Indoor Environmental Quality Sampling and Analysis Report

Site:
Wiley Elementary School
1602 S. Anderson Street
Urbana, Illinois 61801

Client:
Urbana S.D. 116
205 N. Race Street
Urbana, Illinois 61801

Sample Collection Date:
March 20, 2017

Ideal Number:
20810

IDEAL
ENVIRONMENTAL
ENGINEERING, INC.

Urbana S.D. 116
Wiley Elementary School
1602 S. Anderson Street
Urbana, IL 61801
March 20, 2017
IDEAL Number 20810

Indoor Environmental Quality Sampling and Analysis

INTRODUCTION

Ideal Environmental Engineering (IDEAL) performed limited Indoor Environmental Quality (IEQ) sampling for Urbana S.D. 116 at Wiley Elementary School, 1602 S. Anderson Street in Urbana, IL. Samples were collected by Ann M. Skeate on March 20, 2017, in various locations as noted below. The microbiological analysis was performed by EMLAB P&K, a TestAmerica Company.

PURPOSE

Airborne sampling was performed to determine the presence of any indoor mold spores, to identify and provide brief characteristics of such molds, and to compare levels of any indoor mold spores with the levels found in the naturally-occurring outdoor environment.

SAMPLING LOCATION

Sample locations were selected in a collaborative effort between Ann M. Skeate, IEQ Professional and Mr. Ota Dossett, Director of Facilities.

Two (2) air samples were collected. One (1) air sample was collected from the outside to represent the naturally-occurring environment. One (1) air sample was collected from the following area inside the building:

- Sample 01: Room 28

SITE CONDITIONS

A walk-through of the sampling locations was performed to identify the current conditions. A systematic assessment of each sampling environment included notations of the temperature, humidity, presence of HVAC system (or lack thereof), and a description of the ceilings, walls, and flooring materials are typically recorded. When noted below, a moisture testing device was used to denote the moisture content of materials, which in normal conditions is expected to be at levels less than 25%, except for concrete and hard flooring materials with underlying concrete. The presence of visible suspect mold (or lack thereof) was recorded. In addition, other site conditions may be noted, such as unusual odors or past water intrusion situations.

Room 28 had a temperature of 73.4°F with a relative humidity of 42%. A heating and air conditioning system was present but not in use. The interior walls were block with no visible signs of suspect mold or water damage. The moisture reading was 6.2%. The ceiling was ceiling tiles with no visible signs of suspect mold or water damage. The moisture reading showed no moisture. The flooring was floor tile with no visible signs of suspect mold or water damage. The moisture reading was 18.2%. There was visible suspect surface mold on the desks stacked in the room. There were also several cardboard boxes in the room. Doors and windows were closed.

The outside temperature was 68°F with relative humidity of 50%.

SAMPLING METHODOLOGY

At the onset of the sampling, the reasons and objectives for the sampling are discussed with the client. Surface, bulk, or airborne samples may be collected. The type of samples collected and testing methods chosen are based on the purpose of the sampling event.

Airborne sample locations are selected at random to provide baseline for future comparison purposes and/or at specific locations of concern. Air sample(s) are collected using a high-volume air pump and spore trap air cassettes. The pump is calibrated by the technician to draw air into the cassette at the manufacturer's recommended rate, typically 15 liters per minute. The pump runs for up to 10 minutes per air sample cassette. The amount of time is based on the specific sampling environment. Each cassette is identified with a sample number. A chain of custody is prepared to document the handling of the sample(s). Samples are shipped to a laboratory and analyzed. Industry-standard microbiological sampling techniques and analysis methods are used.

Surface sample locations are selected where mold is readily visible or where the surface of a material is suspected to contain mold. Appropriate sampling media is used. Surface area samples are collected with the sampling media. The size of a surface area is based on the quantity of visible or suspected mold present. Sample is identified with a sample number. A chain of custody is prepared to document the handling of the sample(s). Samples are shipped to a laboratory and analyzed. Industry-standard microbiological sampling techniques and analysis methods are used.

Bulk sample locations are selected where mold is readily visible or is suspected to be present in/on a specific material, such as insulation, ceiling tile or carpet. Appropriate sampling tools are used. A small portion of each material to test is collected and placed into its own sample bag. Sample is identified with a sample number. A chain of custody is prepared to document the handling of the sample(s). Samples are shipped to a laboratory and analyzed. Industry-standard microbiological sampling techniques and analysis methods are used.

SAMPLE ANALYSIS DATA

Airborne samples

The air collected in the spore trap media is analyzed by non-cultured techniques. Non-cultured testing identifies the presence of mold. The methodology is quantitative. Quantitative spore trap analysis includes identification to genus or group of all fungi present, quantification to spores/m3, and a general assessment of background debris.

The airborne samples were submitted for non-cultured quantitative analysis.

Surface and/or Bulk Samples

The surface substance and/or bulk material collected is analyzed by non-cultured techniques. Non-cultured testing identifies the presence of mold. The methodology is qualitative direct analysis. Qualitative direct includes a determination of whether spores present are indicative of mold growth or simply a mix of spores coming in from the outside (normal fallout). If mold growth is present, analysis includes identification to genus or group and a qualitative assessment of the amounts present. A general assessment of non-biological debris and other relevant commentary are also included. No surface or bulk samples were collected.

SAMPLE ANALYSIS INTERPRETATION GUIDELINES

Several distinguished IEQ associations and health departments have established guidelines for sampling and interpreting sample analysis results.

Air Samples

The commonly recognized interpretation is that one can expect to find airborne mold spores in a naturally ventilated indoor environment. Generally, the individual mold genera/species are expected to be similar to those found outside and to be present at levels generally equal to or less than the levels found outside.

Surface and/or Bulk Samples

The commonly recognized interpretation is that one would not expect to find any mold on surface or bulk samples. If mold is found on a surface or bulk sample, the mold genera/species are not expected to differ from the mold genera/species found in an outside air sample.

SUMMARY OF SAMPLING RESULTS

Air samples

The indoor sample contained the following mold genera/species, as identified, which exceeded the levels found in the outside sample:

- Penicilium/Aspergillus

Penicillium/Aspergillus types are commonly found in nature in soil, on plant debris, compost piles, fruit rot, in indoor air and in house dust. It typically grows in water damaged buildings on wallpaper, wallpaper glue, decaying fabrics, moist chipboards, and behind paint.

RECOMMENDATIONS

Corrective measures should be taken, and then the area should be monitored to help ensure the ambient air remains stable and conditions do not change to encourage amplification of fungi.

- Wipe down all walls, desks, chairs and tables in the room with a microbial detergent.
- Remove and discard all excess cardboard and paper products not needed.
- Maintain a regular cleaning schedule, including all ventilation systems, dehumidifiers, humidifiers and air ionizing machines.
- Ensure air filters are working properly on all HVAC system equipment.
- Dry and thoroughly clean any carpets, rugs, fabrics, etc. that get wet within 24 to 48 hours to prevent the growth of fungi.
- Maintain humidity and moisture levels in the building between 35% and 60%.
- Keep indoor temperatures consistent to help prevent mold from growing and spores from spreading.
- Prohibit displays, maintaining, or promoting the use of live plants in this indoor environment. Live plants are allergens to some individuals. The soil in live plants harbor microbial growth and can cause sensitivities, allergic reactions, and respiratory ailments in some individuals.
- Perform follow-up after recommendations to re-evaluate conditions.

GENERAL COMMENTS

No state or federal laws are in effect which regulate indoor environmental quality sampling, testing and remediation. Agencies have acknowledged the serious health effects of a poor indoor air environment. IEQ associations and government agencies have published sampling, testing and remediation guidelines. Details and characteristics of a specific mold may differ from one organization, laboratory or environmental group to the other.

Recommendations provided by IDEAL are recommendations only. Employees of IDEAL are not healthcare providers licensed or trained to provide medical diagnosis, care, or advice. No opinions or recommendations are stated about possible health effects of mold genera/species. The client should consult a medical doctor/toxicologist for effects of mold on humans.

Assessments and testing are performed by personnel trained in indoor environmental quality issues and sampling techniques. The sampling performed during this sampling event is limited. Many types of sampling media, sample collection and analysis methods are available to determine indoor constituents. A variety of sampling methods may be necessary to offset the limitations of each individual sampling method. In order to

help provide valid data, building owners need to report atypical occurrences which could contribute to abnormal building activity (i.e. upcoming or recent demolition or renovations, roof leaks, plumbing or sewage problems, water invasion, acts of God, etc.).

The recording of site conditions is limited. Readily identifiable sources of moisture are noted to help to identify moisture sources which may contribute to mold growth. In-depth moisture investigation was not included in the scope of this work.

Sample results reflect the conditions of the area(s) at the time of the sampling event. The sensitivity of microbial growth to environmental changes can cause particle, spore, and other reportable counts to fluctuate quickly (i.e. opening or closing windows or doors, changes in humidity levels, usage of the room, occupancy level, HVAC usage, indoor and outdoor temperature, etc.). Sample results indicate if mold is present or not and shall be used as a guideline and not a permanent quantification.

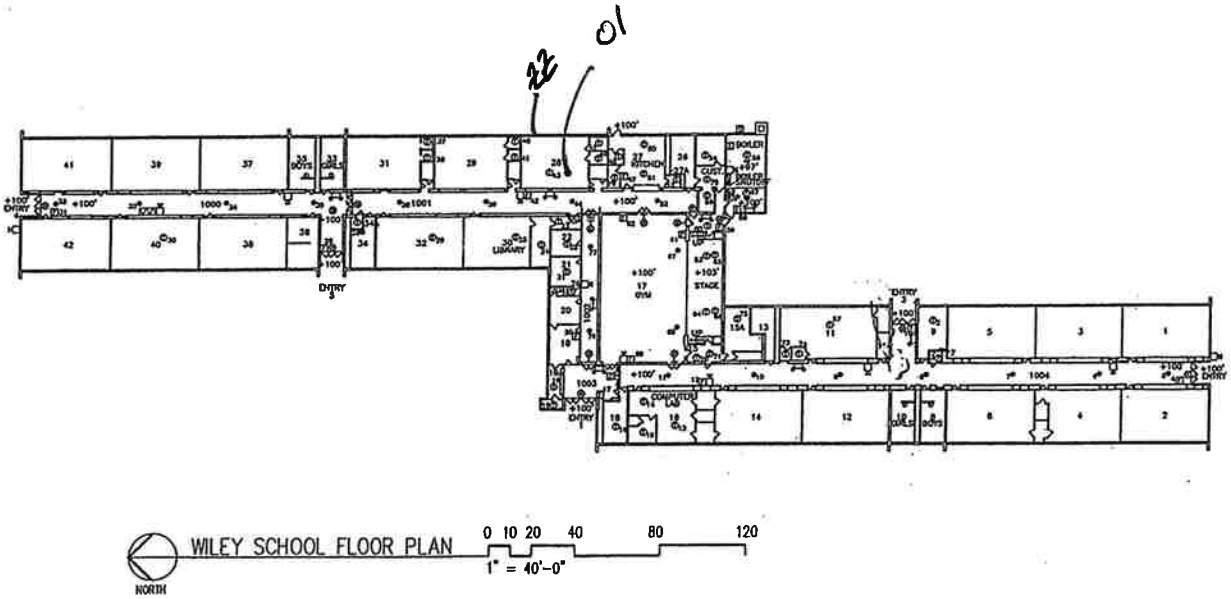
The sampling was non-destructive in nature and was limited to accessible areas only.

The scope of work presented in this report was based on an understanding between IDEAL and client, whether the understanding was from verbal conversation or written document(s). The scope of work and report shall be deemed accepted by client unless client advises to the contrary in writing to IDEAL within 10 days of the report shipping package postmark.

This report shall not be reproduced, except in full, without the written consent of IDEAL.

IDEAL Number:	20810	Client:	Urbana S.D. 116
Location:	Wiley Elementary School	Contact:	Mr. Ota Dossett
Address:	1602 S. Anderson Street Urbana, IL 61801		
Completion Date(s):	March 20, 2017	Diagram Prepared By:	Ann M. Skeate

Description: Indoor Environmental Quality - Sample Locations



EMLab P&K
A TestAmerica Company

Report for:

Ms. Ann Skeate
Ideal Environmental Engineering, Inc.
2904 Tractor Lane
Bloomington, IL 61704

Regarding: Project: 20810-Urbana SD; Wiley Elem. School, 1602 S. Anderson
EML ID: 1696840

Approved by:

[redacted]

Lab Manager
Francina Thadigiri

Dates of Analysis:
Spore trap analysis: 03-21-2017

Service SOPs: Spore trap analysis (EM-MY-S-1038)
AIHA-LAP, LLC accredited service, Lab ID #176641

All samples were received in acceptable condition unless noted in the Report Comments portion in the body of the report. Due to the nature of the analyses performed, field blank correction of results is not applied. The results relate only to the items tested.

EMLab P&K ("the Company") shall have no liability to the client or the client's customer with respect to decisions or recommendations made, actions taken or courses of conduct implemented by either the client or the client's customer as a result of or based upon the Test Results. In no event shall the Company be liable to the client with respect to the Test Results except for the Company's own willful misconduct or gross negligence nor shall the Company be liable for incidental or consequential damages or lost profits or revenues to the fullest extent such liability may be disclaimed by law, even if the Company has been advised of the possibility of such damages, lost profits or lost revenues. In no event shall the Company's liability with respect to the Test Results exceed the amount paid to the Company by the client therefor.

EMLab P&K's LabServe® reporting system includes automated fail-safes to ensure that all AIHA-LAP, LLC quality requirements are met and notifications are added to reports when any quality steps remain pending.

EMLab P&K
1815 West Diehl Road, Suite 800, Naperville, IL 60563
(866) 871-1984 Fax (856) 334-1040 www.emlab.com

Client: Ideal Environmental Engineering, Inc.
C/O: Ms. Ann Skeate
Re: 20810-Urbana SD; Wiley Elem. School, 1602 S. Anderson

Date of Sampling: 03-20-2017
Date of Receipt: 03-21-2017
Date of Report: 03-21-2017

SPORE TRAP REPORT: NON-VIABLE METHODOLOGY

Location:	01: Rm 28		ZZ: Outside Rm 28	
Comments (see below)	None		A	
Lab ID-Version‡:	7907047-1		7907048-1	
Analysis Date:	03/21/2017		03/21/2017	
	raw ct.	spores/m3	raw ct.	spores/m3
Alternaria			10	67
Ascospores			14	370
Basidiospores	1	7	64	1,700
Chaetomium				
Cladosporium	7	47	31	670
Epicoccum	1	7	5	33
Myrothecium				
Nigrospora			4	27
Other brown			2	13
Other colorless				
Penicillium/Aspergillus types†	292	7,800		
Pithomyces				
Pyricularia			1	7
Rusts			1	7
Smuts, Periconia, Myxomycetes	1	7	8	53
Stachybotrys				
Stemphylium				
Torula	1	7	5	33
Ulocladium				
Zygomycetes				
Background debris (1-4+)††	2+		2+	
Hyphal fragments/m3	7		40	
Pollen/m3	< 7		690	
Skin cells (1-4+)	2+		< 1+	
Sample volume (liters)	150		150	
§ TOTAL SPORES/m3		7,900		3,000

Comments: A) 8 of the raw count *Cladosporium* spores were present as a single clump.

Spore types listed without a count or data entry were not detected during the course of the analysis for the respective sample, indicating a raw count of <1 spore.
† The spores of *Aspergillus* and *Penicillium* (and others such as *Acremonium, Paecilomyces*) are small and round with very few distinguishing characteristics. They cannot be differentiated by non-viable sampling methods. Also, some species with very small spores are easily missed, and may be undercounted.
††Background debris indicates the amount of non-biological particulate matter present on the trace (dust in the air) and the resulting visibility for the analyst. It is rated from 1+ (low) to 4+ (high). Counts from areas with 4+ background debris should be regarded as minimal counts and may be higher than reported. It is important to account for samples volumes when evaluating dust levels.

The analytical sensitivity is the spores/m^3 divided by the raw count, expressed in spores/m^3. The limit of detection is the analytical sensitivity (in spores/m^3) multiplied by the sample volume (in liters) divided by 1000 liters.

For more information regarding analytical sensitivity, please contact QA by calling the laboratory.
‡ A "Version" indicated by -"x" after the Lab ID# with a value greater than 1 indicates a sample with amended data. The revision number is reflected by the value of "x".
§ Total Spores/m3 has been rounded to two significant figures to reflect analytical precision.

EMLab P&K
1815 West Diehl Road, Suite 800, Naperville, IL 60563
(866) 871-1984 Fax (856) 334-1040 www.emlab.com

Client: Ideal Environmental Engineering, Inc.
C/O: Ms. Ann Skeate
Re: 20810-Urbana SD; Wiley Elem. School, 1602 S. Anderson

Date of Sampling: 03-20-2017
Date of Receipt: 03-21-2017
Date of Report: 03-21-2017

MoldRANGE™, Local Climate; Extended Outdoor Comparison

Outdoor Location: ZZ, Outside Rm 28

Fungi Identified	Outdoor data	Typical Outdoor Data for: March in Illinois† EMLab Local Climate code[1] B Annual Temp, B Elev., A Rain, B Temp. Range (n‡=20)						Typical Outdoor Data for: The entire year in Illinois† EMLab Local Climate code[1] B Annual Temp, B Elev., A Rain, B Temp. Range (n‡=185)					
Project zip code 61801	spores/m3	very low	low	med	high	very high	freq %	very low	low	med	high	very high	freq %
Generally able to grow indoors*													
Alternaria	67	-	-	-	-	-	30	9	13	67	230	480	69
Bipolaris/Drechslera group	-	-	-	-	-	-	< 5	-	-	-	-	-	9
Chaetomium	-	-	-	-	-	-	< 5	-	-	-	-	-	4
Cladosporium	670	-	-	-	-	-	55	110	310	900	4,300	11,000	90
Curvularia	-	-	-	-	-	-	5	7	7	13	20	48	15
Epicoccum	33	-	-	-	-	-	30	7	13	27	180	290	56
Nigrospora	27	-	-	-	-	-	15	7	13	27	170	300	30
Other brown	13	-	-	-	-	-	15	7	7	13	27	33	17
Penicillium/Aspergillus types	-	-	-	-	-	-	40	27	53	100	320	680	46
Stachybotrys	-	-	-	-	-	-	5	-	-	-	-	-	< 1
Torula	33	-	-	-	-	-	5	-	-	-	-	-	10
Seldom found growing indoors**													
Ascospores	370	-	-	-	-	-	45	53	110	360	1,600	2,900	79
Basidiospores	1,700	-	-	-	-	-	65	53	110	770	3,400	5,300	89
Pyricularia	7	-	-	-	-	-	< 5	-	-	-	-	-	2
Rusts	7	-	-	-	-	-	10	7	7	13	53	73	29
Smuts, Periconia, Myxomycetes	53	-	-	-	-	-	20	7	13	40	100	170	59
§ TOTAL SPORES/m3	3,000												

[1]EMLab Local Climate codes are a climate classification scheme for statewide geographic areas. The MoldRANGE™ Local Climate report uses the sampling location zip code to identify the EMLab Local Climate code in that area. Using information available from the NOAA weather database, the EMLab Local Climate code sharpens the precision of the MoldRANGE™reporting system, providing more reliable estimates of the range and average concentrations of the different airborne fungal spore types for each region. Additional information on the EMLab Local Climate code system can be found on the last page of this report.

†The Typical Outdoor Data represents the typical outdoor spore levels across the state for the time period and EMLab Local Climate code indicated. The last column represents the frequency of occurrence. The very low, low, med, high, and very high values represent the 10, 20, 50, 80, and 90 percentile values of the spore type when it is detected. For example, if the frequency of occurrence is 63% and the low value is 53, it would mean that the given spore type is detected 63% of the time and, when detected, 20% of the time it is present in levels above the detection limit and below 53 spores/m3. These values are updated periodically and if not enough data is available to make a statistically meaningful assessment, it is indicated with a dash.

‡ n is the sample size used to calculate the MoldRANGE™ Local Climate data summarized in the table.

* The spores in this category are generally capable of growing on wet building materials in addition to growing outdoors. Building related growth is dependent upon the fungal type, moisture level, type of material, and other factors. *Cladosporium* is one of the predominant spore types worldwide and is frequently present in high numbers. *Penicillium/Aspergillus* species colonize both outdoor and indoor wet surfaces rapidly and are very easily dispersed. Other genera are usually present in lesser numbers.

** These fungi are generally not found growing on wet building materials. For example, the rusts and smuts are obligate plant pathogens. However, in each group there are notable exceptions. For example, agents of wood decay are members of the basidiomycetes and high counts of a single morphological type of basidiospore on an inside sample should be considered significant.

§ Total Spores/m3 has been rounded to two significant figures to reflect analytical precision.

EMLab P&K
1815 West Diehl Road, Suite 800, Naperville, IL 60563
(866) 871-1984 Fax (856) 334-1040 www.emlab.com

Client: Ideal Environmental Engineering, Inc.
C/O: Ms. Ann Skeate
Re: 20810-Urbana SD; Wiley Elem. School, 1602 S. Anderson

Date of Sampling: 03-20-2017
Date of Receipt: 03-21-2017
Date of Report: 03-21-2017

Understanding EMLab Local Climate Codes

Outdoor airborne spore concentrations are strongly influenced by climate and weather patterns, often resulting in pronounced seasonal and diurnal cycles (Burge 1995). The seasonal climatic changes directly affect the growth cycle of plants, thereby influencing fungal growth, spore maturation, and release cycles. By evaluating outdoor spore concentrations across similar climatic zones rather than for the state as a whole, it is possible to provide a more representative estimate of typical outdoor spore levels and frequency of occurrence for different airborne fungal spore types in a given area.

The EMLab Local Climate code system is a novel and patent pending classification system that uses data from the NOAA - National Oceanic and Atmospheric Administration database to define unique climate regions by state. The following local climate variables, for each statewide zip code, are obtained from NOAA and assigned a letter code of A (above the statewide average for that variable) or B (below the statewide average for that variable):

1. Annual High Temperature
2. Elevation
3. Rainfall/Precipitation
4. Monthly Temperature Range

The result is a 4-character code assigned to each statewide zip code, referred to as the Local Climate Code. Below are some examples of decoded Local Climate Codes:

AAAA = Above avg. Annual High Temperature, Above avg. Elevation, Above avg. Rainfall/Precipitation, Above avg. Monthly Temperature Range
AABB = Above avg. Annual High Temperature, Above avg. Elevation, Below avg. Rainfall/Precipitation, Below avg. Monthly Temperature Range
BBAA = Below avg. Annual High Temperature, Below avg. Elevation, Above avg. Rainfall/Precipitation, Above avg. Monthly Temperature Range

The actual outdoor air sample data from matching local climate codes in each state are then compiled in a manner relating typical spore concentrations and frequency of occurrence.

The NOAA local climate variables were selected by mapping data points from a subset of approximately 145,000 weather and geographic database entries to over 80,000 outdoor spore trap samples with known zip codes and assessing them using orthogonal array experimental design techniques. The results were then compared to the typical ranges of spore types found when grouping zip codes using the Koppen-Geiger climatic classification system; a commonly used climatic system that provides an objective numerical definition in terms of climatic elements such as temperature, rainfall, and other seasonal characteristics . The EMLab Local Climate codes showed improved granularity and refinement of the zip code groupings, implying a better representation of the expected range of spore types to be found within an individual zip code.

The values on this report were calculated by obtaining the four variables listed above from the over 585 million data points of weather and geographic information available in the NOAA database, and determining the frequencies and percentile values of spore types by utilizing over 180,000 EMLab P&K outdoor spore trap samples with known zip codes.

This report groups statewide zip codes in relation to these EMLab Local Climate codes and summarizes MoldRANGE™ data by month and year within each EMLab Local Climate code.

References:
Burge, Harriet, A. Bioaerosols: Boca Raton: Lewis Publishers, pp. 163-171, 1995.

EMLab P&K
1815 West Diehl Road, Suite 800, Naperville, IL 60563
(866) 871-1984 Fax (856) 334-1040 www.emlab.com

Client: Ideal Environmental Engineering, Inc.
C/O: Ms. Ann Skeate
Re: 20810-Urbana SD; Wiley Elem. School, 1602 S. Anderson

Date of Sampling: 03-20-2017
Date of Receipt: 03-21-2017
Date of Report: 03-21-2017

MoldSTAT™: Supplementary Statistical Spore Trap Report

Outdoor Summary: ZZ: Outside Rm 28

Species detected	Outdoor sample spores/m3 (<100 / 1K / 10K / >100K)	Typical outdoor ranges (North America)	Freq. %
Alternaria	67	7 - 35 - 530	44
Ascospores	370	13 - 210 - 6,400	77
Basidiospores	1,700	13 - 440 - 24,000	91
Cladosporium	670	27 - 480 - 9,800	90
Epicoccum	33	7 - 27 - 360	24
Nigrospora	27	7 - 17 - 270	17
Other brown	13	7 - 20 - 130	25
Penicillium/Aspergillus types	< 7	13 - 170 - 2,600	67
Pyricularia	7	7 - 13 - 300	4
Rusts	7	7 - 25 - 370	19
Smuts, Periconia, Myxomycetes	53	7 - 53 - 910	64
Torula	33	7 - 13 - 170	9
Total	3,000		

The "Typical outdoor ranges" and "Freq. %" columns show the typical low, medium, and high spore counts per cubic meter and the frequency of occurrence for the given spore type. The low, medium, and high values represent the 2.5, 50, and 97.5 percentile values when the spore type is detected. For example, if the low value is 53 and the frequency of occurence is 63%, it would mean that we typically detect the given spore type on 63 percent of all outdoor samples and, when detected, 2.5% of the time it is present in levels below 53 spores/m3.

Indoor Samples

Location: 01: Rm 28

% of outdoor total spores/m3	Friedman chi-square* (indoor variation)	Agreement ratio** (indoor/outdoor)	Spearman rank correlation*** (indoor/outdoor)	MoldSCORE**** (indoor/outdoor)
Result: 264%	dF: N/A Result: N/A Critical value: N/A Inside Similar: N/A	Result: 0.5882	dF: 12 Result: 0.2360 Critical value: 0.4965 Outside Similar: No	Score: 300 Result: High

Species Detected	Spores/m3 (<100 / 1K / 10K / >100K)
Basidiospores	7
Cladosporium	47
Epicoccum	7
Penicillium/Aspergillus types	7,800
Smuts, Periconia, Myxomycetes	7
Torula	7
Total	7,900

EMLab P&K
1815 West Diehl Road, Suite 800, Naperville, IL 60563
(866) 871-1984 Fax (856) 334-1040 www.emlab.com

Client: Ideal Environmental Engineering, Inc.
C/O: Ms. Ann Skeate
Re: 20810-Urbana SD; Wiley Elem. School, 1602 S. Anderson

Date of Sampling: 03-20-2017
Date of Receipt: 03-21-2017
Date of Report: 03-21-2017

MoldSTAT™: Supplementary Statistical Spore Trap Report

* The Friedman chi-square statistic is a non-parametric test that examines variation in a set of data (in this case, all indoor spore counts). The null hypothesis (H0) being tested is that there is no meaningful difference in the data for all indoor locations. The alternative hypothesis (used if the test disproves the null hypothesis) is that there is a difference between the indoor locations. The null hypothesis is rejected when the result of the test is greater than the critical value. The critical value that is displayed is based on the degrees of freedom (dF) of the test and a significance level of 0.05.

** An agreement ratio is a simple method for assessing the similarity of two samples (in this case the indoor sample and the outdoor summary) based on the spore types present. A score of one indicates that the types detected in one location are the same as that in the other. A score of zero indicates that none of the types detected indoors are present outdoors. Typically, an agreement of 0.8 or higher is considered high.

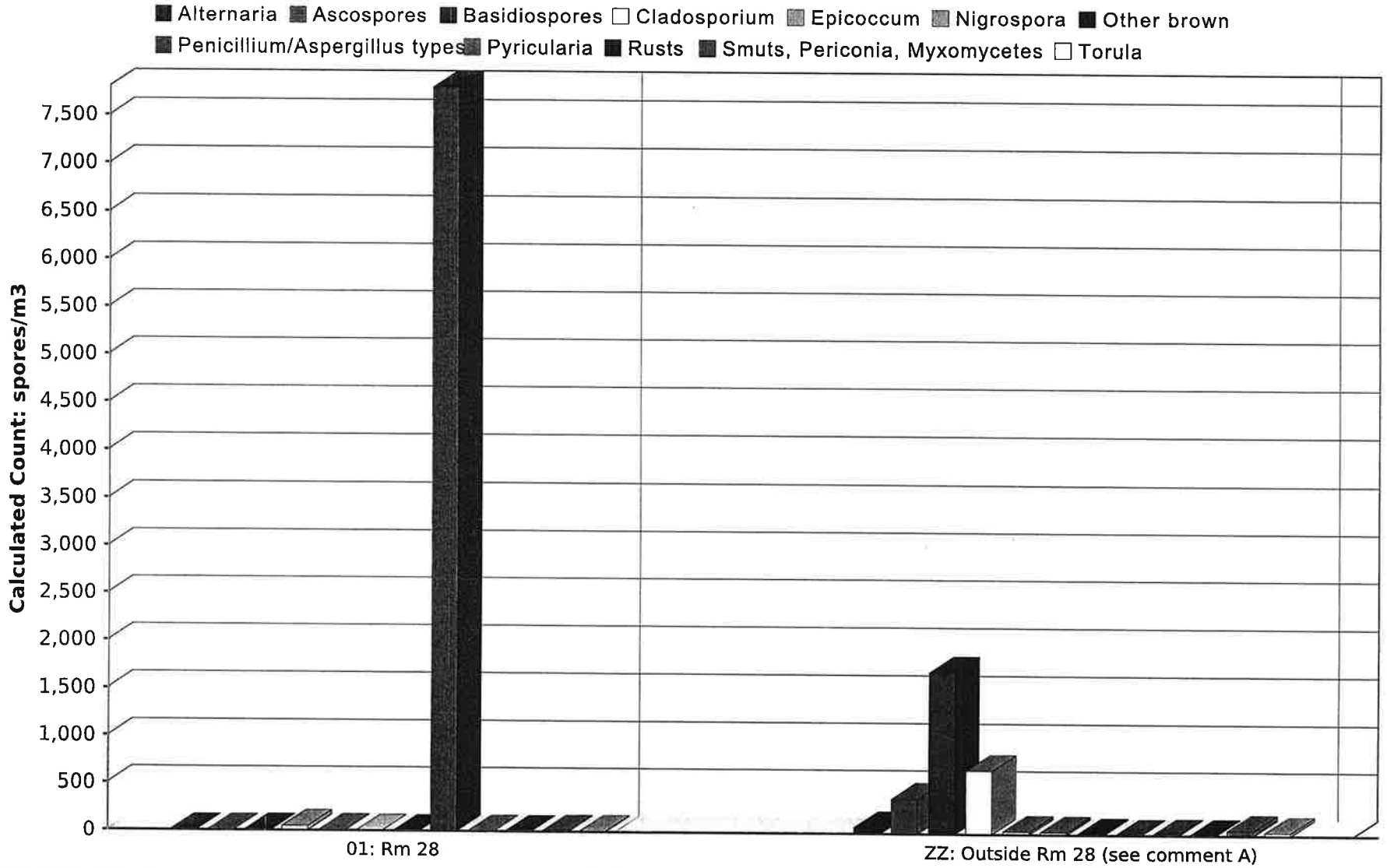
*** The Spearman rank correlation is a non-parametric test that examines correlation between two sets of data (in this case the indoor location and the outdoor summary). The null hypothesis (H0) being tested is that the indoor and outdoor samples are unrelated. The alternative hypothesis (used if the test disproves the null hypothesis) is that the samples are similar. The null hypothesis is rejected when the result of the test is greater than the critical value. The critical value that is displayed is based on the degrees of freedom (dF) of the test and a significance level of 0.05.

**** MoldSCORE™ is a specialized method for examining air sampling data. It is a score between 100 and 300, with 100 indicating a greater likelihood that the airborne indoor spores originated from the outside, and 300 indicating a greater likelihood that they originated from an inside source. The Result displayed is based on the numeric score given and will be either Low, Medium, or High, indicating a low, medium, or high likelihood that the spores detected originated from an indoor source. EMLab P&Kreserves the right to, and may at anytime, modify or change the MoldScore algorithm without notice.

Interpretation of the data contained in this report is left to the client or the persons who conducted the field work. This report is provided for informational and comparative purposes only and should not be relied upon for any other purpose. "Typical outdoor ranges" are based on the results of the analysis of samples delivered to and analyzed by EMLab P&K and assumptions regarding the origins of those samples. Sampling techniques, contaminants infecting samples, unrepresentative samples and other similar or dissimilar factors may affect these results. With the statistical analysis provided, as with all statistical comparisons and analyses, false-positive and false-negative results can and do occur. EMLab P&K hereby disclaims any liability for any and all direct, indirect, punitive, incidental, special or consequential damages arising out of the data contained in, or any actions taken or omitted in reliance upon, this report.

EMLab P&K
1815 West Diehl Road, Suite 800, Naperville, IL 60563
(866) 871-1984 Fax (856) 334-1040 www.emlab.com

SPORE TRAP REPORT: NON-VIABLE METHODOLOGY



Comments: A) 8 of the raw count *Cladosporium* spores were present as a single clump.

Note: Graphical output may understate the importance of certain "marker" genera.
EMLab P&K, LLC

CHAIN OF CUSTODY

www.EMLabPK.com

EMLab P&K — A TestAmerica Company

New Jersey: 3000 Lincoln Drive East, Suite A, Marlton, NJ 08053 * (866) 871-1984
Phoenix, AZ: 1501 West Knudsen drive, Phoenix, AZ 85027 * (800) 651-4802
SSF, CA: 6000 Shoreline Court, Suite 205, South San Francisco, CA 94080 * (866) 888-6653

Weather / Level	Fog	Rain	Snow	Wind	Clear
None	☑	☑	☑	☐	☐
Light	☐	☐	☐	☑	
Moderate	☐	☐	☐	☑	
Heavy	☐	☐	☐	☐	

001696840

CONTACT INFORMATION

Company:	Ideal Environmental Engineering, Inc. (10168)	Address: 2904 Tractor Lane Bloomington, IL 61704 USA
Contact:	Ms. Ann Skeate	Special Instructions: email results to askeate@idealenvironmental.com
Phone:	309-828-4259	

PROJECT INFORMATION

Project ID:	20810-Urbana SD		
Project Description:	Wiley Elem. School 1602 S. Anderson		
Project Zip Code:	61801	Sampling Date & Time:	3/20/17
PO Number:	20810	Sampled By:	Ann Skeate

TURN AROUND TIME CODES (TAT)

- STD – Standard (DEFAULT)
- ND – Next Business Day
- SD – Same Business Day Rush
- WH – Weekend / Holiday

Rushes received after 2 pm or on weekends, will be considered received the next business day. Please alert us in advance of weekend analysis needs.

REQUESTED SERVICES (Use checkboxes)

Non-Culturable: Spore Trap; Tape Swab Bulk. Culturable: BioCassette™, Andersen, Water, Bulk, Dust, Soil, ...

Sample ID	Description	Sample Type (Below)	TAT (Above)	Total Volume / Area (as applicable)	Notes (Time of day, Temp, RH, etc.)	Fungi – Spore Trap Analysis
01	Rm. 28	ST	SD	150	2:50 p [illegible] 72%	☑
22	Outside Rm 28	↓	↓	↓	↓ 68° 50%	☑

Other requested service columns (none checked): Spore Trap Analysis – Other particles; Direct Microscopic Exam (Qualitative); Quantitative Spore Count Direct Exam; 1-Media Surface Fungi (Genus ID + Asp. spp.); 2-Media Surface Fungi (Genus ID + Asp. spp.); 3-Media Surface Fungi (Genus ID + Asp. spp.); Culturable Air Fungi (Genus ID + Asp. spp.); Gram Stain & Counts (Culturable Air & Surface Bacteria); Legionella culture; Total Coliform, E. coli (Presence/Absence); Membrane Filtration (specify organism); MPN Bacteria (specify organism); QuantiTray – Sewage Screen; Asbestos Analysis – PCM Airborne Fiber Count (NIOSH 7400); Asbestos Analysis – PLM (EPA method 600R-93-116); PCR (specify test)

#20810

SAMPLE TYPE CODES

BC – BioCassette™	ST – Spore Trap: Zefon, Allergenco, Burkard ...	T – Tape	D – Dust
A18 – Andersen		SW – Swab	SO – Soil
SAS – Surface Air Sampler	P – Potable Water	B – Bulk	
CP – Contact Plate	NP – Non-Potable Water	O – Other:	

RELINQUISHED BY	DATE & TIME	RECEIVED BY	DATE & TIME
[redacted]	3/20/17 3p	[redacted]	3/21/17 8:55

Certificate of Completion

This is to certify that

Ann Skeate

has successfully completed a 3-hour webinar on

Strategies for Mold Investigations and Sampling

We will ensure that IAQ industry professionals succeed on their quest for knowledge.

Date: Tuesday, August 2, 2016

A TestAmerica Company

David F. Gallup
Co-Founder, EMLab P&K

Dr. Harriet Burge
Director of Aerobiology, EMLab P&K

Certificate of Completion

This is to certify that

Ann Skeate

has successfully completed a 3-hour webinar on

Strategies for Mold Investigations and Sampling

We will ensure that IAQ industry professionals succeed on their quest for knowledge.

Date: Wednesday, September 10, 2014

A TestAmerica Company

EMLAB P&K THE PROVEN LEADER

David F. Gallup
Co-Founder, EMLab P&K

Dr. Harriet Burge
Director of Aerobiology, EMLab P&K

Certificate of Completion

This is to certify that

Ann Skeate

has successfully completed a 3-hour webinar on

Strategies for Mold Investigations and Sampling

We will ensure that IAQ industry professionals succeed on their quest for knowledge.

Date: Tuesday, January 28, 2014

A TestAmerica Company

David F. Gallup
Co-Founder, EMLab P&K

Dr. Harriet Burge
Director of Aerobiology, EMLab P&K

Certificate of Completion

This is to certify that

EMLAB P&K

Ann Skeate

has successfully completed a 3 hour webinar on

Strategies for Mold Investigations and Sampling

THE PROVEN LEADER®

We will ensure that IAQ industry professionals succeed on their quest for knowledge.

Date: Wednesday, September 4, 2013

A TestAmerica Company

D Gallup

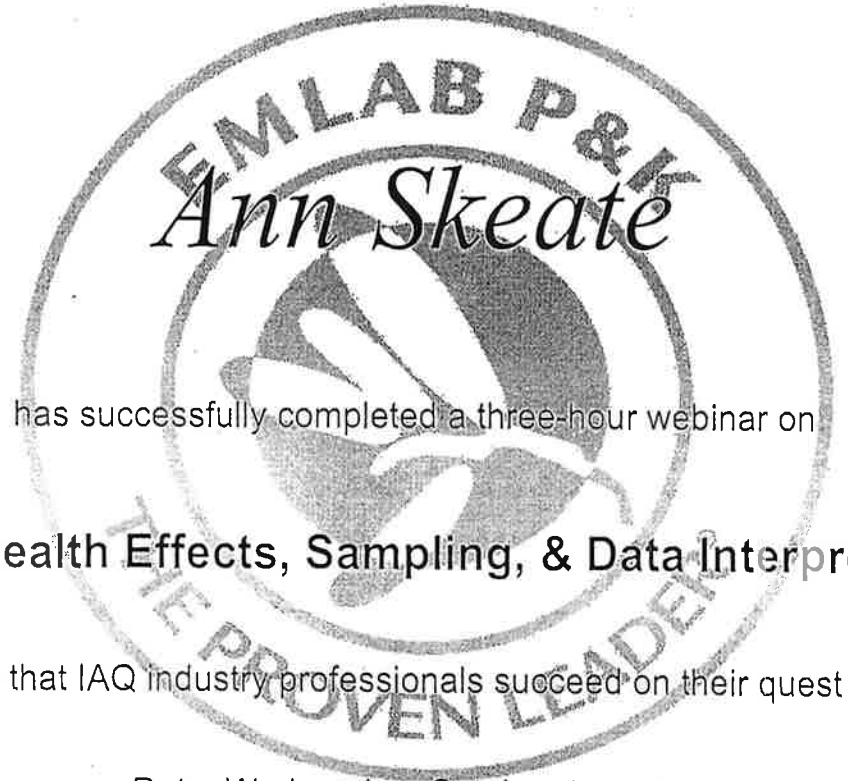
David F. Gallup
Co-Founder, EMLab P&K

Harriet Burge

Dr. Harriet Burge
Director of Aerobiology, EMLab P&K

Certificate of Completion

This is to certify that



Ann Skeate

has successfully completed a three-hour webinar on

Mold: Health Effects, Sampling, & Data Interpretation

We will ensure that IAQ industry professionals succeed on their quest for knowledge.

Date: Wednesday, October 17, 2012

A TestAmerica Company

David F. Gallup
Co-Founder, EMLab P&K

Dr. Harriet Burge
Director of Aerobiology, EMLab P&K

This certifies that on September 15-17, 2004

Ann Skeate

Successfully completed QuanTEM Laboratories' three day Mold Investigator Training Course in Springfield, Illinois

Proficiency was demonstrated by classroom participation and passing a written exam.

This course has been awarded 3 CM Points by the American Board of Industrial Hygiene.

John E. Barnett
President

Terry Harrison
Director of Microbiology

Jeff Mlekush
Laboratory Director

Certificate of Attendance

This is to certify that

Ann Skeate

has attended QuanTEM Laboratories' Mold Investigator Training Course held September 15-17, 2004 in Springfield, Illinois. This training course included more than 20 hours of educational content and has been awarded 3 Certification Maintenance Points by the American Board of Industrial Hygiene.

John E. Barnett, President

EMSL ANALYTICAL, INC.

Certifies that

Ann Skeate

Has completed 8 hours of training covering Advanced Fungal Workshop

Advanced Fungal Workshop

Credits and Continuing Education:

ACAC – 8 Credits
ABIH – 1.09 IH CM Points
BCSP - 0.50 CEUs
IICRC - 1 Credit
BOMI - 8CPD

EMSL Certificate No. 70013864

Course Date: 11/03/2010

Granted: 11/03/2010

Sponsored by:

EMSL Analytical, Inc.
200 Route 130 North
Cinnaminson, NJ 08077
Phone: (800) 220-3675
Fax: (856) 786-5973
www.emsl.com

EMSL ANALYTICAL INC.

Jason Dobranic, Ph.D.

National Director of Microbiology

Environmental, Mold, Bacteria, IAQ, Asbestos, Lead, Forensic and Materials Testing Since 1981

Certificate of Completion

THIS IS TO CERTIFY THAT

Ann Skeate

HAS SUCCESSFULLY COMPLETED A ONE-DAY SEMINAR ON

Mold, Bacteria, Asbestos, Radon, Industrial Hygiene Sampling Techniques & Data Interpretation

We will ensure that IAQ industry professional succeed on their quest for knowledge.

Belinda C. Vega, President
Emlab P&K
Mold University Dean

Class Date: May 1st, 2007
8 Hour Class

Dr. Harriet Burge, Director of Aerobiology
Emlab P&K.

Eligible for Continuing Education Units for:

ABIH (#08-1313) –1 CM point
AmIAQ (8.0 CRCs)
ASHI (2.0 MRCs)
InterNACHI (8.0 CEUs)
NAHI (6.0 CEUs)

CENTER FOR ENVIRONMENTAL TRAINING

SEVERN TRENT LABORATORIES, INC.
P&K MICROBIOLOGY SERVICES, INC. &
HDC ENGINEERING, LLC

CERTIFY THAT

Ann Skeate

Successfully Completed

"Investigating & Assessing Microbiological Contamination in the Indoor Environment"

Mr. Chan Yang, PhD, President, Severn Trent and P&K Microbiology Services, Cherry Hill, NJ
Mr. Douglas Toal, PhD, Technical Director, P&K Microbiology Services, Austin, TX
Mr. Jon Boyter, EE, CIH, Senior Environmental Program Manager, HDC Engineering, Champaign, IL
Mr. James Morrison, MS, CIH, Senior Environmental Consultant, Boelter & Yates, Park Ridge, IL
Jack Barnette, Environmental Scientist, USEPA - Region 5

Certifying Authorities

J. Mike Jones, Principal
HDC Engineering, LLC

Joe D. Walker, Account Executive
Severn Trent Laboratories, Inc.

AIHA Laboratory Accreditation Programs, LLC

acknowledges that

EMLab P&K, LLC.

1815 West Diehl Road Suite #800, Naperville, IL 60563

Laboratory ID: 176641

along with all premises from which key activities are performed, as listed above, has fulfilled the requirements of the AIHA Laboratory Accreditation Programs (AIHA-LAP), LLC accreditation to the ISO/IEC 17025:2005 international standard, *General Requirements for the Competence of Testing and Calibration Laboratories* in the following:

LABORATORY ACCREDITATION PROGRAMS

☐	**INDUSTRIAL HYGIENE**	Accreditation Expires:
☐	**ENVIRONMENTAL LEAD**	Accreditation Expires:
✓	**ENVIRONMENTAL MICROBIOLOGY**	Accreditation Expires: March 01, 2019
☐	**FOOD**	Accreditation Expires:
☐	**UNIQUE SCOPES**	Accreditation Expires:

Specific Field(s) of Testing (FoT)/Method(s) within each Accreditation Program for which the above named laboratory maintains accreditation is outlined on the attached **Scope of Accreditation**. Continued accreditation is contingent upon successful on-going compliance with ISO/IEC 17025:2005 and AIHA-LAP, LLC requirements. This certificate is not valid without the attached **Scope of Accreditation**. Please review the AIHA-LAP, LLC website (www.aihaaccreditedlabs.org) for the most current Scope.

William Walsh, CIH
Chairperson, Analytical Accreditation Board

Cheryl O. Morton
Managing Director, AIHA Laboratory Accreditation Programs, LLC

Revision 15: 03/30/2016

Date Issued: 01/31/2017

AIHA
Laboratory Accreditation Programs, LLC

AIHA Laboratory Accreditation Programs, LLC
SCOPE OF ACCREDITATION

EMLab P&K, LLC.
1815 West Diehl Road Suite #800, Naperville, IL 60563

Laboratory ID: **176641**
Issue Date: 01/31/2017

The laboratory is approved for those specific field(s) of testing/methods listed in the table below. Clients are urged to verify the laboratory's current accreditation status for the particular field(s) of testing/Methods, since these can change due to proficiency status, suspension and/or withdrawal of accreditation.

Environmental Microbiology Laboratory Accreditation Program (EMLAP)

Initial Accreditation Date: 09/01/2005

EMLAP Category	Field of Testing (FoT)	Method	Method Description *(for internal methods only)*
Fungal	Air - Direct Examination	EM-MY-S-1038	Preparation and Analysis of Spore Trap (Air) Samples for Fungal Spores, Other Biological and Non-Biological Particles
	Bulk - Direct Examination	EM-MY-S-1039	Preparation and Analysis of Tape, Swab, Wipe, Bulk and Dust-Soil Samples for Qualitative Direct Microscopic Examination
		EM-MY-S-1041	Preparation and Analysis of Tape, Swab,Wipe, Bulk and Dust-Soil Samples for Quantitative Direct Microscopic Examination
	Surface - Direct Examination	EM-MY-S-1039	Preparation and Analysis of Tape, Swab, Wipe, Bulk and Dust-Soil Samples for Qualitative Direct Microscopic Examination
		EM-MY-S-1041	Preparation and Analysis of Tape, Swab,Wipe, Bulk and Dust-Soil Samples for Quantitative Direct Microscopic Examination
Bacterial	Legionella	EM-BT-S-1045	Detection and Enumeration of Legionella (based on ISO 11731 Method)

A complete listing of currently accredited Environmental Microbiology laboratories is available on the AIHA-LAP, LLC website at: http://www.aihaaccreditedlabs.org

<DATE>

Mr. Ota Dossett, Director of Facilities
Urbana S.D. 116
205 N. Race Street
Urbana, IL 61802

Re: Indoor Environmental Quality Sampling and Analysis
Wiley Elementary School
1602 S. Anderson Street / Urbana, IL 61801
Ideal Numbers 20810 and 20810A

Dear Mr. Dossett:

Thank you for contacting Ideal Environmental Engineering for these projects. A copy of each of the Indoor Environmental Quality Sampling and Analysis Report are enclosed.

If you have questions or need additional assistance, please don't hesitate to call me at 800/535-0964.

Sincerely,

Ann M. Skeate
Engineering Manager

AMS:dms

Enclosures