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December 27, 2010

Mr. John Conlan
North Valley Public Library
208 Main Street
Stevensville, MT 59870

RE: Letter Report
Microbial Air Sampling
North Valley Public Library
208 Main Street
Stevensville, Montana
Northern Industrial Hygiene Project No. 499-446

Dear Mr. Conlan:

At your request, Northern Industrial Hygiene (NIH) performed limited microbial air sampling at the above referenced site on November 11, 2010. The structure inspected is currently used as a Public Library. Our scope of work was limited to microbial air samples and a visual inspection of the two (2) basement areas to determine if microbial growth is occurring in these areas and if so, is it having a negative effect on the air quality on the main floor of the building.

Background and Visual Observations

During the course of the inspection, suspect building materials and locations were examined for evidence of fungal growth, water intrusion, and water damage.

The North Valley Public Library building is a combination of three older buildings and one new addition. The southern most section is identified as the mercantile wing, the center section is the former IGA Grocery Store, the northern section is identified as the Community Room and the new addition is the vestibule and restrooms located between the IGA and Community Room areas. The mercantile wing also contains a second floor. On the eastern most section of the mercantile wing there is an unfinished basement area. An addition basement section can be found beneath the circulation desk of the former IGA Grocery Store. There is a dirt crawl space that is located beneath all three sections.

The basement area beneath the circulation desk has a concrete floor and walls. The columns and floor joists are wood. Microbial growth noted throughout this area on these wood surfaces. There is an old wooden cooler with wood shaving insulation in the walls and ceiling. Some microbial growth was noted on the wood insulation. To the west and at a higher elevation of the basement area is a dirt crawl space. This area has limited access and was not inspected by NIH.

The basement area beneath the Montana Room has a concrete floor and walls with a small section of the wall finished with wood peg board. The crawl space located to the west is dirt and sits at a higher elevation than the basement area. The ceiling is generally unfinished with a small section of the ceiling finished with gypsum board. Microbial growth was observed on a wood crate below the access point to the crawlspace. Microbial growth

was also observed on the concrete wall where a cardboard box had been stored against it. Mold growth was note observed in the crawlspace.

During our inspection the local weather was cold with a light snow. The outside temperature was approximately 29° Fahrenheit with a relative humidity of approximately 53%. The interior temperature of the basement area beneath the Montana Room was approximately 59.1° Fahrenheit with a relative humidity of approximately 44.0%. The interior temperature for the Montana Room was approximately 66.3° Fahrenheit with a relative humidity of approximately 32.8%. The interior temperature for the Mercantile Wing was approximately 69.4° Fahrenheit with a relative humidity of approximately 28.9%.

Sample Methods

The spore trap method of bioaerosol sampling was selected to collect, identify, and enumerate airborne mold spores. The spore trap sampling method entails drawing a known volume of air through an Allergenco D (or similar) cassette, which collects total airborne fungal matter, whether viable, dormant, or non-viable. Airborne particulate entering the cassette inlet impacts on a hexisilicone-coated slide and spores are identified (at least to genus level) and quantified using microscopy. It should be noted that mold spore sampling provides a "picture" of the air specific only to that period of sample collection. Spore counts do not remain constant throughout an area relative to time, but vary depending on a number of factors including time of day, temperature, relative humidity, and any disturbance factors that may aerosolize the spores.

Bioaerosol Background Information

Presently there are no regulations for acceptable levels of indoor microbial (fungal and bacterial spores, viruses, protozoa, etc.) concentrations. Cognizant authorities suggest that indoor airborne microbial counts be similar or reduced in comparison with adjacent outdoor airborne microbial counts. This guideline is based on the assumption that indoor air is introduced into a building from the outdoor environment. Air filters, when installed and maintained properly, function to reduce the total number of particles (including mold spores) entering a structure. Most buildings and homes contain low to moderate background levels of mold spores. Elevated indoor spore counts might suggest that there is a water source available, resulting in the proliferation of mold.

If an elevated concentration of airborne mold spores is detected or if the ratio of indoor to outdoor microbes is greater than 10:1, "amplification," active mold growth may be occurring within a structure from some combination of factors that promotes microbial proliferation. In general, factors enhancing microbial growth include: a source of sufficient moisture or water intrusion; periods of relative humidity greater than 60%; poor or inadequate ventilation; optimal temperature range (dependent on species); time; and a nutrient source of carbon-containing compounds such as cellulose, dirt, and/or dust.

Sample Collection

The spore trap sampling measures both viable (culturable) spores, nonviable (dead) spores and spores that do not readily culture on agar plates including Basidiospores, *Stachybotrys* spores, and Smuts/Myxomycetes. Total spore data is usually a better

indicator of a microbial problem during the winter months when the spores may be present but not culturable on agar plates. It also is a better technique for assessing the presence of *Stachybotrys* spores in the air.

On November 11, 2010, Northern collected three (3) spore trap indoor air samples from the following areas; Montana Room Basement, Montana Room and the Mercantile Wing. No sample was collected from the outdoors due to the cold temperature and light snow cover on the ground.

NIH did not collect a sample from the basement area beneath the Circulation Desk due to the visible microbial growth and odor noted. The amount of microbial growth noted in this area could have a negative impact on the air quality on the main floor of the building.

The samples were relinquished under chain of custody to Environmental Microbiology Laboratory, Inc. of Phoenix, AZ, for mold spore identification and enumeration.

Laboratory Results

Laboratory results are reported as total counts (fungal spores or fragments) per cubic meter of air.

Laboratory analysis revealed elevated concentrations for the Basement Area beneath the Montana Room of airborne fungal spores. The samples collected form the Montana Room and Mercantile Wing revealed low concentrations (within an acceptable range) of airborne fungal spores. Further, the predominant fungal genera identified for the Montana Room and Mercantile Wing are among the most common types of indoor and outdoor ambient molds. Table 1 provides a summary of the sampling event, including sample numbers, locations, and airborne concentrations. For further details on laboratory results, see the attached laboratory analysis report.

TABLE 1
SUMMARY OF BIOAEROSOL SAMPLING RESULTS
Sample Date: November 11, 2010

Sample No.	Sample Type	Sample Location	Result (Spore/M^3)	Elevated (Yes/No)
16025327	Air	Basement Area Beneath Montana Room	9,366	Yes
16025323	Air	Montana Room	244	No
16025319	Air	Mercantile Wing	107	No

Discussion

There currently are no regulatory limits for airborne fungal levels. Data interpretation is based on a review of the building for conditions promoting fungal growth, the presence of visible fungal growth, and a comparison of air quality data inside the building with that detected outside the building.

The American Conference of Governmental Industrial Hygienists (ACGIH) has rescinded previously published numerical guidelines in their recently published Bioaerosols Assessment and Control. Rather than focus on specific types of fungi or quantitative

measures of fungal prevalence, the ACGIH approach has been to emphasize that active fungal growth in indoor environments is inappropriate and may lead to exposure and adverse health effects.

The American Industrial Hygiene Association (AIHA) has published guidelines for interpreting results. These guidelines state that genera such as *Cladosporium*, *Alternaria*, and *Epicoccum* as well as Basidiomycetes are present in the outdoor air on a seasonal basis. However, in mechanically ventilated buildings with air infiltration, the concentrations of these typically outdoor fungi should be lower than concentrations measured in the outdoor air. Dominance in the indoor air of fungal species not predominant in the outdoor air indicates that these fungi are growing in a building and that the air quality is degraded. The confirmed presence of *Stachybotrys chartarum*; *Aspergillus versicolor*, *flavus*, or *fumigatus*; or *Fusarium moniliforme* requires urgent risk management decisions be made. Confirmed presence is defined as colonies in several samples, many colonies in any sample, or where a single colony was found in a single sample, evidence of the growth of these fungi on building materials by visual inspection.

The International Society of Indoor Air Quality and Climate has proposed guidelines for interpreting environmental samples for fungi. These guidelines state that in naturally ventilated, non-problem buildings, the relative abundance of different fungi in indoor air tends to follow the pattern found in outdoor air, although the numbers are usually smaller. When air-conditioning or mechanical ventilation with filtration is used, indoor fungal concentrations in non-problem buildings may be even lower than in naturally ventilated buildings. When windows are closed or when snow cover reduces outdoor sources of fungi, indoor sources of *Pencillium sp.* and other soil fungi may be more obvious. While a diversity of fungi is usually found in non-problem buildings, one or two fungal species may dominate the indoor air in buildings with persistent moisture problems. The presence or dominance of toxigenic or allergenic species indicates a problem that may cause deterioration of the quality of the indoor air.

Spore Levels – The following data comes from the National Allergy Bureau.

Spores/M³	Result	Symptoms
>0 – 6,500	Low	Sensitive individuals experience
6,500 – 13,000	Moderate	Individuals sensitive to pollens and molds
13,000 – 50,000	High	Most individuals with any sensitivity to molds and pollens
>50,000	Very High	Almost all individuals with any sensitivity to molds and pollens

Mold Overview

Molds, a subset of the Kingdom Fungi, are found in every ecological niche and are necessary for the recycling of organic building blocks that allow plants and animals to live. Included in the group "fungi" are yeasts, molds and mildews, as well as large mushrooms, puffballs and bracket fungi. Molds reproduce by producing spores that germinate and begin producing a branching network of cells (mold growth) called hyphae if a nutrient source with sufficient moisture is available. Fungi are primarily saprophytic, using nonliving organic material as a nutrient source for growth and reproduction.

Mold spores are ubiquitous in nature, making daily exposure commonplace. Spores are present in ambient air as well as on most surfaces, including soil, plants, dust, and building materials. Realistically, there are no methods for eliminating mold spores from a house or building. Mold growth is a destructive process, often causing structural damage to the substrate. The key to preventing mold growth is controlling moisture within a structure. If mold growth is detected, the moisture source(s) should be corrected and moldy materials should be properly cleaned or discarded.

Mold growth can occur on many common building materials, including cloth, carpets, leather, wood, gypsum wallboard and insulation when sufficient moisture is present. When molds grow in moist indoor environments, it is possible for people to become exposed to molds and their products, either by direct contact on surfaces or though inhalation of aerosolized particles. Though destructive to building materials, most types of common indoor molds are not hazardous to healthy individuals. However, the impact on human health depends on the nature of the species involved, the metabolic products produced by these species, the amount and duration of an individual's exposure to molds and their metabolites, and the specific susceptibility of those exposed. Four broad categories of health hazards are generally attributed to molds and their metabolites, including allergens (most common), irritants (affect mucous membranes), toxins, and pathogens (rare).

Further, studies have shown a correlation between the prevalence of fungal growth or elevated concentrations of fungal spores and sick building syndrome.

Conclusions and Recommendations

There is no practical way to eliminate all microbial growth and mold spores in the indoor environment. Molds can be found almost anywhere and can grow on virtually any substance, providing moisture is present. The way to control indoor microbial growth is to control moisture. To help prevent the occurrence or reoccurrence of microbial growth you must eliminate sources of moisture (fix the source of the water problem or leak). Reduce indoor humidity (30-60%) to decrease the chances of microbial growth by venting moisture generating sources to the outdoors. Clean and dry any damp or wet building materials and furnishings within 24-48 hours to prevent microbial growth. Clean microbial growth form hard surfaces with water and detergent and dry completely. Replace absorbent materials. Reduce the potential for condensation on cold surfaces (windows, piping, exterior walls, roof or floors) by adding insulation. In areas where there is a perpetual moisture problem do not install carpeting (concrete floor or walls with leaks or frequent condensation).

The air quality data collected from the Basement Area beneath the Montana Room indicate elevated levels of *Penicillium/Aspergillus* spores. *Penicillium/Aspergillus* spores are small spores that easily become airborne. Both of these genera will continue to grow at low levels of water (high relative humidity exceeding 50% is sufficient). In addition to this area NIH observed microbial growth on the majority of the wood surfaces in the Basement Area beneath the Circulation Desk. NIH recommends that these areas be remediated by an experienced microbial remediation contractor and that all materials contaminated by microbial growth be dispose of properly.

Microbial remediation work should follow the Institute of Inspection, Cleaning and Restoration Certification (IICRC) ANSI-approved S520 Standard and Reference Guide for

Professional Mold Remediation. It should be performed inside a negative air pressure containment using appropriate engineering controls, personal protective equipment, and National Institute for Occupational Safety and Health (NIOSH) approved respiratory protective equipment. Negative pressure in the work area should include HEPA filtered air scrubbers. Personal protective equipment should include full body coveralls and full-face respirators equipped with N95 filter cartridges.

Microbial post remedial air sampling should be performed by an independent third party in conjunction with a visual inspection of the contained areas following the above microbial remediation. The contained area(s) must pass the visual and air clearances prior to tear down of the containment(s)

The air quality data collected from the Main Floor Montana Room and Mercantile Wing did not reveal elevated levels of mold spores. It appears that the negative impact on the air quality is confined to the basement areas.

NIH recommends that access to the two (2) basement areas be restricted until clean-up and post remediation air sampling indicates that the remediation activities and air quality is acceptable.

LIMITATIONS

This assessment report was prepared based on information gathered during the site visit. Conclusions of this report are professional opinions based solely upon site observations and professional interpretations as described in our report. The inspection was limited to a non-destructive visual examination and mold growth may be present in areas not accessed at the time of the survey.

Our opinions and recommendations are intended exclusively for use by North Valley Public Library. The scope of services performed by Northern Industrial Hygiene, Inc. may not be appropriate to satisfy the needs of other users, and any use or re-use of this document, or the findings presented herein, is at the sole risk of the user.

The opinions presented herein apply to the site conditions existing at the time of our investigation. Therefore, our opinions and recommendations may not apply to future conditions that may exist at the site, which we have not had the opportunity to evaluate.

It was a pleasure working with you on this project and if you have any questions regarding this report please feel free to contact us at (406) 542-7520.

Respectfully Submitted,
NORTHERN INDUSTRIAL HYGIENE, INC.

Gregory W Berthelot

Gregory W. Berthelot, CMC
Environmental Scientist
Attachments: Laboratory Report December 10, 2010
Invoice

EMLab P&K

Report for:

Mr. Greg Berthelot
Northern Industrial Hygiene, Inc.
913 SW Higgins
Missoula, MT 59801

Regarding: Project: 499-446; NVPL
EML ID: 732721

Approved by:

Technical Manager
Aaron Agajanian

Dates of Analysis:
Spore trap analysis: 12-10-2010 and 12-10-2010

Service SOPs: Spore trap analysis (1038)

For clarity, we report the number of significant digits as calculated; but, due to the nature of this type of biological data, the number of significant digits that is used for interpretation should generally be one or two. 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 corrections of results is not a standard practice. 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.

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Client: Northern Industrial Hygiene, Inc.
C/O: Mr. Greg Berthelot
Re: 499-446; NVPL

Date of Sampling: 11-11-2010
Date of Receipt: 12-09-2010
Date of Report: 12-10-2010

SPORE TRAP REPORT: NON-VIABLE METHODOLOGY

Location:	1: 16025327 Bsmt Montana Rm				2: 16025323 Montana Rm				3: 16025319 Merc Bldg West End			
Comments (see below)	None				None				None			
Lab ID-Version‡:	3243393-1				3243394-1				3243395-1			
Sample volume (liters)	150				150				150			
Background debris (1-4+)††	4+				4+				3+			
	Count	Count/m3	DL/m3*	%	Count	Count/m3	DL/m3*	%	Count	Count/m3	DL/m3*	%
Hyphal fragments	5	33	7	n/a	1	7	7	n/a	1	7	7	n/a
Pollen	1	7	7	n/a	1	7	7	n/a				
§ TOTAL FUNGAL SPORES	204	9,400	n/a	100	36	240	n/a	100	16	110	n/a	100
Alternaria									1	7	7	6
Arthrinium												
Ascospores	1	7	7	< 1								
Basidiospores	8	53	7	1	7	47	7	19	3	20	7	19
Botrytis												
Chaetomium	24	160	7	2								
Cladosporium	27	180	7	2	10	67	7	28	7	47	7	44
Curvularia												
Epicoccum												
Myrothecium												
Nigrospora												
Penicillium/Aspergillus types	134	8,900	67	95	16	110	7	44	2	13	7	13
Pithomyces												
Smuts, Periconia, Myxomycetes	5	33	7	< 1	3	20	7	8	3	20	7	19
Stachybotrys	5	33	7	< 1								
Stemphylium												
Torula												
Ulocladium												

Comments:

Spore types listed without a count or data entry were not detected during the course of the analysis for the respective sample.
The Limit of Detection is the product of a raw count of 1 and 100 divided by the percent read. The analytical sensitivity (counts/m3) is the product of the Limit of Detection and 1000 divided by the sample volume.

*The DL/m3 has been rounded to a whole number.

‡ 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 Fungal Spores has been rounded to two significant figures to reflect analytical precision.

Introduction

Molds are a natural and important part of our environment. They are ubiquitous and are found virtually everywhere. Molds produce tiny spores to reproduce. These spores can be found in both indoor and outdoor air and on indoor and outdoor surfaces. When mold spores land on a damp spot, they may begin growing and digesting whatever they are growing on in order to survive, leading to adverse conditions. In response to increasing public concern, a number of government authorities, including the United States EPA, California Department of Health Services and New York City Department of Health, have developed recommendations and guidelines for assessment and remediation of mold. Websites for these organizations can be found at the end of this report.

While it is generally accepted that molds can be allergenic and can lead to adverse health conditions in susceptible people, unfortunately there are no widely accepted or regulated interpretive standards or numerical guidelines for the interpretation of microbial data. The absence of standards often makes interpretation of microbial data difficult and controversial. This report has been designed to provide some basic interpretive information using certain assumptions and facts that have been extracted from a number of peer reviewed texts, such as the American Conference of Governmental Industrial Hygienists (ACGIH). In the absence of standards, the user must determine the appropriateness and applicability of this report to any given situation. Identification of the presence of a particular fungus in an indoor environment does not necessarily mean that the building occupants are or are not being exposed to antigenic or toxic agents.

None of the information contained herein should be construed as medical advice or a call to action for evacuation or remediation. Only a qualified physician should make any decision relative to medical significance.

EMLab P&K did not conduct the site investigation, provide consulting or collect the samples referenced in this report. EMLab P&K's primary involvement in this project is to provide analytical results for the samples submitted. The data presented in this report are based on the samples and accompanying information provided and represents concentrations at a point in time under the conditions sampled.

EMLab P&K's standard terms and conditions govern all aspects of this report.

Materials

Please refer to the chain of custody included with this report.

Methods

1. **Surface Samples – Swab, Dust, Tape and Bulk Samples**
   Swab, Dust and Tape samples are mounted on a glass slide and observed under a bright field microscope for either Qualitative or Quantitative Examination. A bulk sample is also simultaneously observed under a stereomicroscope to look for signs of any visible discoloration or fungal growth, which is then mounted and observed under a bright field microscope for either Qualitative or Quantitative Examination. The samples are analyzed at a

minimum of 200X magnification and up to a 1000X magnification. In the qualitative examination, the prepared samples are observed for the presence of any structures or skewing of spore distribution that may indicate growth in the sample being analyzed. In the quantitative examination, the mold spores detected in the sample are counted and reported as spores per cm^2, spores per gram (or 1000mg), or spores per swab/wipe, etc depending on the sample type. These methodologies do not differentiate between viable and non-viable fungal spores.

2. Air Samples- Spore Trap Device

Spore traps are a unique sampling device designed for the rapid collection and analysis of a wide range of airborne particulates, including fungal spores. While analyzing the sample, the analyst takes a number of variables into account to select the proper analytical method to accurately determine the densities of the various spores on the trace. The densities of the debris and the spores on the trace will determine the approach to analyzing the sample. In general, the sample is directly mounted under the microscope and the various airborne particles detected are counted at a minimum of 200X magnification and up to 1000X magnification, with the entire trace (100% of the sample) being analyzed at 200X or 600X. This method does not differentiate between viable and non-viable fungal spores. This technique does not allow for the differentiation between *Aspergillus* and *Penicillium* spores. Additionally, depending on morphology, other non-distinctive spores are reported in categories such as ascospores or basidiospores. All slides are graded with the following debris scale for data qualification.

Debris Rating	Description	Interpretation
None	No particles detected.	No particulates on slide. The absence of particulates could indicate improper sampling as most air samples typically capture some particles.
<1+	Good visibility. A few particles detected.	Reported values are not affected by debris.
1+	Good visibility. No crowding of particles.	
2+	Decent visibility. Particles beginning to crowd.	Non-microbial particulates can mask the presence of fungal spores. As a result, actual values could be higher than the numbers reported. Higher debris ratings increase the probability of this bias.
3+	Decent visibility. Particles beginning to crowd.	
4+	Poor visibility. Particles beginning to overlap.	Excessive debris detected in the sample. Counts reported may vary drastically and actual values could be higher than the numbers reported. The sample should be collected at a shorter time interval, or other measures taken to reduce the collection of non-microbial debris. In addition, a >4+ rating will only allow for a count from the perimeter of the slide.
>4+	Poor visibility. Particles overlapping.	

3. Comments

Comments identify issues or events that are relevant to your analytical results. A comment includes information about any peculiar observation or situation encountered while analyzing the sample. In each case, the comments provide significant information vital to the interpretation of the laboratory data.

4. **Data Interpretation**

According to ACGIH, "Data from individual sampling episodes is often interpreted with respect to baseline data from other environments or the same environment under anticipated low exposure conditions." In the absence of established acceptable exposure limits, it is often necessary to use a comparison standard when interpreting data. In this instance, it will be necessary to sample the suspect area as well as a non-suspect area.

According to ACGIH, "...active fungal growth in indoor environments is inappropriate and may lead to exposure and adverse health effects."

a. Total Fungal Spores

According to ACGIH, ".... differences that can detected with manageable sample sizes are likely to be in 10- fold multiplicative steps (e.g., 100 versus 1000...)". Following this logic, if total fungal spores are ten (10) times greater in the sample from a suspect area than in the negative control sample collected from a non-suspect area, then that sample area may be a fungal amplification site.

b. Mycelial Fragments

Mycelium is a fungal mass that constitutes the vegetative or living body of a fungus. Following the same logic above, if total mycelial fragments are ten (10) times greater in the suspect sample than in the negative control, then the sample area is considered to be a fungal amplification site. The presence of mycelial fragments provides evidence of microbial growth.

c. Mycotoxins

Molds can produce toxic substances called mycotoxins. More tha n 200 mycotoxins have been identified from common molds, and many more remain to be identified. Some of the molds that are known to produce mycotoxins are commonly found in moisture-damaged buildings. Exposure pathways for mycotoxins can include inhalation, ingestion, or skin contact. Although some mycotoxins are well known to affect humans and have been shown to be responsible for human health effects, for many mycotoxins, little information is available, and in some cases research is ongoing. Some molds can produce several toxins, and some molds produce mycotoxins only under certain environmental conditions. The presence of mold in a building does not necessarily mean that mycotoxins are present or that they are present in large quantities.

d. Water Indicator Molds

Certain authorities identify certain molds whose presence indicates excessive moisture. The presence of a few spores of indicator mold should be interpreted with caution. Additionally, it should be recognized that these named molds are not necessarily the only ones of potential significance.

e. Mold Glossary

Specific characteristics of the individual molds listed in the report are presented in Table 1.

f. Useful Resources

i. Guidelines on Assessment and Remediation of Fungi in Indoor Environments, New York City Department of Health.
www.ci.nyc.ny.us/html/doh/html/epi/moldrpt1.html

ii. Facts about Mold, New York City Department of Health.
www.ci.nyc.ny.us/html/doh/html/epi/epimold.html
iii. Mold Resources, United States Environmental Protection Agency.
http://www.epa.gov/mold/moldresources.html
iv. Mold in My Home, What do I do? California Department of Health Services.
www.asbestos.org/Microbial/index.html

Table 1: Summary of Specific Mold Characteristics

Fungi	Environmental Indicator		Typically Found
Alternaria			*Alternaria* is one of the more common fungi found in nature. It is found growing indoors on a variety of substrates including wallboards, painted walls, etc.
Arthrinium			*Arthrinium* is a saprobe and is found on plants. It is rarely found growing indoors.
Ascospores			Ascospores are ubiquitous in nature and are commonly found in the outdoor environment. Some fungi that belong to the ascomycete family include the sexual forms of *Penicillium/ Aspergillus, Chaetomium*, etc that may be frequently found growing on damp substrates.
Aureobasidium			*Aureobasidium* is commonly found in a variety of soils. Indoors, it is commonly found where moisture accumulates, especially bathrooms, and kitchens, on shower curtains, tile grout, windowsills, textiles, and liquid waste materials.
Basidiospores			Basidiospores are Saprophytes and plant pathogens and are commonly found in gardens, forests, and woodlands. They also include organisms that are the agent of "dry rot," and other fungi that cause white and brown wood rot, which may grow and destroy the structural wood of buildings.
Bipolaris/ Dreschlera			*Bipolaris* and *Dreschlera* are usually found associated with plant debris, and soil. They are plant pathogens of numerous plants, particularly grasses. *Bipolaris* and *Dreschlera* can grow indoors on a variety of substrates.
Botrytis			*Botrytis* is commonly found in tropical and temperate climates growing on vegetative matter. They may be found indoors in conjugation with indoor plants, fruits and vegetables.
Chaetomium			*Chaetomium* is often found on materials containing cellulose such as sheetrock paper, or other wet materials.
Cladosporium			*Cladosporium* is a common outdoor mold. They are commonly found on dead plants, food, textiles, and a variety of other surfaces. Indoors, they can grow on a variety of substrates including textiles, wood, moist windowsills, etc. It can grow at 0°C and is associated with refrigerated foods.
Curvularia			*Curvularia* is found on plant materials and is considered a saprobe. Indoors, they can grow on a variety of substrates.
Epicoccum			*Epicoccum* is a saprophyte and considered a weekly parasitic secondary invader of plants. They tend to colonize continuously damp materials such as damp wallboard and fabrics.

Fusarium			*Fusarium* requires very wet conditions and is frequently isolated from plants and grains. They colonize continuously damp materials such as damp wallboard and water reservoirs for humidifiers and drip pans.
Memnoniella			*Memnoniella* can be found growing on a variety of cellulose-containing materials.
Nigrospora			*Nigrospora* is especially abundant in warm climates and is rarely found growing indoors.
Oidium/ Peronospora			*Oidium* and *Peronospora* are plant pathogens and are not found growing indoors.
Penicillium/ Aspergillus			*Penicillium* and *Aspergillus* are ubiquitous in environment. *Aspergillus* tends to colonize continuously damp materials such as damp wallboard and fabrics. *Penicillium* is commonly found in house dusts, wallpaper, decaying fabrics, moist clipboards, etc.
Pithomyces/ Ulocladium			*Pithomyces* is commonly found on grass and decaying plant material and are rarely found growing indoors. *Ulocladium* has a high water requirement and therefore colonizes continuously damp materials such as damp wallboard and fabrics.
Rusts			Rusts are plant pathogens and only grow on host plants.
Smuts/ *Periconia*/ Myxomycetes			Smuts and Myxomycetes are parasitic plant pathogens that require a living host. Smuts do not usually grow indoors. *Periconia* are rarely found growing indoors. Myxomycetes are occasionally found indoors, but rarely growing.
Stachybotrys			*Stachybotrys* are commonly found indoors on wet materials containing cellulose, such as wallboard, jute, wicker, straw baskets, and other paper materials.
Stemphylium			*Stemphylium* is either parasitic or saprophytic and is rarely found growing indoors.
Torula			*Torula* can grow indoors on cellulose containing materials such as wallboard, jute, wicker, straw baskets, and other paper materials.
Other brown/ colorless			An uncharacteristic fungal spore that does not lend itself to classification via direct microscopy.

 Potential Water Intrusion/Indicator Mold

 Potential Water Intrusion/Indicator Mold Capable of Mycotoxin Production

Quality Programs

The EMLab P&K's laboratory network is staffed with highly trained analysts, the majority of which hold advanced degrees. The reliability of test results depends on many factors such as the personnel performing the tests, environmental conditions, selection and validation of test methods, equipment functioning, as well as the sampling, storage and handling of test items, all of which are a reflection of the overall quality system of the laboratory.

EMLab P&K has modeled its quality system after ISO 17025, General Requirements for the Competence of Testing and Calibration Laboratories, one of the most stringent sets of standards in the industry, to ensure that its customers receive the highest standard of accuracy, reliability, and impartiality that they have come to expect from the leader in the environmental industry. EMLab P&K's laboratories adherence to the standards set forth in ISO 17025 has been validated and

formally recognized through accreditations granted by an independent outside agency, American Industrial Hygiene Association (AIHA), on a site by site basis. As an additional measure to demonstrate its competency to perform the analyses it offers to its clients, EMLab P&K laboratories also participate in a variety of different proficiency testing programs, including the Environmental Microbiology Proficiency Analytical Testing Program (EMPAT) sponsored by the American Industrial Hygiene Association.

As part of our continuous commitment to excellence, EMLab P&K laboratories are also inspected, licensed and/or accredited by a number of governmental agencies and independent associations in addition to those already mentioned above. The scope of services, accreditation certificates, and proficiency results can all be accessed at www.emlabpk.com.

References

1. Bioaerosols: Assessment and Control. Janet Macher, Ed., American Conference of Government Industrial Hygienists, Cincinnati, OH (1999).

2. EPA: The Inside Story. A Guide to Indoor Air Quality, United States Environmental Protection Agency and the United States Consumer Product Safety Commission, Washington DC (1995).

3. Health Canada: Exposure Guidelines for Residential Indoor Air Quality. Environmental Health Directorate. Health Protection Branch, Health Canada, Ottawa, Ontario (1989).

4. IIRC: Standard and Reference Guide for Professional Water Damage Restoration, 2nd Ed. Institute of Inspection, Cleaning and Restoration, Vancouver, WA (1999).

5. Field Guide for the Determination of Bio logical Contaminants in Environmental Samples. American Industrial Hygiene Association, Fairfax, VA (1996).

6. Standards of Practice for the Assessment of Indoor Environmental Quality, Volume I: Mold Sampling, Assessment of Mold Contamination. Indoor Environmental Standards Organization (2002).

12-10-2010: 499-446

EMLab P&K
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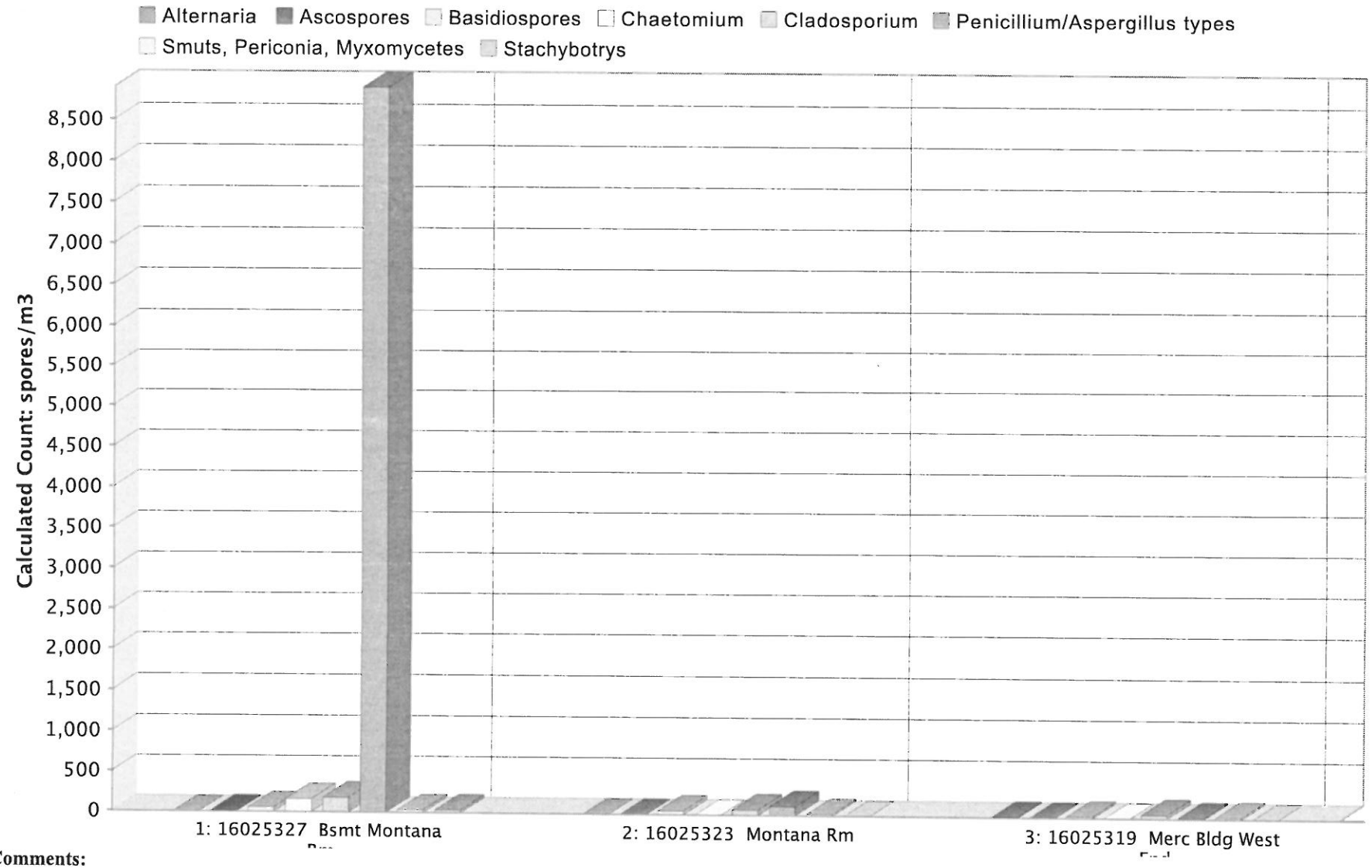
SPORE TRAP REPORT: NON-VIABLE METHODOLOGY



Comments:

Note: Graphical output may understate the importance of certain "marker" genera.
Aerotech Laboratories, Inc

CHAIN OF CUSTODY

www.EMLabPK.com

EMLab P&K

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San Bruno, CA: 1150 Bayhill Drive, #100, San Bruno, CA 94066 • (866) 888-6653

WEATHER		Fog	Rain	Snow	Wind	Clear
LEVEL	None		X			
	Light	X		X		
	Moderate				X	
	Heavy					

000732721

SERVICES (✓ Boxes)

CONTACT INFORMATION

Company: Northern Industrial Hygiene
Address: 913 SW Higgins Ave Ste 202 Missoula, MT 59801
Contact: Greg Berthelot
Special Instructions: gberthelot@bridgeband.com
Phone: 406-370-5130

PROJECT INFORMATION

Project ID: 499-446
Project Desc.: NVPL
Project Zip Code:
Sampling Date & Time: 11-11-10 1300hrs
PO Number:

TURN AROUND TIME CODES - (TAT)

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

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

SAMPLE ID	DESCRIPTION	Sample Type (Below)	TAT (Above)	Total Volume/Area (as applicable)	NOTES (Time of day, Temp, RH, etc.)	Spore Trap	Tape/Swab/Bulk	BioCassette™ Andersen, SAS, Swab, Water, Bulk, Dust, Soil, Concart, Plate	Other Requests
16025327	Bsmt Montana Rm	ST	ND	150L	1357hrs 59.1°F 44.0%	X			
16025323	Montana Rm	ST	ND	150L	1414 hrs 66.3°F 32.8%	X			
16025319	Merc Bldg West End	ST	ND	150L	1418hrs 69.4°F 28.9%	X			

Spore Trap: Fungi - Spore Trap Analysis; Spore Trap Analysis - Other particles
Tape/Swab/Bulk: Direct Microscopic Exam (Qualitative); Quantitative Spore Count Direct Exam
BioCassette™ Andersen, SAS, Swab, Water, Bulk, Dust, Soil, Concart, Plate: 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 and Counts (Culturable Air and Surface Bacteria); Legionella culture; Total Coliform, E.coli (Presence/Absence); Membrane Filtration (Please specify organism); MPN Bacteria (Please specify organism); QuantiTray - Sewage Screen
Other Requests: Asbestos Analysis - PCM Airborne Fiber Count (NIOSH 7400); Asbestos Analysis - PLM (EPA method 600/R-93-116); PCR (please specify test)

SAMPLE TYPE CODES

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

RELINQUISHED BY	DATE & TIME
[signature]	12-8-10 1200hrs
[signature]	12-08-10

RECEIVED BY	DATE & TIME
[signature]	9:30 AM

By submitting this Chain of Custody, you agree to be bound by the terms and conditions set forth at www.emlabpk.com/terms.html