are not considered to be a concern at this time.

- The air sample collected in Social Services (Room #39) displayed a slightly elevated concentration of the spore type *Aspergillus/Penicillium* at a concentration roughly 3.5 times that of the exterior sample raw count.
  - The observed results are likely associated with a roof leak in this location however, no active moisture sources were observed in this location at the time of the assessment.

- The air sample collected in Facilities Office displayed a concentration of the spore type *Stachybotrys*. This spore type was not identified in the exterior ambient samples.
  - The source of this spore type may be associated with the water damage that was observed on the ceiling tile in this area or, being that this is the Facilities Office; spores may have been tracked in from other areas of the building such as the boiler room where water intrusions are common.

- Two surface samples were collected where suspect mold growth was identified at the time of the assessment. Once sample was collected in the Park and Recreation Office from the surface of the vent diffuser and one sample was collected from the surface of pipe insulation within a pipe tunnel in the south wing accessed from (Room 18).
  - The result of the swab sample collected from the surface of the vent identified a rare concentration of the spore type *Basidiospores* and a high concentration of the yeast.
  - The results of the swab sample collected from the surface of the pipe insulation in the pipe tunnel displayed the presence of nine different spore types to be present. Visual assessment of the pipe tunnel displayed drip marks on the ceiling and floors indicating a

condensation issue within the pipe tunnel which likely provided the moisture to support mold growth.

- Minimal moisture concentrations were detected in the areas of the building included in this assessment however, not all areas were included. Based on information provided by the Client, a significant amount of roof leaks (~60 to 70 locations) have occurred in the building. No obvious active roof leaks were observed to be active at the time of the assessment.

6.2 Recommendations

- Review all air handing equipment and exhaust equipment in the building to confirm proper operation and that the equipment is being maintained at appropriate intervals.
  - Clean HVAC diffusers in the building at regular intervals to avoid the accumulation of dust and debris which may support mold growth.
  - It was noted during the assessment that not all exhaust fans were in use for varying reasons. The slightly elevated concentration of carbon dioxide in the Social Services office may be attributed to a non-functioning exhaust fan in this location.

- Identify the potential source of moisture in the Social Services office and the facilities office and correct. Continue responding to roof leaks or other moisture intrusions to control the source of the moisture and remove moisture impacted building materials.
  - Remediation of mold impacted building materials should be performed using appropriate engineering controls by properly trained individuals.
  - An asbestos inspection is required prior to impacts to materials that have not been sample and determined to be non-asbestos.

- Evaluate the need to use the south wing of the building and perform additional evaluation of the space which may include air sampling specific to components of creosote (e. g. coal tar).

- Assume all pipe insulation within pipe tunnels to be mold contaminated. Impacts to pipe insulation should be performed using appropriate engineering controls by properly trained individuals.

Refer to *Appendix H* for photographs taken during the assessment.

Report prepared by:

Jared D. Smith, CSP
Project Manager

Reviewed by:

Kathleen C. Pane
Senior Project Manager

Appendix A

Limitations

FUSS & O'NEILL
EnviroScience, LLC

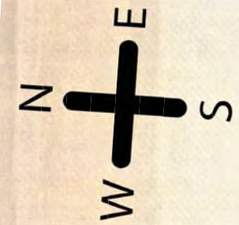
APPENDIX A

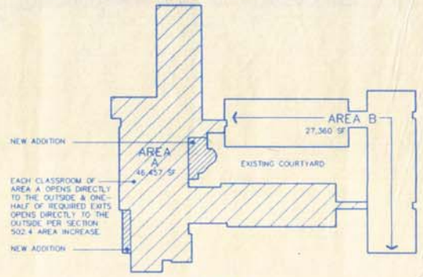
Site:
John Pettibone Community Center
2 Pickett District Road
New Milford, CT

1. This environmental report has been prepared for the exclusive use of the Town of New Milford (the "Client"), and is subject to, and is issued in connection with our written agreement on December 11, 2017. Any use or reliance upon information provided in this report, without the specific written authorization of the Client and Fuss & O'Neill EnviroScience, LLC, (EnviroScience) shall be at the User's individual risk.
2. EnviroScience has obtained and relied upon information from multiple sources to form certain conclusions regarding the Site when conducting this assessment. Except as otherwise noted, no attempt has been made to verify the accuracy or completeness of such information or verify compliance by any party with federal, state or local laws or regulations.
3. EnviroScience has obtained and relied upon laboratory analytical results in conducting the sampling. This information was used to form conclusions regarding the types and quantities of bio-aerosols and mold at the Site. EnviroScience has not performed an independent review of the reliability of this laboratory data.
4. The findings, observations and conclusions presented in this report are limited by the scope of services outlined in our Agreement dated December 11, 2017, which reflects schedule and budgetary constraints imposed by Client. Furthermore, the assessment has been conducted in accordance with generally accepted environmental practices. No other warranty, expressed or implied, is made.
5. The conclusions presented in this report are based solely upon information gathered by EnviroScience to date. Should further environmental or other relevant information be discovered at a later date, the Client should immediately bring the information to EnviroScience's attention. Based upon an evaluation and assessment of relevant information, EnviroScience may modify this report and its conclusions.

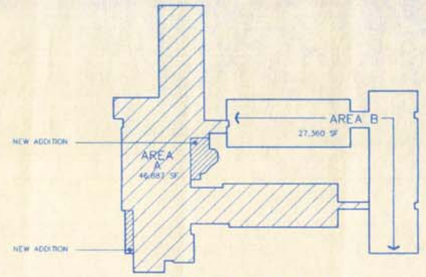
Appendix B

Site Diagram





FIRE AREAS
SCALE 1"=80'-0"



SMOKE COMPARTMENT AREAS
SCALE 1"=80'-0"

AREA A EXCEPTION 1 OF NFPA 11-3.7.1 ALLOWS AREA GREATER THAN 30,000 SF WHEN ALL CLASSROOMS HAVE EXTERIOR EXIT ACCESS IN ACCORDANCE WITH 5-5.3.

AREA B + C = 28,373 SF < 30,000 SF

NOTE:
DOORS AT SMOKE BARRIERS ARE ON MAGNETIC HOLD-OPENS TIED TO FIRE ALARM SYSTEM.

BUILDING AREAS

AREA LIMITATIONS FOR EDUCATION OCCUPANCY

2C CONSTRUCTION FROM TABLE 501 ALLOWS 14,400 SF

AREA A		AREA B	
TOTAL ALLOWABLE AREA FOR A AREA INCREASES FOR STREET FRONTAGE FROM 502.2 FOR AREA A	14,400 SF	TOTAL ALLOWABLE FOR B AREA INCREASES FOR STREET FRONTAGE FROM 502.2 FOR AREA B	14,400 SF
PERIMETER OF AREA A = 1507' PERIMETER AT COURTYARD (NON STREET FRONTAGE) 375 = 75% OPEN		PERIMETER OF AREA B = 1090' PERIMETER AT COURTYARD (NON STREET FRONTAGE) 382' = 65% OPEN	
SUBTRACTING 25% FROM 75% = 50% AND INCREASING 2% FOR EACH 1% OF FRONTAGE = 100% INCREASE OR AN ADDITIONAL 14,400 SF	14,400 SF	SUBTRACTING 25% FROM 65% = 40% AND INCREASING 2% FOR EACH 1% OF FRONTAGE = 80% INCREASE OR AN ADDITIONAL 11,520 SF	11,520 SF
AREA INCREASE FOR ONE STORY SCHOOL BUILDINGS WITH DIRECT EXIT FROM EACH CLASSROOM OPENING DIRECTLY TO THE OUTSIDE AND ONE-HALF OF THE REQUIRED EXITS DISCHARGING TO THE OUTSIDE PER 502.4 = 200% INCREASE	28,800 SF	TOTAL ALLOWABLE FOR AREA B ACTUAL	25,920 SF 27,360 SF
TOTAL ALLOWABLE FOR AREA A ACTUAL	57,600 SF 46,457 SF		

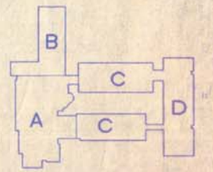
LEGEND

- 0 — MAXIMUM ALLOWABLE OCCUPANCY
- 0 / 165 — ACTUAL EGRESS OCCUPANCY / MAXIMUM ALLOWABLE EGRESS OCCUPANCY
- (----) MAXIMUM TRAVEL DISTANCE (AT MOST REMOTE CORNER)
- (100) ROOM NUMBER
- H.C. HANDICAPPED ACCESSABLE SPACES

Air Sample -14
Air Sample -05
Air Sample -13
Exercise Room
Surface Sample -2
Yellow highlight indicates area of building with prominent Creosote odor
Air Sample -12
Air Sample -04
Air Sample -06, Surface Sample -01
Air Sample -08
Air Sample -09
Air Sample -03
Air Sample -07
Facilities Office (Air Sample -02)
Air Sample -10
Exterior Ambient Air Samples (Samples -01 & -15)

NOTE: BASIC ASSUMPTION IS OCCUPANTS OF ROOMS WITH DOORS TO EXTERIOR WILL BE INSTRUCTED TO USE THEM.

IMPORTANT:
THE EXISTING CONDITIONS REPRESENTED HEREON ARE BASED ON THE CONSTRUCTION DRAWINGS, PREPARED BY LYONS & MATHER ARCHITECTS, DATED OCT. 1963 & PHILIP N. SUNDERLAND, WILLIAM WEBB SUNDERLAND ARCHITECTS, DATED DEC. 1957 AND ARE INCLUDED FOR THE CONTRACTORS REFERENCE ONLY. FLETCHER-THOMPSON CANNOT GUARANTEE THE CORRECTNESS OF THE EXISTING CONDITIONS SHOWN AND ASSUMES NO RESPONSIBILITY THEREFOR. INCLUSION OF THESE EXISTING CONDITIONS HEREON SHALL IN NO WAY ALLEVIATE THE CONTRACTOR OF ITS RESPONSIBILITY TO VISIT THE SITE AND TO VERIFY ALL EXISTING CONDITIONS.



KEY PLAN
N.T.S.

No.	Date	Rev.	By

State Project No. 096 - 88 - 025EA

FLETCHER THOMPSON
ARCHITECTURE/ENGINEERING/INTERIOR DESIGN
FLETCHER-THOMPSON, INC.
TWO WORLD TRADE PLAZA / BRIDGEPORT, CT 06604-3944 / 203 366 5441 / FAX 367 3540
111 CHESTER OAK AVENUE / HARTFORD, CT 06106-1912 / 203 249 9566 / FAX 549 0218

Proj. Mgr.	Proj. Designer	Proj. Arch/Eng.	Drawn by
C.A. SALIT	J. SELLS	P.J. VISENTIN	T.K. HOFMANN

Project: ADDITIONS AND RENOVATIONS
PETTIBONE ELEMENTARY SCHOOL
NEW MILFORD, CONNECTICUT

Drawing Title: OVERALL FLOOR PLAN

Date: NOV. 2, 1990
Scale: 1/16"=1'-0"
Drawing No.: 10 2
Contract No.: 42843.06

Appendix C

List of Instrumentation

FUSS & O'NEILL
EnviroScience, LLC

Instrumentation

Measurement Parameter	Description	Calibration
Temperature, Relative Humidity, Carbon Dioxide & Carbon Monoxide	TSI IAQ-Calc IAQ Meter (7545X)	Annually – 2017
Volatile Organic Compounds	Ion Science Tiger photoionization detector	Annually – 2017
Bioaerosol Air Sampling	AP Buck BioAir Sampling Pump with Air-O-Cell™ Cassettes	Rotometer # R12143
Moisture Content on/in Building Materials	Delmhorst Moisture Meter	Factory

FUSS & O'NEILL
EnviroScience, LLC

Appendix D

Data Sheet for Temperature, Relative Humidity, Carbon Dioxide, Carbon Monoxide, and Particulates

FUSS & O'NEILL
EnviroScience, LLC

Air Quality Parameters

CLIENT: Town of New Milford

SITE ADDRESS: 2 Pickett District Road

CITY & STATE: New Milford, CT

FUSS & O'NEILL ENVIROSCIENCE PROJECT NO. 20171128.A1E

Date: January 11, 2018 Location: John Pettibone Community Center

Location	Time (0000)	# of Occupants	CO_2 (PPM)	CO (PPM)	Temperature (°F)	RH (%)	TVOCs (PPM)
Recommended Guidelines			**< 1,200**	**< 9.0**	**68-79**	**30-60**	**N/A**
Outdoor Ambient (Pre-Assessment)	1145	N/A	498	0.0	43.0	60.4	0.0
Facilities Office	1205	1	535	0.0	67.1	24.0	0.0
Cafeteria	1220	1	512	0.0	62.7	31.4	0.0
Gymnasium	1230	1	511	0.0	65.2	24.0	0.0
Music Room (Room #31)	1255	1	503	0.0	60.3	25.6	0.0
Office (Room #1)	1310	1	548	0.0	68.7	25.3	0.0
Computer Lab (Room #2)	1325	1	494	0.0	75.5	21.7	0.0
Room #8	1340	1	493	0.0	68.1	23.5	0.0
Hallway Connector	1355	1	592	0.0	55.0	37.9	*0.0
Copy Room	1410	N/A					*0.0
Room #11	1420	1	528	0.0	65.3	25.2	*0.0
Room #18	1430	N/A					*0.0
Youth Agency (Room #22)	1440	1	563	0.0	75.2	21.7	0.0
Storeroom (Room #25)	1500	1	553	0.0	75.8	18.9	0.0
Room # 34	1515	1	508	0.0	69.3	22.4	0.0
Social Services (Room #39)	1535	2	1234	0.0	71.0	29.0	0.0
Outdoor Ambient (Post-Assessment)	1600	N/A	513	0.0	43.2	69.8	0.0

* Indicates areas where "creosote odor" was prominent. In these locations, more stringent PID measurements were recorded at varying distances (1", 6", 12" and general room measures) from the presumed source of the odor (wood above windows).

FUSS & O'NEILL
EnviroScience, LLC

Appendix E

ATSDR Public Health Statement – Creosote

PUBLIC HEALTH STATEMENT
CREOSOTE

CAS#: Wood Creosote 8021-39-4
Coal Tar Creosote 8001-58-9
Coal Tar 8007-45-2

Division of Toxicology **September 2002**

This Public Health Statement is the summary chapter from the Toxicological Profile for Creosote. It is one in a series of Public Health Statements about hazardous substances and their health effects. A shorter version, the ToxFAQs™ is also available. This information is important because this substance may harm you. The effects of exposure to any hazardous substance depend on the dose, the duration, how you are exposed, personal traits and habits, and whether other chemicals are present. For more information, call the ATSDR Information Center at 1-888-422-8737.

This public health statement tells you about creosote and the effects of exposure.

The Environmental Protection Agency (EPA) identifies the most serious hazardous waste sites in the nation. These sites make up the National Priorities List (NPL) and are the sites targeted for long-term federal cleanup activities. Coal tar creosote, coal tar, and coal tar pitch have been found in at least 46 of the 1,613 current or former NPL sites. However, the total number of NPL sites evaluated for these substances is not known. As more sites are evaluated, the sites at which coal tar creosote, coal tar, and coal tar pitch are found may increase. This information is important because exposure to coal tar creosote, coal tar, coal tar pitch, or coal tar pitch volatiles may harm you and because these sites may be sources of exposure.

When a substance is released from a large area, such as an industrial plant, or from a container, such as a drum or bottle, it enters the environment. This release does not always lead to exposure. You are exposed to a substance only when you come in contact with it. You may be exposed by breathing, eating, or drinking the substance, or by skin contact.

If you are exposed to wood creosote, coal tar creosote, coal tar, coal tar pitch, or coal tar pitch volatiles, many factors determine whether you'll be harmed. These factors include the dose (how much), the duration (how long), and how you come in contact with them. You must also consider the other chemicals you're exposed to and your age, sex, diet, family traits, lifestyle, and state of health.

1.1 WHAT IS CREOSOTE?

Creosote is the name used for a variety of products that are mixtures of many chemicals. Wood creosotes are derived from the resin from leaves of the creosote bush (Larrea, referred to herein as creosote bush resin) and beechwood (Fagus, referred to herein as beechwood creosote). Coal tars are by-products of the carbonization of coal to produce coke or natural gas. Coal tar creosotes are distillation products of coal tar, and coal tar pitch is a residue produced during the distillation of coal tar. Coal tar pitch volatiles are compounds given off from coal tar pitch when it is heated. Coal tar creosote, coal tar, coal tar pitch, and coal tar pitch volatiles are rarely formed in nature. Coal tar creosote, coal tar, and coal tar pitch are mixtures of similar compounds. For this reason, many times throughout the profile, we will refer to coal tar creosote, coal tar, and coal tar pitch simply as creosote. Creosotes are created by high-temperature treatment of beech and other woods (beechwood creosote) or coal (coal tar creosote), or from the resin of the creosote bush (creosote bush resin).

PUBLIC HEALTH STATEMENT
CREOSOTE

CAS#: Wood Creosote 8021-39-4
Coal Tar Creosote 8001-58-9
Coal Tar 8007-45-2

Division of Toxicology **September 2002**

Wood creosote is a colorless to yellowish greasy liquid with a characteristic smoky odor and sharp burned taste. It is relatively soluble in water. Creosote prepared from coal tar is the most common form of creosote in the workplace and at hazardous waste sites in the United States. Coal tar creosote is a thick, oily liquid that is typically amber to black in color. It is easily set on fire and does not dissolve easily in water. Coal tar and coal tar pitch are the by-products of the high-temperature treatment of coal to make coke or natural gas. They are usually thick, black or dark brown liquids or semisolids with a smoky or aromatic odor. Coal tar residues can also be found in the chimneys of homes heated with coal, especially if insufficient oxygen is present. Chemicals in the coal tar pitch can be given off into the air as coal tar pitch volatiles when coal tar pitch is heated.

Beechwood creosote has been used as a disinfectant, a laxative, and a cough treatment. In the past, treatments for leprosy, pneumonia, and tuberculosis also involved eating or drinking beechwood creosote. It is rarely used today in the United States by doctors since it has been replaced by better medicines, and it is no longer produced by businesses in the United States. It is still available as an herbal remedy, and is used as an expectorant and a laxative in Japan. The major chemicals in beechwood creosote are phenol, cresols, and guaiacol.

Coal tar creosote is the most widely used wood preservative in the United States. It is also a restricted-use pesticide, so it can be used only by people who have been trained to use it safely. Coal tar products are ingredients in medicines used to treat skin diseases such as psoriasis. These products are also used as animal and bird repellents, insecticides, animal dips, and fungicides. Coal tar, coal tar pitch, and coal tar pitch volatiles are used or produced in several industries, including road paving, roofing, aluminum smelting, rubber producing, and coking. The major chemicals in coal tar creosote, coal tar, and coal tar pitch that can cause harmful health effects are polycyclic aromatic hydrocarbons (PAHs), phenol, and cresols. Coal tar pitch volatiles vary depending on the makeup of the coal tar product that is being heated. About 300 chemicals have been identified in coal tar creosote, but as many as 10,000 other chemicals may be in this mixture. Because coal tar creosote is the major type found in the environment and at hazardous waste sites in the United States, we will emphasize its effects on human health in this profile. The health effects of coal tar and coal tar pitch will also be described.

This profile is specifically about the toxicity of Creosote, so we will not discuss in detail the health effects of individual chemicals in them, such as PAHs or phenol. In the chapters describing what happens to creosote in the environment and exposure to creosote, we will discuss some of the individual chemicals or groups of chemicals (such as PAHs) because many of the tests done in the scientific laboratories can tell us which of these chemicals are present in the soil, water, and air.

The Agency for Toxic Substances and Disease Registry (ATSDR) Toxicological Profile for Polycyclic Aromatic Hydrocarbons (1995), the ATSDR Toxicological Profile for Cresols (1992), and the ATSDR Toxicological Profile for Phenol

(1998) provide more information on these chemicals.

1.2 WHAT HAPPENS TO CREOSOTE WHEN IT ENTER THE ENVIRONMENT?

No information is available on what happens to wood creosote when it enters the environment. Coal tar creosote, coal tar, coal tar pitch, and coal tar pitch volatiles do not occur in the environment naturally, but are by-products produced in coke or gas manufacturing plants using high-temperature processes. Coal tar creosote is released to water and soil mainly as a result of its use in the wood preservation industry. In the past, waste water from wood-treatment facilities was often discharged to unlined lagoons where it formed a sludge. Also, companies that preserve wood with coal tar creosote may treat their water wastes in treatment plants or release the waste water to the municipal water treatment system. This is still the largest source of coal tar creosote in the environment. However, new restrictions from EPA have caused changes in the treatment methods that have decreased the amount of creosote available to move into soil from waste water effluents. Coal tar creosote contains some components that dissolve in water and some that do not. Coal tar creosote components that dissolve in water may move through the soil to eventually reach and enter the groundwater, where they may persist. Once in the groundwater, breakdown may take years. Most of the components that are not water soluble will remain in place in a tar-like mass. Migration from the site of contamination is not extensive. Breakdown in soil can take months for some components of coal tar creosote, and much longer for others. Sometimes, the small amounts of chemical remaining in the soil or water that take a long time to break down are still toxic to some animals and possibly to humans. Coal tar creosote components may also be found in the soil as a result of leaking or seeping from treated timber.

Volatile chemicals in coal tar creosote may evaporate and enter the air. About 1-2% of the coal tar creosote applied to treated wood is released to the air. This is a small amount compared with the amount of coal tar creosote found in waste water or soil. Volatile chemicals in coal tar and coal tar pitch are released into the environment in a similar way. They are most often found in and around coke- or natural gas-producing factories, in industrial plants where coal tar and coal tar sludges are used, or at abandoned coke or gas factory sites. Water or soil surrounding these areas may contain detectable levels of coal tar or coal tar pitch.

Once coal tar creosote is in the environment, both plants and animals can absorb parts of the creosote mixture. Some components of coal tar creosote have been found in plants exposed to creosote-treated wood in nearby soil. The plants absorb very little (less than 0.5% of the amount available to the plant). Animals such as voles, crickets, snails, pill bugs, and worms take up coal tar creosote components from the environment that are passed into the body through skin, lungs, or stomachs. Animals that live in the water, such as crustacea, shellfish, and worms, also take up coal tar creosote compounds. For instance, mussels attached to creosote-treated pilings and snails and oysters living in water near a wood-treatment plant had creosote in their tissues. Coal tar creosote components are also broken down by microorganisms living in the

soil and natural water. The components of coal tar and coal tar pitch move in the environment in a similar way.

1.3 HOW MIGHT I BE EXPOSED TO CREOSOTE?

Most people are exposed to very low levels of creosote. People who are exposed to higher concentrations than the general population are those exposed to creosote in their jobs and those who use products that contain creosote to improve a health problem such as eczema or psoriasis.

Some people are exposed to creosote by using shampoos for psoriasis that contain creosote. Herbal remedies containing the leaves from the creosote bush (chaparral) are available as a dietary supplement and are a source of exposure to wood creosote. People who drink chaparral tea could be exposed to wood creosote. Hazardous waste sites are a major source of contamination with creosote, coal tar, and coal tar pitch. Individuals working in the wood-preserving industry make up the largest part of the population that might be exposed to coal tar creosote. Individuals who live in areas that used to be sites of wood-preserving facilities may be exposed if the soil was never cleaned up. The most common way that creosote will enter the body when it is present in soils is through the skin. In addition, children may also ingest creosote if they put their unwashed hands in their mouths after touching soil or wood contaminated with creosote. The most common way that it will enter the body for individuals in the wood-preserving industry is through the lungs.

Asphalt workers; rubber, aluminum, iron, steel, and tire factory workers; and people working in the coke-producing industries are also at risk for potential exposure to coal tar pitch and coal tar pitch volatiles. They may breathe in vapors from or have direct skin contact with wood-preservation solutions, freshly treated wood, asphalt mixtures, or other products of coke-producing industries. Workers who use creosote-treated wood in building fences, bridges, or railroad tracks or installing telephone poles may be exposed; those who inspect or maintain these materials, or apply asphalt or other coal tar pitch-containing materials, may also be exposed. Homeowners, farmers, or landscapers who apply coal tar creosote to wood in noncommercial settings using a brush or dip procedure (which is no longer allowed by law unless you have been trained to safely use creosote as a wood preservative), or who use railroad ties or telephone poles in landscaping, or who reclaim scrap lumber from a treated structure may also be exposed. In addition, people who work or live in treated-wood houses (log cabins) may be exposed through the air or by direct contact with the wood. Exposure to coal tar products may also occur in the natural gas and aluminum smelting industries. You can be exposed by any contact with water, soil, air, or plant and animal tissues that contain creosotes, coal tar, coal tar pitch, or its volatile components. Intentional or accidental eating of coal tar creosote has resulted in poisoning. If your activities bring you into contact with these mixtures, such as at hazardous waste sites, in contaminated groundwater, in wood products treated with creosote, or in contaminated shellfish, you will be exposed to coal tar creosote, coal tar, coal tar pitch, or coal tar pitch volatiles.You can also be exposed

by drinking water contaminated by a hazardous waste site.

1.4 HOW CAN CREOSOTE ENTER AND LEAVE MY BODY?

Creosotes and coal tar products can enter your body through the lungs, stomach, intestines, and skin. No information that describes how fast or how much creosote or its components might enter the body after one or many exposures is available. The amount that enters the body depends on how you come in contact with it (via air, food, water, skin), how much of the mixture is present, and how long you are exposed to it. Many of the parts of the coal tar creosote mixture (for example, PAHs) are rapidly absorbed through the lungs, stomach, and intestines. Prolonged exposure through the skin, without washing, may increase the amount of the creosotes or coal tar products that pass into the bloodstream. Individual components of coal tar creosote, coal tar, coal tar pitch, and coal tar pitch volatiles may be stored in body fat. In the body, some coal tar components may be metabolized. For example, pyrene can be metabolized to 1-hydroxypyrene. Some studies indicate that creosotes may cross the placenta into the tissue of the developing fetus. Because coal tar products may be stored in body fat, they may be found in breast milk. Creosotes leave the body primarily in the stool; a smaller amount leaves the body in the urine.

1.5 HOW CAN CREOSOTE AFFECT MY HEALTH?

To protect the public from the harmful effects of toxic chemicals and to find ways to treat people who have been harmed, scientists use many tests.

Exposure to creosotes, coal tar, coal tar pitch, or coal tar pitch volatiles may be harmful to your health. Eating food or drinking water contaminated with a high level of these compounds may cause a burning in the mouth and throat as well as stomach pain. Taking herbal remedies containing creosote bush leaves may result in damage to the liver or kidney. Reports describing poisoning in workers exposed to coal tar creosote, or in people who accidentally or intentionally ate coal tar creosote prove that these chemicals can be harmful. These reports indicate that brief exposure to large amounts of coal tar creosote may result in a rash or severe irritation of the skin, chemical burns of the surfaces of the eye, convulsions and mental confusion, kidney or liver problems, unconsciousness, or even death. Longer exposure to lower levels of coal tar creosote, coal tar, coal tar pitch or coal tar pitch volatiles by direct contact with the skin or by exposure to the vapors from these mixtures can also result in increased sensitivity to sunlight, damage to the cornea, and skin damage such as reddening, blistering, or peeling. Longer exposures to the vapors of the creosotes, coal tar, coal tar pitch, or coal tar pitch volatiles can also cause irritation of the respiratory tract. Skin cancer and cancer of the scrotum have also resulted from long exposure to low levels of these chemical mixtures, especially through direct contact with the skin during wood treatment or manufacture of coal tar creosote-

treated products, or in coke or natural gas factories. Prolonged skin exposure to soot and coal tar creosote has been associated with cancer of the scrotum in chimney sweeps. These levels are much higher than the levels that you are likely to be exposed to in groundwater, food, air, or soil.

One way to see if a chemical will hurt people is to learn how the chemical is absorbed, used, and released by the body; for some chemicals, animal testing may be necessary. Animal testing may also be used to identify health effects such as cancer or birth defects. Without laboratory animals, scientists would lose a basic method to get information needed to make wise decisions to protect public health. Scientists have the responsibility to treat research animals with care and compassion. Laws today protect the welfare of research animals, and scientists must comply with strict animal care guidelines.

Rats and mice fed a large amount of wood creosote at one time had convulsions and died. Rats fed a smaller amount of wood creosote for a long period developed kidney and liver problems, and died. Exposure to coal tar products through the skin has resulted in skin cancer in animals. Laboratory animals that ate food containing coal tar developed cancer of the lungs, liver, and stomach, and animals exposed to coal tar in the air developed lung and skin cancer.

The International Agency for Research on Cancer (IARC) has determined that coal tar is carcinogenic to humans and that creosote is probably carcinogenic to humans. EPA has also determined that coal tar creosote is a probable human carcinogen.

1.6 HOW CAN CREOSOTE AFFECT CHILDREN?

This section discusses potential health effects from exposures during the period from conception to maturity at 18 years of age in humans.

Children are generally exposed to very low levels of creosote, but intentional or accidental eating of coal tar creosote has resulted in poisoning. Children who live in hazardous waste areas contaminated with creosote may be exposed by drinking contaminated water or from contact with soil. The most common way that creosote will enter the body when it is present in soils is through the skin. However, children may also swallow creosote if they eat dirt or put their unwashed hands in their mouths after touching soil or wood contaminated with creosote. In addition, children may be exposed to creosote compounds if they eat fish and shellfish from contaminated areas. Children may also be exposed to creosote if they use products that contain creosote to improve a health problem such as dandruff, eczema, or psoriasis, or if they are given an herbal remedy containing the leaves from the creosote bush (chaparral).

Children may also be exposed to creosote if they breathe in vapors from or have direct skin contact with freshly treated wood found in fences, bridges, railroad ties, or telephone poles. In addition, children who live in treated-wood houses (log cabins) may be exposed through the air or by direct contact with the wood. The use of creosote to

protect wooden playground equipment or wooden decks for the yard is not recommended, but children may be exposed to creosote if it has been applied to wood in or around the home in the past. Children could also be exposed to creosote on their parent's clothing or shoes if these have been contaminated with creosote at the workplace. Children are not more likely to be exposed to creosote than adults, and there is no unique exposure of children to creosote.

Children who played on soil contaminated with creosote had more skin rashes than children who played in uncontaminated areas. Apart from this, the health effects of creosote have not been studied in children, but they would likely experience the same health effects seen in adults exposed to creosote. We do not know whether children differ from adults in their susceptibility to health effects from creosote. Children could be more susceptible to cancer because they might have a longer time in which to develop it, but this association has not been studied.

No effects have been reported for children exposed to creosote before birth. Experiments in laboratory animals have shown birth defects, such as cleft palates, in the young of mothers exposed to high levels of creosote during pregnancy, but whether creosote could induce such defects in humans is not known. Some animal studies indicate that creosotes may cross the placenta into the tissue of the developing fetus. Because chemical components of coal tar may be stored in body fat, they may be found in breast milk and therefore could be transferred to newborns and infants.

1.7 HOW CAN FAMILIES REDUCE THE RISK OF EXPOSURE TO CREOSOTE?

If your doctor finds that you have been exposed to significant amounts of creosote, coal tar, coal tar pitch, or coal tar pitch volatiles, ask whether your children might also be exposed. Your doctor might need to ask your state health department to investigate.

Families may reduce the risk of exposure to coal tar creosote, coal tar, coal tar pitch, and coal tar pitch volatiles in several ways if they find that they are at risk of such exposures. If you live in a residential area that used to have a wood preservation facility or gas manufacturing plant located nearby, you should use precautions to decrease or limit your exposure to creosote that may be present in the soil or water. This may include wearing long-sleeved shirts and long pants when working or playing outside and avoiding using water contaminated with creosote. If the soil in your yard was contaminated by creosote in the past, you should probably not grow food in it. You will need to wash your hands and any other exposed skin carefully after you are in contact with the contaminated soil or water outside. This is especially true for children since they have a tendency to put their hands in their mouths. Some children eat a lot of dirt. It is not fully understood how much of the creosote bound to dirt may come off the dirt when it is inside your body. You should discourage children from eating dirt. Make sure they wash their hands frequently and before eating. Discourage your children from putting their hands in their mouths or from engaging in other hand-to-mouth activity.

PUBLIC HEALTH STATEMENT
CREOSOTE

CAS#: Wood Creosote 8021-39-4
Coal Tar Creosote 8001-58-9
Coal Tar 8007-45-2

Division of Toxicology **September 2002**

Children may be exposed to creosote during their outdoor play activities. You should encourage your children not to play in contaminated areas, particularly in those that may be abandoned waste sites or waste sites undergoing cleanup. Some children will ignore signs posted at the sites that alert the public to possible dangers and declare the areas off limits. Encourage your children to follow the instructions on the signs and to play elsewhere. Children may come into contact with creosote-treated wood when playing on or near railroad tracks, in ditches close to utility poles, in old barns or other farm structures, or on bridges or piers. Children may also be exposed to creosote through ingestion if they chew or place their mouths on creosote-treated objects such as fence posts or pier railings. You should discourage your children from such behavior and from putting foreign objects in their mouths.

Drinking chaparral tea may result in exposure to wood creosote by swallowing. If you drink chaparral tea you may expose your children. Creosote is also found in coal tar shampoos used for anti-dandruff therapy, in coal tar ointments used for treatment of eczematous dermatitis and in mineral coal tar for the treatment of psoriasis. You may expose your children to creosote if you use any of these products. Ask your doctor to suggest alternative treatments that do not involve the use of these products.

It is sometimes possible to carry creosote into the home on work clothing or shoes that may have been exposed to coal tar creosote, coal tar, or coal tar pitch at the workplace. This may be of more importance for people who work in the wood-preserving industry or in jobs such as roofing, paving, and chimney cleaning than for people who work in the coking industry, or in other plants that use coal tar-derived products and for which the main route of exposure is through breathing in contaminated dust. You can contaminate your car, home, or other locations outside work where children might be exposed to creosote. You should know about this possibility if you work with creosote. Long-term exposure to low levels of creosote through direct contact with skin has resulted in skin cancer. For workers in wood preservation facilities, the American Wood Preservers Institute (AWPI) recommends washing work clothes separately from other household clothing if oily creosote residues or sawdust from creosote-treated wood are present on the clothes. Adults with contaminated work clothes should wash them before reusing them. If you work in an industry in which creosote is used, your occupational health and safety officer at work should tell you whether this or other chemicals you work with are dangerous and likely to be carried home on your clothes, body, or tools and whether you should be showering and changing clothes before you leave work, storing your street clothes in a separate area of the workplace, or laundering your work clothes at home separately from other clothes. Your employer should have Material Safety Data Sheets (MSDSs) for many of the chemicals used at your place of work, as required by the Occupational Safety and Health Administration (OSHA). Information on these sheets should include chemical names and hazardous ingredients, important properties (such as fire and explosion data), potential health effects, how you get the chemical(s) in your body, how to properly handle the materials,

and what to do in an emergency. Your employer is legally responsible for providing a safe workplace and should freely answer your questions about hazardous chemicals. Your OSHA-approved state occupational safety and health program or OSHA can answer any further questions and help your employer identify and correct problems with hazardous substances. Your OSHA-approved state occupational safety and health program or OSHA will listen to your formal complaints about workplace health hazards and inspect your workplace when necessary. Employees have a right to optimal safety and health on the job without fear of punishment.

Your children may be exposed to creosote compounds by eating certain types of fish and shellfish caught from certain locations. Certain states, American Indian tribes, and U.S. territories have issued freshwater fish advisories to warn people about creosote-contaminated fish. Each state, American Indian tribe, or U.S. territory sets its own criteria for issuing fish advisories. A fish advisory will specify which bodies of water have restrictions. The advisory will tell you what types and sizes of fish are of concern. The advisory may completely ban eating fish or tell you to limit your meals of a certain fish type. For example, an advisory may tell you to eat a certain type of fish no more than once a month. The advisory may tell you to eat only certain parts of the fish and how to prepare or cook the fish to decrease your exposure to creosote. The fish advisory may be stricter to protect pregnant women, nursing mothers, and young children. Chemicals in creosote have been found in breast milk and may cross the placenta. To reduce your child's exposure to creosote, obey fish advisories. Information on fish and wildlife advisories in your home state is available from your state health or natural resources department. Signs might also be posted in certain fishing areas.

Creosote is a restricted-use pesticide, meaning that it is only supposed to be applied by people who are trained to use it safely and who have been tested and approved to use it. It is not available over-the-counter for use in the home or garden. The AWPI does not recommend the use of creosote to protect wooden playground equipment or wooden decks for the yard. Other pesticides are generally used for preserving playground equipment and decks. Your children may be exposed to creosote if an unqualified person applies it to wood in or around your home, such as to sundecks or to wooden equipment your children play on. In some cases, the improper use of pesticides banned for use in homes has turned homes into hazardous waste sites. Make sure that any person you hire is licensed and, if appropriate (as is the case for creosote), certified to apply pesticides. Your state licenses each person who is qualified to apply pesticides according to EPA standards and further certifies each person who is qualified to apply restricted-use pesticides. Ask to see the license and certification. Also ask for the brand name of the pesticide, an MSDS, the name of the product's active ingredient (the chemical that makes the pesticide work), and the EPA registration number. Ask whether EPA has designated the pesticide "for restricted use" and what the approved uses are. This information is important if you or your family react to the product.

If you feel sick after a pesticide has been used in your home, consult your doctor or local poison control center.

1.8 IS THERE A MEDICAL TEST TO DETERMINE WHETHER I HAVE BEEN EXPOSED TO CREOSOTE?

No medical test will determine if you have been exposed to wood creosote, coal tar creosote, coal tar, coal tar pitch mixtures, or coal tar pitch volatiles. However, chemicals contained in creosote (such as PAHs or phenol) may be detected and measured in body tissues (organs, muscle, or fat), urine, or blood after exposure to creosote. Typically, this may be done for employees in industry who work with coal tar creosote, coal tar, and coal tar pitch to monitor their exposure. For example, the metabolite 1-hydroxypyrene, which can be detected in urine after exposure to pyrene, has been used to test for exposure to creosote because pyrene is a component of creosote. This test would determine only whether you have recently been exposed to pyrene, but cannot positively identify the source of the pyrene as creosote or accurately predict whether you will experience any adverse health effects. Moreover, analyses of urine samples for 1-hydroxypyrene are not normally done in a doctor's office because they require special equipment.

1.9 WHAT RECOMMENDATIONS HAS THE FEDERAL GOVERNMENT MADE TO PROTECT HUMAN HEALTH?

The federal government develops regulations and recommendations to protect public health. Regulations can be enforced by law. Federal agencies that develop regulations for toxic substances include the EPA, the OSHA, and the Food and Drug Administration (FDA). Recommendations provide valuable guidelines to protect public health but cannot be enforced by law. Federal organizations that develop recommendations for toxic substances include the ATSDR and the National Institute for Occupational Safety and Health (NIOSH).

Regulations and recommendations can be expressed in not-to-be-exceeded levels in air, water, soil, or food that are usually based on levels that affect animals; then they are adjusted to help protect people. Sometimes these not-to-be-exceeded levels differ among federal organizations because of different exposure times (an 8-hour workday or a 24-hour day), the use of different animal studies, or other factors.

Recommendations and regulations are also periodically updated as more information becomes available. For the most current information, check with the federal agency or organization that provides it. Some regulations and recommendations for creosote include the following:

On December 10, 1992, FDA issued a nationwide warning to consumers (FDA Press Release, P92-38) about chaparral, an herbal product derived from the leaves of the creosote bush, because of reports of acute toxic hepatitis after its use. The press release can be found at the FDA Web site, http://www.fda.gov.

Regulatory standards and guidelines for air and water exist for the most important individual PAHs and phenols contained in wood creosote, coal tar creosote, coal tar, and coal tar pitch. EPA has designated coal tar creosote a restricted-use pesticide. This means it can only be bought and used by certified applicators and only for those uses covered by the applicator's certification. In addition, coal tar creosote has been identified by EPA as a hazardous waste.

The federal government has developed regulatory standards and guidelines to protect workers from the potential health effects of other coal tar products in air. OSHA has set a Permissible Exposure Limit (PEL) of 0.2 milligrams of coal tar pitch volatiles per cubic meter of air (0.2 mg/m^3) in workroom air to protect workers during an 8-hour shift.

1.10 Where can I get more information?

If you have any more questions or concerns, please contact your community or state health or environmental quality department or:

Agency for Toxic Substances and Disease Registry
Division of Toxicology
1600 Clifton Road NE, Mailstop F-32
Atlanta, GA 30333

Information line and technical assistance:

Phone: 888-422-8737
FAX: (770)-488-4178

ATSDR can also tell you the location of occupational and environmental health clinics. These clinics specialize in recognizing, evaluating, and treating illnesses resulting from exposure to hazardous substances.

To order toxicological profiles, contact:

National Technical Information Service
5285 Port Royal Road
Springfield, VA 22161
Phone: 800-553-6847 or 703-605-6000

Reference

Agency for Toxic Substances and Disease Registry (ATSDR). 2002. Toxicological profile for creosote. Atlanta, GA: U.S. Department of Health and Human Services, Public Health Service.

Appendix F

Quantitative Sport Count Laboratory Report and Chain of Custody Form

OrderID: 371800630 iroScience EMSL Customer No. ENVI54

Microbiology Chain of Custody

EMSL Order Number (*Lab Use Only*): 371800630

PHONE:
FAX:

Company : Fuss & O'Neill EnviroScience, LLC	**EMSL-Bill to:** ☐ Different ☒ Same If Bill to is Different note instructions in Comments** *Third Party Billing requires written authorization from third party*
Street: 146 Hartford Road	
City: Manchester **State/Province:** CT	**Zip/Postal Code:** **Country:**
Report To (Name): Karron Redfield/ Jared Smith	**Telephone #:**
Email Address: kredfield@fando.com/ jsmith@fando.com	**Fax #:** **Purchase Order:**
Project Name/Number: John Pettibone Community Center/ 20171128.A1E	**Please Provide Results:** ☐ FAX ☒ E-mail ☐ Mail
U.S. State Samples Taken: Connecticut	**Connecticut Samples:** ☒ Commercial ☐ Residential

Turnaround Time (TAT) Options* - Please Check

☐ 3 Hour ☐ 6 Hour ☐ 24 Hour ☐ 48 Hour ☐ 72 Hour ☐ 96 Hour ■ 1 Week ☐ 2 Week

**Analysis completed in accordance with EMSL's Terms and Conditions located in the Analytical Price Guide. TATs are subject to methodology requirements*

Non Culturable Air Samples (Spore Traps) – Test Codes

• **M001** Air-O-Cell • **M049** BioSIS • **M030** Micro 5	• **M173** Allegro M2 • **M003** Burkard • **M174** MoldSnap	• **M004** Allergenco • **M043** Cyclex • **M176** Relle Smart	• **M032** Allergenco-D • **M002** Cyclex-d • **M130** Via-Cell	• **M172** Versa Trap

Other Microbiology Test Codes

• **M041** Fungal Direct Examination • **M005** Viable Fungi ID and Count • **M006** Viable Fungi ID and Count (Speciation) • **M007** Culturable Fungi • **M008** Culturable Fungi (Speciation) • **M009** Gram Stain Culturable Bacteria • **M010** Bacterial Count and ID – 3 Most Prominent • **M011** Bacterial Count and ID – 5 Most Prominent • **M013** Sewage Contamination in Buildings	• **M014** Endotoxin Analysis • **M015** Heterotrophic Plate Count • **M180** Real Time Q-PCR-ERMI 36 Panel • **M018** Total Coliform (Membrane Filtration) • **M020** Fecal *Streptococcus* (Membrane Filtration) • **M210-215** *Legionella* Detection • **M026** Recreational Water Screen • **M027** Mycotoxin Analysis	• **M029** *Enterococci* • **M019** Fecal Coliform • **M133** MRSA Analysis • **M028** *Cryptococcus neoformans* Detection • **M120** *Histoplasma capsulatum* Detection • **M033-39** Allergen Testing • **M044** Group Allergen (Cat, Dog, Cockroach, Dustmites) • **Other** See Analytical Price Guide

RECEIVED EMSL CINNAMINSON, N.J. 2018 JAN 5 A 8:55

Preservation Method (Water): – N/A

Name of Sampler: Scott Mossey **Signature of Sampler:** Scott M

Sample #	Sample Location	Sample Type	Test Code	Volume/Area	Date/Time Collected
Example: A1	Kitchen	Air	M001	75L	1/1/12 4:00 PM
01-11-18-SMM-01	Exterior North West Entrance(Pre)	Air	M001	150L	01/11/18-1155
01-11-18-SMM-02	Facilities Office	Air	M001	150L	01/11/18-1215
01-11-18-SMM-03	Cafeteria	Air	M001	150L	01/11/18-1230
01-11-18-SMM-04	Gymnasium	Air	M001	150L	01/11/18-1240
01-11-18-SMM-05	Room 31/ Music Room	Air	M001	150L	01/11/18-1305
01-11-18-SMM-06	Parks and Rec's Office	Air	M001	150L	01/11/18-1320
01-11-18-SMM-07	Room 2/ Computer Lab	Air	M001	150L	01/11/18-1335
01-11-18-SMM-08	Room 8	Air	M001	150L	01/11/18-1350
01-11-18-SMM-09	Hallway connector/ South West	Air	M001	150L	01/11/18-1405

Client Sample # (s): -01-11-18-SMM-01 thru 15 **Total # of Samples:** 15 AT

Relinquished (Client): Scott Mossey/Scott M **Date:** 01/12/18 **Time:** 1230

Received (Client): BW FD **Date:** 1/15/18 **Time:** 945

Comments:

Microbiology Chain of Custody

EMSL Order Number (*Lab Use Only*):

371800630

PHONE:
FAX:

Additional Pages of the Chain of Custody are only necessary if needed for additional sample information

Sample #	Sample Location	Sample Type	Test Code	Volume/Area	Date/Time Collected
01-11-18-SMM-10	Room 11	Air	M001	150L	01/11/18- 1430
01-11-18-SMM-11	Room 22 Youth Agency	Air	M001	150L	01/11/18- 1455
01-11-18-SMM-12	Room 25/ Storage Room	Air	M001	150L	01/11/18- 1510
01-11-18-SMM-13	Room 34/ Social Services	Air	M001	150L	01/11/18- 1520
01-11-18-SMM-14	Room 39/ Social Services)	Air	M001	150L	01/11/18- 1545
01-11-18-SMM-15	Exterior North West Entrance(Post)	Air	M001	150L	01/11/18- 1610

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EMSL
CINNAMINSON, N.J.
2018 JAN 15 A 9:55

**Comments/Special Instructions:

EMSL Analytical, Inc.

200 Route 130 North Cinnaminson, NJ 08077
Tel/Fax: (800) 220-3675 / (856) 786-0262
http://www.EMSL.com / cinnmicrolab@emsl.com

EMSL Order: 371800630
Customer ID: ENVI54
Customer PO: 20171128.A1E
Project ID:

Attn: Jared Smith
Fuss & O'Neill EnviroScience, LLC
146 Hartford Road
Manchester, CT 06040

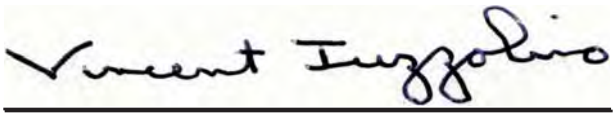
Phone: (860) 646-2469
Fax: (888) 838-1160
Collected: 01/11/2018
Received: 01/15/2018
Analyzed: 01/18/2018

Project: John Pettibone Community Center / 20171128.A1E

Test Report: Air-O-Cell(™) Analysis of Fungal Spores & Particulates by Optical Microscopy (Methods EMSL 05-TP-003, ASTM D7391)

Lab Sample Number:	371800630-0001			371800630-0002			371800630-0003		
Client Sample ID:	01-11-18-SMM-01			01-11-18-SMM-02			01-11-18-SMM-03		
Volume (L):	150			150			150		
Sample Location	Exterior North West Entrance (Pre)			Facilities Office			Cafeteria		
Spore Types	**Raw Count**	**Count/m³**	**% of Total**	**Raw Count**	**Count/m³**	**% of Total**	**Raw Count**	**Count/m³**	**% of Total**
Alternaria	-	-	-	-	-	-	-	-	-
Ascospores	1	20	4.5	-	-	-	-	-	-
Aspergillus/Penicillium	10	220	50	1	20	6.3	3	70	50
Basidiospores	3	70	15.9	3	70	22.1	-	-	-
Bipolaris++	-	-	-	-	-	-	-	-	-
Chaetomium	-	-	-	-	-	-	-	-	-
Cladosporium	4	90	20.5	1*	7*	2.2	-	-	-
Curvularia	-	-	-	-	-	-	-	-	-
Epicoccum	-	-	-	-	-	-	-	-	-
Fusarium	-	-	-	-	-	-	-	-	-
Ganoderma	-	-	-	-	-	-	-	-	-
Myxomycetes++	-	-	-	1	20	6.3	-	-	-
Pithomyces	-	-	-	-	-	-	-	-	-
Rust	-	-	-	-	-	-	-	-	-
Scopulariopsis	-	-	-	-	-	-	-	-	-
Stachybotrys	1	20	4.5	7	200	63.1	3	70	50
Torula	-	-	-	-	-	-	-	-	-
Ulocladium	-	-	-	-	-	-	-	-	-
Unidentifiable Spores	-	-	-	-	-	-	-	-	-
Bispora	1	20	4.5	-	-	-	-	-	-
Diplocladiella	-	-	-	-	-	-	-	-	-
Nigrospora	-	-	-	-	-	-	-	-	-
Pestalotia/Pestalotiopsis	-	-	-	-	-	-	-	-	-
Total Fungi	**20**	**440**	**100**	**13**	**317**	**100**	**6**	**140**	**100**
Hyphal Fragment	1	20	-	-	-	-	1	20	-
Insect Fragment	-	-	-	-	-	-	-	-	-
Pollen	-	-	-	-	-	-	1	20	-
Analyt. Sensitivity 600x	-	22	-	-	22	-	-	22	-
Analyt. Sensitivity 300x	-	7*	-	-	7*	-	-	7*	-
Skin Fragments (1-4)	-	1	-	-	2	-	-	2	-
Fibrous Particulate (1-4)	-	1	-	-	1	-	-	1	-
Background (1-5)	-	2	-	-	2	-	-	2	-

Bipolaris++ = Bipolaris/Drechslera/Exserohilum
Myxomycetes++ = Myxomycetes/Periconia/Smut



High levels of background particulate can obscure spores and other particulates leading to underestimation. Background levels of 5 indicate an overloading of background particulates, prohibiting accurate detection and quantification. Present = Spores detected on overloaded samples. Results are not blank corrected unless otherwise noted. The detection limit is equal to one fungal spore, structure, pollen, fiber particle or insect fragment. "*" Denotes particles found at 300X. "-" Denotes not detected. Due to method stopping rules, raw counts in excess of 100 are extrapolated based on the percentage analyzed. EMSL maintains liability limited to cost of analysis. This report relates only to the samples reported above and may not be reproduced, except in full, without written approval by EMSL. EMSL bears no responsibility for sample collection activities or analytical method limitations. Interpretation and use of test results are the responsibility of the client. Samples received in good condition unless otherwise noted.

Samples analyzed by EMSL Analytical, Inc. Cinnaminson, NJ AIHA-LAP, LLC--EMLAP Lab 100194

Initial report from: 01/18/2018 17:08:26

For information on the fungi listed in this report, please visit the Resources section at www.emsl.com

EMSL Analytical, Inc.

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http://www.EMSL.com / cinnmicrolab@emsl.com

EMSL Order: 371800630
Customer ID: ENVI54
Customer PO: 20171128.A1E
Project ID:

Attn: Jared Smith
Fuss & O'Neill EnviroScience, LLC
146 Hartford Road
Manchester, CT 06040

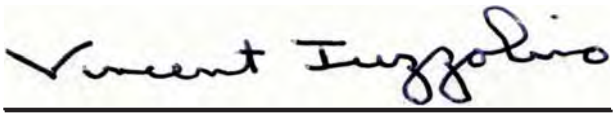
Phone: (860) 646-2469
Fax: (888) 838-1160
Collected: 01/11/2018
Received: 01/15/2018
Analyzed: 01/18/2018

Project: John Pettibone Community Center / 20171128.A1E

Test Report: Air-O-Cell(™) Analysis of Fungal Spores & Particulates by Optical Microscopy (Methods EMSL 05-TP-003, ASTM D7391)

Lab Sample Number:	371800630-0004			371800630-0005			371800630-0006		
Client Sample ID:	01-11-18-SMM-04			01-11-18-SMM-05			01-11-18-SMM-06		
Volume (L):	150			150			150		
Sample Location	Gymnasium			Room 31 / Music Room			Parks And Rec's Office		
Spore Types	**Raw Count**	**Count/m³**	**% of Total**	**Raw Count**	**Count/m³**	**% of Total**	**Raw Count**	**Count/m³**	**% of Total**
Alternaria	-	-	-	1	20	21.3	1*	7*	3.6
Ascospores	-	-	-	-	-	-	-	-	-
Aspergillus/Penicillium	2	40	50	1	20	21.3	-	-	-
Basidiospores	-	-	-	1	20	21.3	2	40	20.3
Bipolaris++	-	-	-	-	-	-	-	-	-
Chaetomium	-	-	-	-	-	-	-	-	-
Cladosporium	1	20	25	1	20	21.3	2	40	20.3
Curvularia	-	-	-	-	-	-	-	-	-
Epicoccum	-	-	-	-	-	-	-	-	-
Fusarium	-	-	-	-	-	-	-	-	-
Ganoderma	-	-	-	-	-	-	-	-	-
Myxomycetes++	-	-	-	1*	7*	7.4	3	70	35.5
Pithomyces	-	-	-	-	-	-	-	-	-
Rust	-	-	-	-	-	-	1	20	10.2
Scopulariopsis	-	-	-	-	-	-	-	-	-
Stachybotrys	1	20	25	1*	7*	7.4	1	20	10.2
Torula	-	-	-	-	-	-	-	-	-
Ulocladium	-	-	-	-	-	-	-	-	-
Unidentifiable Spores	-	-	-	-	-	-	-	-	-
Bispora	-	-	-	-	-	-	-	-	-
Diplocladiella	-	-	-	-	-	-	-	-	-
Nigrospora	-	-	-	-	-	-	-	-	-
Pestalotia/Pestalotiopsis	-	-	-	-	-	-	-	-	-
Total Fungi	**4**	**80**	**100**	**6**	**94**	**100**	**10**	**197**	**100**
Hyphal Fragment	-	-	-	-	-	-	1	20	-
Insect Fragment	-	-	-	-	-	-	1	20	-
Pollen	-	-	-	-	-	-	-	-	-
Analyt. Sensitivity 600x	-	22	-	-	22	-	-	22	-
Analyt. Sensitivity 300x	-	7*	-	-	7*	-	-	7*	-
Skin Fragments (1-4)	-	1	-	-	2	-	-	2	-
Fibrous Particulate (1-4)	-	1	-	-	1	-	-	1	-
Background (1-5)	-	1	-	-	2	-	-	2	-

Bipolaris++ = Bipolaris/Drechslera/Exserohilum
Myxomycetes++ = Myxomycetes/Periconia/Smut



High levels of background particulate can obscure spores and other particulates leading to underestimation. Background levels of 5 indicate an overloading of background particulates, prohibiting accurate detection and quantification. Present = Spores detected on overloaded samples. Results are not blank corrected unless otherwise noted. The detection limit is equal to one fungal spore, structure, pollen, fiber particle or insect fragment. "*" Denotes particles found at 300X. "-" Denotes not detected. Due to method stopping rules, raw counts in excess of 100 are extrapolated based on the percentage analyzed. EMSL maintains liability limited to cost of analysis. This report relates only to the samples reported above and may not be reproduced, except in full, without written approval by EMSL. EMSL bears no responsibility for sample collection activities or analytical method limitations. Interpretation and use of test results are the responsibility of the client. Samples received in good condition unless otherwise noted.

Samples analyzed by EMSL Analytical, Inc. Cinnaminson, NJ AIHA-LAP, LLC--EMLAP Lab 100194

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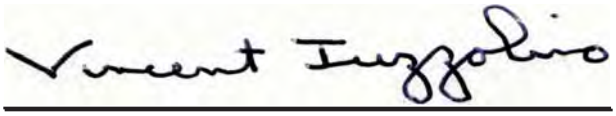
Test Report: Air-O-Cell(™) Analysis of Fungal Spores & Particulates by Optical Microscopy (Methods EMSL 05-TP-003, ASTM D7391)

Lab Sample Number:	371800630-0007			371800630-0008			371800630-0009		
Client Sample ID:	01-11-18-SMM-07			01-11-18-SMM-08			01-11-18-SMM-09		
Volume (L):	150			150			150		
Sample Location	Room 2/ Computer Lab			Room 8			Hallway Connector / South West		
Spore Types	**Raw Count**	**Count/m³**	**% of Total**	**Raw Count**	**Count/m³**	**% of Total**	**Raw Count**	**Count/m³**	**% of Total**
Alternaria	-	-	-	-	-	-	-	-	-
Ascospores	-	-	-	-	-	-	1	20	3
Aspergillus/Penicillium	2	40	17.6	-	-	-	1	20	3
Basidiospores	2	40	17.6	8	200	36.4	6	100	14.9
Bipolaris++	-	-	-	-	-	-	-	-	-
Chaetomium	-	-	-	-	-	-	1	20	3
Cladosporium	3	70	30.8	4	90	16.4	10	220	32.8
Curvularia	-	-	-	-	-	-	-	-	-
Epicoccum	-	-	-	-	-	-	1	20	3
Fusarium	-	-	-	-	-	-	-	-	-
Ganoderma	-	-	-	1	20	3.6	1	20	3
Myxomycetes++	1*	7*	3.1	8	200	36.4	5	100	14.9
Pithomyces	-	-	-	1	20	3.6	1	20	3
Rust	-	-	-	-	-	-	1	20	3
Scopulariopsis	-	-	-	-	-	-	-	-	-
Stachybotrys	3	70	30.8	1	20	3.6	4	90	13.4
Torula	-	-	-	-	-	-	-	-	-
Ulocladium	-	-	-	-	-	-	-	-	-
Unidentifiable Spores	-	-	-	-	-	-	-	-	-
Bispora	-	-	-	-	-	-	-	-	-
Diplocladiella	-	-	-	-	-	-	1	20	3
Nigrospora	-	-	-	-	-	-	-	-	-
Pestalotia/Pestalotiopsis	-	-	-	-	-	-	-	-	-
Total Fungi	**11**	**227**	**100**	**23**	**550**	**100**	**33**	**670**	**100**
Hyphal Fragment	1	20	-	1	20	-	9	200	-
Insect Fragment	-	-	-	2	40	-	1	20	-
Pollen	-	-	-	-	-	-	-	-	-
Analyt. Sensitivity 600x	-	22	-	-	22	-	-	22	-
Analyt. Sensitivity 300x	-	7*	-	-	7*	-	-	7*	-
Skin Fragments (1-4)	-	2	-	-	2	-	-	2	-
Fibrous Particulate (1-4)	-	1	-	-	1	-	-	1	-
Background (1-5)	-	2	-	-	2	-	-	3	-

Bipolaris++ = Bipolaris/Drechslera/Exserohilum
Myxomycetes++ = Myxomycetes/Periconia/Smut



High levels of background particulate can obscure spores and other particulates leading to underestimation. Background levels of 5 indicate an overloading of background particulates, prohibiting accurate detection and quantification. Present = Spores detected on overloaded samples. Results are not blank corrected unless otherwise noted. The detection limit is equal to one fungal spore, structure, pollen, fiber particle or insect fragment. "*" Denotes particles found at 300X. "-" Denotes not detected. Due to method stopping rules, raw counts in excess of 100 are extrapolated based on the percentage analyzed. EMSL maintains liability limited to cost of analysis. This report relates only to the samples reported above and may not be reproduced, except in full, without written approval by EMSL. EMSL bears no responsibility for sample collection activities or analytical method limitations. Interpretation and use of test results are the responsibility of the client. Samples received in good condition unless otherwise noted.

Samples analyzed by EMSL Analytical, Inc. Cinnaminson, NJ AIHA-LAP, LLC--EMLAP Lab 100194

Initial report from: 01/18/2018 17:08:26

For information on the fungi listed in this report, please visit the Resources section at www.emsl.com

EMSL Analytical, Inc.

200 Route 130 North Cinnaminson, NJ 08077
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http://www.EMSL.com / cinnmicrolab@emsl.com

EMSL Order: 371800630
Customer ID: ENVI54
Customer PO: 20171128.A1E
Project ID:

Attn: Jared Smith
Fuss & O'Neill EnviroScience, LLC
146 Hartford Road
Manchester, CT 06040

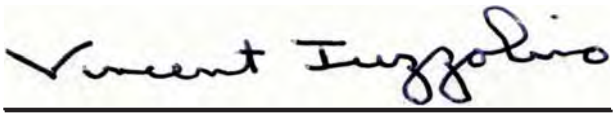
Phone: (860) 646-2469
Fax: (888) 838-1160
Collected: 01/11/2018
Received: 01/15/2018
Analyzed: 01/18/2018

Project: John Pettibone Community Center / 20171128.A1E

Test Report: Air-O-Cell(™) Analysis of Fungal Spores & Particulates by Optical Microscopy (Methods EMSL 05-TP-003, ASTM D7391)

Lab Sample Number:	371800630-0010			371800630-0011			371800630-0012		
Client Sample ID:	01-11-18-SMM-10			01-11-18-SMM-11			01-11-18-SMM-12		
Volume (L):	150			150			150		
Sample Location	Room 11			Room 22 Youth Agency			Room 25 / Storage Room		
Spore Types	**Raw Count**	**Count/m³**	**% of Total**	**Raw Count**	**Count/m³**	**% of Total**	**Raw Count**	**Count/m³**	**% of Total**
Alternaria	2	40	4.4	-	-	-	-	-	-
Ascospores	-	-	-	8	200	41.1	-	-	-
Aspergillus/Penicillium	1	20	2.2	4	90	18.5	3	70	36.8
Basidiospores	6	100	10.9	2	40	8.2	2	40	21.1
Bipolaris++	-	-	-	-	-	-	-	-	-
Chaetomium	-	-	-	-	-	-	-	-	-
Cladosporium	13	290	31.7	4	90	18.5	1	20	10.5
Curvularia	-	-	-	-	-	-	-	-	-
Epicoccum	5	100	10.9	-	-	-	-	-	-
Fusarium	-	-	-	-	-	-	-	-	-
Ganoderma	1	20	2.2	-	-	-	-	-	-
Myxomycetes++	12	270	29.5	1*	7*	1.4	2	40	21.1
Pithomyces	1*	7*	0.8	1	20	4.1	-	-	-
Rust	2	40	4.4	-	-	-	-	-	-
Scopulariopsis	-	-	-	-	-	-	-	-	-
Stachybotrys	-	-	-	2	40	8.2	1	20	10.5
Torula	-	-	-	-	-	-	-	-	-
Ulocladium	-	-	-	-	-	-	-	-	-
Unidentifiable Spores	-	-	-	-	-	-	-	-	-
Bispora	-	-	-	-	-	-	-	-	-
Diplocladiella	-	-	-	-	-	-	-	-	-
Nigrospora	1*	7*	0.8	-	-	-	-	-	-
Pestalotia/Pestalotiopsis	1	20	2.2	-	-	-	-	-	-
Total Fungi	**45**	**914**	**100**	**22**	**487**	**100**	**9**	**190**	**100**
Hyphal Fragment	2	40	-	1	20	-	1	20	-
Insect Fragment	1	20	-	-	-	-	-	-	-
Pollen	-	-	-	-	-	-	-	-	-
Analyt. Sensitivity 600x	-	22	-	-	22	-	-	22	-
Analyt. Sensitivity 300x	-	7*	-	-	7*	-	-	7*	-
Skin Fragments (1-4)	-	2	-	-	2	-	-	2	-
Fibrous Particulate (1-4)	-	1	-	-	1	-	-	1	-
Background (1-5)	-	2	-	-	2	-	-	2	-

Bipolaris++ = Bipolaris/Drechslera/Exserohilum
Myxomycetes++ = Myxomycetes/Periconia/Smut



High levels of background particulate can obscure spores and other particulates leading to underestimation. Background levels of 5 indicate an overloading of background particulates, prohibiting accurate detection and quantification. Present = Spores detected on overloaded samples. Results are not blank corrected unless otherwise noted. The detection limit is equal to one fungal spore, structure, pollen, fiber particle or insect fragment. "*" Denotes particles found at 300X. "-" Denotes not detected. Due to method stopping rules, raw counts in excess of 100 are extrapolated based on the percentage analyzed. EMSL maintains liability limited to cost of analysis. This report relates only to the samples reported above and may not be reproduced, except in full, without written approval by EMSL. EMSL bears no responsibility for sample collection activities or analytical method limitations. Interpretation and use of test results are the responsibility of the client. Samples received in good condition unless otherwise noted.

Samples analyzed by EMSL Analytical, Inc. Cinnaminson, NJ AIHA-LAP, LLC--EMLAP Lab 100194

Initial report from: 01/18/2018 17:08:26

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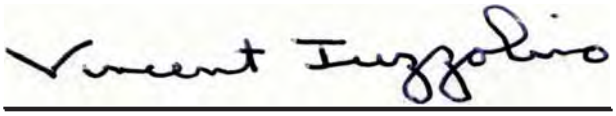
Phone: (860) 646-2469
Fax: (888) 838-1160
Collected: 01/11/2018
Received: 01/15/2018
Analyzed: 01/18/2018

Project: John Pettibone Community Center / 20171128.A1E

Test Report: Air-O-Cell(™) Analysis of Fungal Spores & Particulates by Optical Microscopy (Methods EMSL 05-TP-003, ASTM D7391)

Lab Sample Number:	371800630-0013			371800630-0014			371800630-0015		
Client Sample ID:	01-11-18-SMM-13			01-11-18-SMM-14			01-11-18-SMM-15		
Volume (L):	150			150			150		
Sample Location	Room 34 / Social Services			Room 39 / Social Services			Exterior North West Entrance (Post)		
Spore Types	**Raw Count**	**Count/m³**	**% of Total**	**Raw Count**	**Count/m³**	**% of Total**	**Raw Count**	**Count/m³**	**% of Total**
Alternaria	-	-	-	-	-	-	-	-	-
Ascospores	-	-	-	-	-	-	1	20	11.1
Aspergillus/Penicillium	-	-	-	32	710	87.7	6	100	55.6
Basidiospores	3	70	56.5	-	-	-	-	-	-
Bipolaris++	-	-	-	-	-	-	-	-	-
Chaetomium	-	-	-	-	-	-	-	-	-
Cladosporium	-	-	-	2	40	4.9	1	20	11.1
Curvularia	-	-	-	-	-	-	-	-	-
Epicoccum	1*	7*	5.6	-	-	-	-	-	-
Fusarium	-	-	-	-	-	-	-	-	-
Ganoderma	-	-	-	-	-	-	-	-	-
Myxomycetes++	1	20	16.1	1	20	2.5	1	20	11.1
Pithomyces	1	20	16.1	-	-	-	-	-	-
Rust	1*	7*	5.6	1	20	2.5	-	-	-
Scopulariopsis	-	-	-	-	-	-	-	-	-
Stachybotrys	-	-	-	1	20	2.5	-	-	-
Torula	-	-	-	-	-	-	-	-	-
Ulocladium	-	-	-	-	-	-	-	-	-
Unidentifiable Spores	-	-	-	-	-	-	-	-	-
Bispora	-	-	-	-	-	-	1	20	11.1
Diplocladiella	-	-	-	-	-	-	-	-	-
Nigrospora	-	-	-	-	-	-	-	-	-
Pestalotia/Pestalotiopsis	-	-	-	-	-	-	-	-	-
Total Fungi	**7**	**124**	**100**	**37**	**810**	**100**	**10**	**180**	**100**
Hyphal Fragment	-	-	-	-	-	-	3	70	-
Insect Fragment	-	-	-	-	-	-	-	-	-
Pollen	-	-	-	1	20	-	-	-	-
Analyt. Sensitivity 600x	-	22	-	-	22	-	-	22	-
Analyt. Sensitivity 300x	-	7*	-	-	7*	-	-	7*	-
Skin Fragments (1-4)	-	2	-	-	2	-	-	2	-
Fibrous Particulate (1-4)	-	1	-	-	1	-	-	1	-
Background (1-5)	-	3	-	-	2	-	-	2	-

Bipolaris++ = Bipolaris/Drechslera/Exserohilum
Myxomycetes++ = Myxomycetes/Periconia/Smut



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Samples analyzed by EMSL Analytical, Inc. Cinnaminson, NJ AIHA-LAP, LLC--EMLAP Lab 100194

Initial report from: 01/18/2018 17:08:26

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FUSS & O'NEILL
EnviroScience, LLC

Appendix G

Direct Microscopic Examination Laboratory Report and Chain of Custody Form

OrderID: 371800631

Fuss & O'Neill EnviroScience EMSL Customer No. ENVI54

Microbiology Chain of Custody

EMSL Order Number (*Lab Use Only*): 371800631

PHONE:
FAX:

Company : Fuss & O'Neill EnviroScience, LLC	**EMSL-Bill to:** ☐ Different ☒ Same If Bill to is Different note instructions in Comments**
Street: 146 Hartford Road	*Third Party Billing requires written authorization from third party*
City: Manchester **State/Province:** CT	**Zip/Postal Code:** **Country:**
Report To (Name): Karron Redfield/ Jared Smith	**Telephone #:**
Email Address: kredfield@fando.com/ jsmith@fando.com	**Fax #:** **Purchase Order:**
Project Name/Number: John Pettibone Community Center/ 20171128.A1E	**Please Provide Results:** ☐ FAX ☐ E-mail ☐ Mail
U.S. State Samples Taken: Connecticut	**Connecticut Samples:** ☒ Commercial ☐ Residential

Turnaround Time (TAT) Options* - Please Check

☐ 3 Hour ☐ 6 Hour ☐ 24 Hour ☐ 48 Hour ☐ 72 Hour ☐ 96 Hour ■ 1 Week ☐ 2 Week

**Analysis completed in accordance with EMSL's Terms and Conditions located in the Analytical Price Guide. TATs are subject to methodology requirements*

RECEIVED EMSL MANCHESTER, N.J. 2018 JAN 5 A 9:47

Non Culturable Air Samples (Spore Traps) – Test Codes

- **M001** Air-O-Cell
- **M049** BioSIS
- **M030** Micro 5
- **M173** Allegro M2
- **M003** Burkard
- **M174** MoldSnap
- **M004** Allergenco
- **M043** Cyclex
- **M176** Relle Smart
- **M032** Allergenco-D
- **M002** Cyclex-d
- **M130** Via-Cell
- **M172** Versa Trap

Other Microbiology Test Codes

- **M041** Fungal Direct Examination
- **M005** Viable Fungi ID and Count
- **M006** Viable Fungi ID and Count (Speciation)
- **M007** Culturable Fungi
- **M008** Culturable Fungi (Speciation)
- **M009** Gram Stain Culturable Bacteria
- **M010** Bacterial Count and ID – 3 Most Prominent
- **M011** Bacterial Count and ID – 5 Most Prominent
- **M013** Sewage Contamination in Buildings
- **M014** Endotoxin Analysis
- **M015** Heterotrophic Plate Count
- **M180** Real Time Q-PCR-ERMI 36 Panel
- **M018** Total Coliform (Membrane Filtration)
- **M020** Fecal *Streptococcus* (Membrane Filtration)
- **M210-215** *Legionella* Detection
- **M026** Recreational Water Screen
- **M027** Mycotoxin Analysis
- **M029** *Enterococci*
- **M019** Fecal Coliform
- **M133** MRSA Analysis
- **M028** *Cryptococcus neoformans* Detection
- **M120** *Histoplasma capsulatum* Detection
- **M033-39** Allergen Testing
- **M044** Group Allergen (Cat, Dog, Cockroach, Dustmites)
- **Other** See Analytical Price Guide

Preservation Method (Water): – None

Name of Sampler: Scott Mossey **Signature of Sampler:** Scott M

Sample #	Sample Location	Sample Type	Test Code	Volume/Area	Date/Time Collected
Example: A1	Kitchen	Air	M001	75L	1/1/12 4:00 PM
01-11-18-SWAB-01	Parks and Rec's Office vent difusser	Swab	M041	2" Sq	01/11/18-1325
01-11-18SWAB-02	Room 18 Crawl space Fiberglass insulation jacket	Swab	M041	2" Sq	01/11/18-1435
	est				

Client Sample # (s): -01-11-18-SWAB-01 thru 02 **Total # of Samples:** 2 AT

Relinquished (Client): Scott Mossey **Date:** 01/12/18 **Time:** 1230

Received (Client): BW FD **Date:** 1/15/18 **Time:** 945

Comments:

EMSL Analytical, Inc.
200 Route 130 North Cinnaminson, NJ 08077
Phone/Fax: (800) 220-3675 / (856) 786-0262
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Order ID:	371800631
Customer ID:	ENVI54
Customer PO:	20171128.A1E
Project ID:	

Attn: Jared Smith
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Phone:	(860) 646-2469
Fax:	(888) 838-1160
Collected:	01/11/2018
Received:	01/15/2018
Analyzed:	01/18/2018

Proj: John Pettibone Community Center / 20171128.A1E

Test Report: Microscopic Examination of Fungal Spores, Fungal Structures, Hyphae, and Other Particulates from Swab Samples (EMSL Method: M041)

Lab Sample Number:	371800631-0001	371800631-0002			
Client Sample ID:	01-11-18-SWAB-01	01-11-18-SWAB-02			
Sample Location:	Parks And Rec's Office Vent Diffuser	Room 18 Crawl Space Fiberglass Insulation Jacket			
Spore Types	Category	Category	-	-	-
Agrocybe/Coprinus	-	-	-	-	-
Alternaria	-	Rare	-	-	-
Ascospores	-	-	-	-	-
Aspergillus/Penicillium	-	-	-	-	-
Basidiospores	Rare	-	-	-	-
Bipolaris++	-	-	-	-	-
Chaetomium	-	Rare	-	-	-
Cladosporium	-	*High*	-	-	-
Curvularia	-	-	-	-	-
Epicoccum	-	*Low*	-	-	-
Fusarium	-	-	-	-	-
Ganoderma	-	-	-	-	-
Myxomycetes++	-	-	-	-	-
Paecilomyces	-	-	-	-	-
Rust	-	-	-	-	-
Scopulariopsis	-	-	-	-	-
Stachybotrys	-	*High*	-	-	-
Torula	-	-	-	-	-
Ulocladium	-	Rare	-	-	-
Unidentifiable Spores	-	-	-	-	-
Zygomycetes	-	-	-	-	-
Microascus	-	High	-	-	-
Penicillium	-	*High*	-	-	-
Pithomyces	-	Rare	-	-	-
Yeast	*High*	-	-	-	-
Fibrous Particulate	-	-	-	-	-
Hyphal Fragment	-	-	-	-	-
Insect Fragment	-	-	-	-	-
Pollen	-	-	-	-	-

Category: Count/per area analyzed
Rare: 1 to 10 Low: 11 to 100 Medium: 101 to 1000 High: >1000

Bipolaris++ = Bipolaris/Dreschlera/Exserohilum Myxomycetes++ = Myxomycetes/Periconia/Smut
* = Sample contains fruiting structures and/or hyphae associated with the spores.

No discernable field blank was submitted with this group of samples.

Vincent Iuzzolino, M.S., Laboratory Director
or Other Approved Signatory

Initial report from: 01/19/2018 17:23:27

For Information on the fungi listed in this report please visit the Resources section at www.emsl.com

Appendix H

Site Photographs

Exterior roof showing buildings exhaust points

Example of rubber membrane roof

Example of rubber membrane roof and trough roof design

Room exhaust fan control box (two are present in the building)

Assumed creosote treated wood

Assumed creosote treated wood

Mold impacted pipe insulation within pipe tunnel

Example of typical water staining on floor

Example of typical water staining on ceiling

Example of typical water staining on ceiling

Recently converted weight room

Example of water damaged ceiling tiles that have been painted

Building Exterior – West Elevation

Building Exterior – West Elevation

Building Exterior – West Elevation

Building Exterior – West Elevation

Building Exterior – West Elevation

Building Exterior – South Elevation

Building Exterior – East Elevation

Building Exterior – East Elevation

Building Exterior – East Elevation

Building Exterior – East Elevation

Building Exterior – North Elevation