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COMMERCIAL BUILDING INSPECTION REPORT Indoor Air Quality Assessment Town of Addison 334 Water St Addison, Me

Inspector: Terry L Pierson, CIEC TP Environmental Consulting

Date of Inspection: 8/22/2014

Scope of Inspection – Indoor air quality in the building will be determined by visual means, qualitative and quantitative analysis. Analysis will include evaluation of particulate and mold levels along with Lead and Indoor Air Quality.

Subject Property Description – Two story building with a crawlspace

The following sections of this report describe key areas of interest pertaining to our inspection of the subject property.

Conclusions –

Based on the guidelines below, and on our experience with many similar samples, the following comments can be made:

The study and understanding of molds is a progressing science. Because different methods of sampling, collection and analysis exist within the indoor air quality industry,

different inspectors or analysts may not always agree on the mold concentrations present in a given environment. Additionally, the airborne levels of mold change frequently and by large amounts due to many factors including activity levels, weather, air exchange rates (indoors), and disturbance of growth sites. It is possible for report interpretations and ranges of accuracy to vary since comprehensive, generally accepted industry standards do not currently exist for indoor air quality inspections of mold in business or residential indoor environments. This Report is intended to provide an analysis based upon samples taken at the site at the time of the inspection. With that said the following are my conclusions.

Visible mold was identified in several areas. Kitchen cabinets, Kitchen storage 2nd level storage, crawlspace and Bathrooms.



Air O Cell samples were elevated significantly, indicating mold growth in the area of the Stairway/Crawlspace, Kitchen and Kitchen Storage. Both viable and nonviable spores and fragments are reported with no distinction. When levels reach this point there may be an issue that needs to be addressed unless there is a corresponding number in the outdoor sample. If no water intrusion or mold issue is found during the inspection these levels can be achieved by a dusty home or A/C system. Mold levels have been elevated outside in the last month. Several water marker molds were identified.

Surface samples of several areas identified mold growth. *Stachybotrys* and *Ulocladium* both water markers molds were identified on the surfaces.

The air sample taken identified elevated levels of the third water marker mold *Chaetomium*

The levels and mold identified in the building are indications that there is a significant mold issue. Both *Baxter et als* and *The National Allergy Bureau* guidelines consider the levels identified in the building as high. When levels reach this point there may be an issue that needs to be addressed unless there is a corresponding number in the outdoor sample. Several water marker molds were identified.

Carbon dioxide levels were not elevated in the building. Carbon dioxide levels should be maintained below 750 ppm

Lead hazards were found on all levels of the building

Recommendations –

Based on my evaluation of the property the following is recommended

Lead Abatement is required on the 1st and 2nd Level due to dust samples from both levels tested positive for Lead. Lead Abatement will run \$8 to \$15 per square foot. For this abatement project cost could run up to \$200,000.

Mold remediation is required and this is a Level IV: Extensive Contamination (greater than 100 contiguous square feet in an area)

A health and safety professional with experience performing microbial investigations should be consulted prior to remediation activities to provide oversight for the project. The following procedures are recommended:

- a. Personnel trained in the handling of hazardous material equipped with:
- i. Full-face respirators with high efficiency particulate air (HEPA) cartridges
 - ii. Disposable protective clothing covering both head and shoes.
 - iii. Gloves
- b. Containment of the affected area:

- i. Complete isolation of work area from the occupied spaces using plastic sheeting sealed with duct tape (including ventilation ducts/grills, fixtures, and any other openings)
- ii. The use of an exhaust fan with a HEPA filter to generate negative

pressurization

- iii. Airlocks and decontamination room
- c. Vacating people from spaces adjacent to the work area is not necessary but is recommended in the presence of infants (less than 12 months old), persons having undergone recent surgery, immune suppressed people, or people with chronic inflammatory lung diseases (e.g., asthma, hypersensitivity pneumonitis, and severe allergies).
- d. Contaminated material that cannot be cleaned should be removed from the building in sealed plastic bags. The outside of the bags should be cleaned with a damp cloth and a detergent solution or HEPA vacuumed in the decontamination chamber prior to their transport to uncontaminated areas of the building. There are no special requirements for the disposal of moldy materials.
- e. The contained area and decontamination room should be HEPA vacuumed and cleaned with a damp cloth and/or mop with a detergent solution and be visibly clean prior to the removal of isolation barriers.
- f. Air monitoring should be conducted prior to occupancy to determine if the area is fit to reoccupy.

Mold removal cost is calculated based on several aspects. It largely depends on how much area of the building is infected by mold and whether there are any structural damages involved. For example, the average cost to remove mold from basement is comparatively lesser than whole building mold remediation cost.

Overall, a typical mold remediation project to remove mold from the ducts, crawl spaces, basement, walls and attic of a building this size runs around \$20,000 -\$60,000. And if the mold has caused widespread structural damage, repair costs can increase the total to as much as \$100,000 -\$200,000 or more. This cost does not include any rebuilding of the structure.

ASSESSMENT AND SAMPLING

All investigation techniques and sampling conducted were performed in accordance with the Environmental Criteria and Assessment Guidelines, recommended by the U.S. EPA Office of Health and Environmental Assessment, US EPA 600/8-91/202 (ECAO-R-0315). The investigative and sampling protocols utilized during the investigation also followed guidelines established by the American Conference of Governmental Industrial Hygienists (ACGIH) and the National Institute of Occupational Safety and Health (NIOSH).

INSTRUMENTATION

Protimeter Moisture Meter

Indicates relative moisture of building materials up to one inch deep; used along walls, floors, ceilings, and other building materials

Less than 15% moisture indicates normal moisture levels

Between 15% and 25% warrant further investigation

Greater than 25% indicates excessive moisture

Protimeter moisture meter point measurements: indicates actual percent moisture at the surface of building materials; three readings were taken and the average percent moisture calculated in areas of concern, windowsills, and walls with plumbing

SAMPLING METHODS:

AIR SAMPLES

Laser Particulate Counts

A Laser Particle Counter will be utilized to evaluate the air samples if samples are abnormal vacuum sampling methods will be used to evaluate remediation. Airborne Particulate matter concentration counts are utilized as an initial survey to determine filtration efficiency and areas of elevated particulate matter. Particulate measurements are an indicator of possible problems, but are not conclusive. Elevated particulate matter in indoor environments can come from a variety of both indoor and outdoor sources (automotive emissions man made fibers, dust, cigarette smoke, fabric furnishings, carpet, etc.).

Air – O – Cells Vacuum Sampling

Air sampling technique that reports results in spore per cubic meter of air(spores/m3). Both viable and non-viable spores and fragments are reported with no distinction. The sampling utilizes a Zefon cassette for the collection of spores onto a readable microscopic slide. The slide contains a clear adhesive that captures the spores for direct reading under a microscope. Slides area typically read at 600 power. However, some genera are indistinguishable. For example, Aspergillus and Penicillium spores are identified as Aspergillus/Penicillium spores. Depending on laboratory capabilities, hyphae, mycelial, fibers, epithelial cells and pollen are also identified. Suggested sampling time is 10 minutes at 15L/min, however, sampling times may vary depending on expected results.

Test samples from the site examined in my laboratory using appropriate chemical/stain preparations and a light microscope at magnifications up to 1000X.

SURFACE SAMPLES

Tape lift, bulk and swab sampling, are techniques used for direct examination. A direct exam allows for the immediate determination of the presence of fungal spores as well as what types of fungi are present. Direct examinations should only be used to sample visible mold growth in a contaminated area since most surfaces collect a mixture of fungal spores that are normally present in the environment.

For Tape lift:

1. Clear (transparent) Scotch or other brand tape (frosted tape hides the

spores).

2. New plastic bag to hold specimen(s)

For bulk:

1. Sterile container or new plastic bag or Whirl-a Pack to hold and transport specimen.

For swab:

Sterile culturette/swab with appropriate buffer solution to collect and transport specimen

SAMPLES AND RESULTS:

Results of all samples and assessments are summarized in the tables below

Lead Samples

Lead hazards were found in the locations listed below. The identified lead hazards are listed by type and location. See the Lead Hazard Control Methods section for approved methods of controlling these hazards. The hazards below are prioritized according to the severity of the hazard.

**Regulatory limit is 0.50% lead by weight (EPA/HUD Guidelines)

Interior Paint: 2nd Level paint on tin walls and ceilings Window sils: 2nd Level Exterior Paint: Not Tested Dust: 1st and 2nd Level Soil: Not Tested Water: Not Tested

Building components in a room that are similar in construction history to those that tested positive for lead are considered positive for lead.

LEAD ANALYSIS		
SAMPLE NUMBER	SAMPLE LOCATION	Lead Positive / Negative
1	2 nd Level Walls	Positive
2	2 nd Level Dust	Positive
3	1 st Level Dust	Positive
4	Assessor Office	Positive

Lead is hazardous, especially for children who are six years of age or younger. Lead can reduce intelligence, cause behavior and learning problems, slow growth and impair hearing. Children can get lead in their bodies by breathing or swallowing lead dust, or by eating soil or paint chips with lead in them.

Lead-based paint is any paint or surface coating that contains lead equal to or in excess of 1.0 milligrams per square centimeter (1.0 mg/cm2) or equal to or in excess of 0.5% by weight. Lead-based paint is hazardous when it is:

1.On a friction surface. The paint on surfaces like window sashes and jambs can break down during normal use and release lead dust. If dust levels on the nearest flat surface exceed acceptable levels, then the friction surface is a hazard.

2. On a chewable surface that has evidence of teeth marks. These are surfaces, such as window sills, railings, door edges and stair edges that that a young child can mouth or chew.

3. On an impact surface where there is damaged or otherwise deteriorated paint from impact from a related building component (such as a door and door frame banging together).

4. Deteriorated, e.g., peeling, chipping, chalking, or cracking. When lead paint breaks down or is disturbed due to remodeling, renovating, dry scraping or water damage, paint chips and dust can be released that can contaminate the home and be easily ingested by young children through hand-to-mouth activity.

Maintenance of structures with lead paint:

(1)Deteriorated Lead-Based Paint on Non-friction or Non-impact Surfaces:

Examples include interior or exterior walls, ceilings, trim, casings, baseboards, etc.

a) Removal of the lead-based painted component and replacement with a lead-free component;

 b) Paint removal by separation of the lead-based paint from the substrate using heat guns (operated below eleven hundred degrees Fahrenheit), chemicals, or certain abrasive measures

either onsite or offsite;

c) Enclosure of the lead-based painted component with durable materials. Durable materials include wallboard, drywall, paneling, siding, coil stock and the sealing or caulking of edges and

joints so as to prevent or control chalking, flaking, peeling, scaling or loose lead-containing substances from becoming part of house dust or otherwise accessible to children;

d) Encapsulation of the lead-based painted component by coating and sealing of the component with a durable surface coating approved in rule 3701-32-13 of the Administrative Code;
e) Paint stabilization as defined in rule 3701-32-01 of the Administrative Code and a written ongoing maintenance and monitoring schedule; or

f) Any other lead-safe method of permanently removing the lead hazard.

(2) Deteriorated Lead-Based Paint on Friction or Impact Surfaces: Examples include window systems, doors, floors, etc.

a) Removal of the lead-based painted component and replacement with lead-free components;
b) Lead-based paint removal by separation of the lead-based paint from the substrate using heat guns (operated below eleven hundred degrees Fahrenheit), chemicals or certain abrasive measures either onsite or offsite;

c) Enclosure of the impact surfaces with durable materials. Durable materials include wallboard, drywall, paneling, a quarter inch or thicker plywood or other underlayment for floors, coil stock and the sealing or caulking of edges and joints so as to prevent or control chalking, flaking, peeling scaling, or loose lead-containing substances from becoming part of house dust or otherwise accessible to children. The underlayment for floors must be covered with a cleanable, impermeable surface;

d) Elimination of the friction points or application of a treatment that will prevent abrasion of the friction surface and a written ongoing maintenance and monitoring schedule; or
 e) Any other lead-safe method of permanently removing the lead hazard.

(3) Chewable Surfaces:

Examples include window sills, railings and other child-accessible surfaces that show evidence of teeth marks.

a) Removal of the lead-based painted component and replacement with lead-free components;
b) Lead-based paint removal by separation of the lead-based paint from the substrate using heat guns (operated below eleven hundred degrees Fahrenheit), chemicals or certain abrasive measures either onsite or offsite;

c) Enclosure of the lead-based painted component with a material that cannot be penetrated by a child's teeth;

d) Encapsulation of the lead-based painted component by coating and sealing of the component with a durable surface coating approved in rule 3701-32-13 of the Administrative Code; or

e) Any other lead safe method of permanently removing the lead hazard.

The following practices are PROHIBITED:

(1) Open flame burning or torching;

(2) Machine sanding or grinding without a HEPA local vacuum exhaust tool;

(3) Abrasive blasting or sandblasting without a HEPA local vacuum exhaust tool;

(4) Use of a heat gun operating above one thousand one hundred degrees Fahrenheit;

(5) Charring paint;

(6) Dry sanding;

(7) Dry scraping, except when done as follows:

a) In conjunction with a heat gun operating at not more than one thousand one hundred degrees Fahrenheit;

b) Within one foot of an electrical outlet;

c) To treat defective paint spots totaling not more than two square feet in an interior room or space or twenty square feet on an exterior surface.

(8) Uncontained hydroblasting or high-pressure washing; and

(9) Paint stripping in a poorly ventilated space using a volatile stripper that is considered a hazardous substance under 16 C.F.R. 1500.3 or a hazardous chemical under 29 C.F.R. 1910.1200 or 29 C.F.R. 1926.59 in the type of work being performed.

Moisture Assessment

1st Level Floors had a elevated Moisture Level of 20% to 30% Indications of moisture issues in crawlspace area

Surface Samples

SURFACE SAMPLES – TAPE LIFT

Microscopic Examination of Fungal Spores, Fungal Structures, Hyphae, and Other Particulates Analysis Date: 08/28/2013

DESCRIPTION	MISC SPORES PRESENT	MOLD GROWTH	OTHER COMMENTS	GENERAL IMPRESSION
Lab ID-Version 5696851-1 Kitchen Storage Floor and Walls	None	4+ Stachybotrys species (spores, hyphae, conidiophores) 1+ Ulocladium species (spores, hyphae, conidiophores)	None	Mold Growth

Air Samples

AIR QUALITY PARAMETERS				
LOCATION		Particulate Levels >3 Microns Particles per Cubic Meter	Carbon Dioxide Levels ppm <750 ppm	*Mold Spores/M³ <10,000
1 st Level Stairway		141,000	541	6300
1 st Level Kitchen		85,000	681	8800
1 st Level Main Room		56,000	706	
2 nd Level Assessor Office		3900	556	480
2 nd Level Main Room		5200	622	

*Baxter et als: Mold contamination is considered present in a building when the total mold spore concentration per cubic meter is above 10,000.

The National Allergy Bureau, reporting the NAB SCALE (National Allergy Bureau) of mold and pollen counts, considers mold counts in outdoor/indoor air of 0-6499 spores per cubic meter of air as low, to 6500 to 12,999 spores per cubic meter of air as moderate, to 13,000 to 49,999 spores per cubic meter of air as high, and above 50,000 as very high. At "high" levels most individuals with any sensitivity will experience symptoms

Carbon Dioxide Levels

Carbon dioxide levels are generally not a cause for concern when daily average levels are below 750 ppm. Carbon dioxide can quickly build up inside buildings when people are present, causing air to feel "stale."

Particulate Assessment

Particle allergens are generally a cause for concern when average levels are above 10,000 particles per cubic foot.

Particle allergens are known to trigger asthma and allergy symptoms at levels above 35,000 particles per cubic foot.

Significant differences are identified when suspect air samples are in excess of 10x non-suspect air samples

Particle allergens are always present in the air. They can build up to unhealthy levels due to activities in the home the presence of excessive sources, and heating/cooling system issues.

Air-O-Cell Mold Spore Counts

Air-O-Cell([™]) Cassette Analysis of Fungal Spores & Other Airborne Particulates by Optical Microscopy

Fungi Identified	SPORES/M3		
Location: Sample:	Stairway A1	Kitchen Storage A2	Assessor Office A3
Generally able to grow indoors*			
Alternaria			
Bipolaris/Drechslera group			
Chaetomium***		4900	
Cladosporium			
Epicoccum	13		
Nigrospora			
Penicillium/Aspergillus types	6200	3900	480
Stachybotrys***			
Seldom found growing indoors**			
Ascospores			
Basidiospores			

Rusts	40		
Smuts, Periconia, Myxomycetes	13		
Pithomyces	13	13	
Polythrincium			
TOTAL SPORES/M3	6300	8800	480

***Water marker mold

Mold Spore Level Guide © (19)

0-50 spores - These are only trace levels and are not an issue. Even Stachybotrys is not considered an issue at these levels if the sample does not also contain water markers like Chaetomium and Fusarium or high levels of Penicillium/Aspergillus.

50-200 spores - These are still very low levels. The toxic mold species Stachybotrys and Memnoniella are just about the only species that are considered an issue at this level.

200-500 spores - Up to this point, the most common species (Penicillium/Aspergillus, Cladosporium and Curvularia) are still not an issue and are in the normal range.

500-1500 spores - Sometimes the Penicillium/Aspergillus & Cladosporium levels are in this range and there is not an issue that needs to be remediated. If no water intrusion or mold issue is found during the inspection, these levels can be caused by normal life in an enclosed environment.

1500-3000 spores - This is where the grey area begins. When levels reach this point there may be an issue that needs to be addressed unless there is a corresponding number in the outdoor sample. If no water intrusion or mold issue is found during the inspection these levels can be achieved by a dusty home or A/C system.

3000-10,000 spores - Unless there is a corresponding number in the outdoor sample, this is the point were some remediation may be necessary. If a mold spore source has been identified, then clean up of that area is needed. If there was no water intrusion or mold issue found, the home may need to be cleaned and the duct system should be evaluated.

10,000-25,000 spores - Unless there is a corresponding number in the outdoor sample, a mold spore source has usually been identified and remediation of the area is needed. If there was no water intrusion or mold issue found, the duct system may need to be cleaned and/or a general "Spring Cleaning" of the home.

25,000-75,000+ spores - When spore levels are at this point, a mold issue will be easy to identify. Clean up will be required and should be performed by a Professional Mold Remediator.

75,000-1,000,000+ spores - When spore levels are at this point a mold issue will be evident. Remediation will be required and needs to be performed by a Professional Mold Remediator.

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IBC 2009 Maine Uniform Building and Energy Code"MUBEC"

Disclaimer

Information gathered during this limited visual inspection and presented in this report may not address every problem that may exist with the property. **TP Environmental Consulting makes no warranty that all problems have been addressed.**

No warranty, expressed or implied, is made as to the professional advice included in this report or the safety, condition, or any other aspect of the properties assayed. This report represents professional opinions based on our analysis of selected and limited data and within the limited scope of our investigation, budgetary restraints, and physical limitations of this project and should not be considered as scientific certainties. This report focuses primarily on microbials in the suspect areas that were identified at the time of testing based on the samples collected. Our findings are limited to only those areas within the scope of our investigation that were readily accessible and visible to the investigator during the assay. We make no representations regarding the existence or absence of any conditions that may lead to degradation or contamination behind building materials, walls, flooring, or personal property.

The results from the investigation and samples collected should only be considered as an indicator of conditions at the time of testing and are not intended to represent or guarantee the absence of any contaminants in any areas. It is not intended to provide medical or healthcare advice. All allergy or medical-related questions and concerns, including health concerns relating to possible mold or VOCs exposure, should be directed to a qualified physician.

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