



EDLab
Environmental Diagnostics Laboratory

May 10, 2010

Jane Example
1234 Sample St.
Anywhere, US 54321

Re: **1234 Sample St.**
Laboratory Analysis Report
Work Authorization # 05616- XXXXXX



**Laboratory
Advisory Board**

- Alan L. Wozniak, CIAQP
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Allergist / Immunologist
Medical Consultant
- Arun Kapoor, MD
Occupational Medicine

Dear Jane Example,

We appreciate the opportunity to provide you with our professional indoor environmental laboratory services. The following environmental assays were performed on the samples submitted by you:

- **Aerobiology (Spore Trap Assays)** - airborne fungal elements, insect biodebris, pollen, fibers, skin cell fragments, etc.
- **Surface Microscopy (Tape Prep Assays)** - precipitated fungal elements, insect biodebris, pollen, fibers, skin cell fragments, etc.
- **Formaldehyde Screen Check**
The U.S. EPA and The American Lung Association recommend a maximum level of 0.1 ppm (parts per million) for formaldehyde in indoor air. Because some people may be sensitive to lower concentrations, the Agency for Toxic Substance and Disease Registry has recommended Minimum Risk Levels (MRL's) that depend on the duration of personal exposure. There are no significant health effects in most people for the MRLs: MRL=0.04ppm (1 to 14 days exposure); MRL=0.03ppm (14 to 364 days exposure); MRL=0.008ppm (365 or more days exposure)

- **Organic Vapor Screen Check**
The OSHA permissible exposure limits based on an 8 hour period are: Acetone - 1,000 ppm; Pentane - 1,000 ppm; Toluene - 200 ppm. The levels measured are low compared to the exposure limits. The chemicals tested are listed on the next page. The chemicals that are not reported are not detected. No concentration is above 0.03 ppm.

Please call me at 1-800-422-7873, ext. 301, should you have any questions. We look forward in assisting you to create a healthy indoor environment for you and your organization.

Sincerely,

Dr. Rajiv Sahay, CIAQP, FIAS
EDL Laboratory Director



Corporate Office

4911 Creekside Drive • Suite C • Clearwater, FL 33760 • (727) 572-4550 • Toll Free 1-800-422-7873 • Fax: (727) 572-5859
Email: laboratory@pureaircontrols.com • Website: www.pureaircontrols.com



LIST OF AVAILABLE CHEMICAL TESTS FOR IEQ

Full Scan Organic Vapors

This test will identify and estimate the concentration of each of the chemicals listed below:

Acetic Acid	Cyclohexane	2 – Ethoxyethyl	Methyl-t-butyl Ether
Acetone	Cyclohexanol	Ether	Methylene Chloride
Acetonitrile	Cyclohexanone	Formamide	Petane
Acrylonitrile	1, 2 Dichloroethane	Heptane	Perchloroethylene
Allyl Chloride	Dimethyl Formamide	Hexane	Pyridine
Benzene	Dimethyl Sulfoxide	Hexone (MIBK)	Styrene
2- Butanone (MEK)	Dioxane	Isobutyl Alcohol	Tetrahydrofuran
Butyl Cellosolve	Dipropylene Glycol	Isopropyl Alcohol	Methyl Ether
Butyl Acetate	Trichloroethylene	Isooctane	Vinyl Acetate
Butyl Carbitol	Ethyl Acetate	Methyl Acrylate	Toluene
Carbon Tetrachloride	Ethyl Alcohol	Methyl	Trichloroethane
Cellosolve	Ethyl Benzene	Chloroform	1,2,4 – Trimethylbenzene
Chlorobenzene	Ethyl Ether	Methyl	Xylene
Chloroform	Ethoxyethanol	Methacrylate	

MANY OTHERS ARE AVAILABLE

The above-mentioned chemicals may exist in the home or office. All compounds can be detected at the following levels:

	<u>Exposure Time</u>	
	<u>8 Hours</u>	<u>24 Hours</u>
<u>Organic Vapors</u>		
Lower Limits	0.1 ppm	0.03 ppm
Upper Limits	1000 ppm	300 ppm

“Indoor Air Diagnostic, Environmental Laboratory and Remediation Experts”

Corporate Office

4911 Creekside Drive · Suite C · Clearwater, FL 33760 · (727) 572-4550 · Toll Free: 1-800-422-7873 Ext. 304 · Fax: (727) 572-5859
E-mail: rsahay@pureaircontrols.com · Web Site: www.pureaircontrols.com



Laboratory Analysis Report

Aerobiology

Spore Trap Assay



Client : **Building Health Check,L.L.C.**
 Jobsite : **Jane Example**
 Location : **1234 Sample St.**

PACS ID# : **05616**
 Work Order # : **XXXXXX**
 Project Date : **5/4/2010**

Unit : N/A	Lab Sample# : 69807	Date Lab. Rec'd. : 5/4/2010
Zone : Family Room	Field Sample# : 2	Date Analyzed : 5/6/2010
Test Site : N/A	Sample Date : 4/27/2010	Date Issued : 5/10/2010
Diagnostic Tech : LAB	Sample Time : 6:45 PM	Sample Serial # : 15712428
Sample Type : Microscopic Particle Assay (SporeTrap)		Sampling Device: AirOCell

<u>Particle Identification</u>	<u>Raw Count</u>	<u>Total Count (Cts/m³)</u>	<u>Percent of Total Count</u>
Opaque Particles	144	49400	60.5 %
Skin Cell Fragments	113	19400	23.7 %
Insect Biodetritus	2	44	0.0539 %
Total Fibers	87	1930	2.36 %
Manmade Fibers	87	1930	2.36 %
Total Pollen	5	110	0.135 %
Pollen Grains	4	88	0.108 %
Pinaceae (Pine) Species	1	22	0.0269 %
Total Fungal Elements/Spores	46	1020	1.25 %
Cladosporium species	26	578	0.707 %
Dematiaceous Fungal Spore Elements	9	200	0.245 %
Alternaria species	4	88	0.108 %
Ascospores	3	66	0.0808 %
Basidiospores	1	22	0.0269 %
Chaetomium species	1	22	0.0269 %
Nigrospora species	1	22	0.0269 %
Rust spores	1	22	0.0269 %
Total "Other"	145	9750	11.9 %
Black Particles	121	9220	11.3 %
Reddish-Brown Particles	24	533	0.652 %
Total Counts:	542	81,700	100 %

Comments :

Method of Analysis: EDLAB SOP-7/05001

Detection Limits* : 22 Cts/m³ (Flow rate: 15.00 lpm, Exposure Time: 3.00 minutes, with 31 traverses under 400x Magnification)

*Detection limits may vary with flow rate, exposure time and microscopic fields observed for particle count at a defined magnification.

BDL = Below Detection Limits **N/A** = Not Applicable

The results in this report apply only to the sample(s) specifically listed above and tested at Environmental Diagnostics Laboratory. Unless otherwise noted, samples were received in good condition. Laboratory prepared Quality Control (QC) samples are analyzed with the samples routinely; however, unless a blank (control) is received, the result for the control is not compared. Quantitative data is based on 3 significant figures; Grand Total may not equal 100% due to rounding.

Quality Controlled By :
 Approved By :
Rajiv R. Sahay, Ph.D.



Opaque Particles Identified from Spore Trap Assays



Client : **Building Health Check,L.L.C.**
Jobsite : **Jane Example**

PACS ID# : **05616**
Work Order # : **XXXXXX**

Opaque Particles

These particles may originate from inorganic or organic sources in nature. However, it appears opaque when observed under light microscopy. It has various shape and sizes. It may be regular or irregular in shape. On an average it can be measured less than one micron to well over fifty microns with some exceptions. Commonly these particles include but are not limited to dust & debris, paint, combustions, emission, ash, silica and others.

These particulates are significant from a health/allergy point of view especially in case of respiratory disorder.



Fibers Identified from Spore Trap Assays



Client : **Building Health Check,L.L.C.**
Jobsite : **Jane Example**

PACS ID# : **05616**
Work Order # : XXXXXX

Manmade Fibers

Man-made fibers may come from natural raw materials like cellulose or from synthetic chemicals like rayon, nylon, etc. In indoor environments, some important sources of man made fiber include carpet, cellulose based building materials, clothing, paper and paper products, etc. Size of these fibers varies from a few microns to a few millimeters; however, an average size range may be 1 micron to over 500 microns.

Health implications of these particles are not well described, however some of the man-made fibers are important from an allergy point of view especially for dermal allergy.



Pollen Species Identified from Spore Trap Assays



Client : **Building Health Check,L.L.C.**
Jobsite : **Jane Example**

PACS ID# : **05616**
Work Order # : XXXXXX

Pinaceae (Pine) Species

There are six genera of evergreens that are found primarily in North America: fir (*Abies*); larch, tamarack (*Larix*); spruce (*Picea*); pine (*Pinus*); Douglas fir (*Pseudotsuga*); and hemlock (*Tsuga*). Abundant pollen is produced in the spring and early summer. The large pollen have air bladders which permit them to travel great distances. Rarely does it cause pollinosis [an allergic reaction (hay fever) resulting in a type I antibody-mediated hypersensitivity].

Pollen Grains

Pollen grains are the male reproductive unit of flowering plant usually produced by anthers. They are microscopic particles of various shape (mostly spheroidal or ellipsoidal), sizes (5 micron to more than 200 micron). Pollen grains may also have furrows or pore or both on their surface that helps in their identification.

They can be air-borne and remain in the ambient air depending upon their buoyancy. They may be carried some distance from the immediate vicinity of the parent. Some pollen grains are allergenic in nature.



Client : **Building Health Check,L.L.C.**
Jobsite : **Jane Example**

PACS ID# : **05616**
Work Order # : **XXXXXX**

Dematiaceous Fungal Spore Elements

Fungal spores that are brown to black. No identification to genus level can be made.

Alternaria species

Alternaria species are found worldwide and are very common. The hyphae, conidiophores, and conidia are pigmented olivaceous-brown (dematiaceous). They can be isolated from air, plants ("blackspot" of roses), foodstuffs, soil, carpets, and textiles. They can be an opportunist human pathogen causing a hypersensitivity pneumonitis (woodworker's lung disease) and an immediate-type hypersensitivity -type I (IgE-mediated) extrinsic asthma and disease that is very common in individuals with atopic disease.

Ascospores

A kind of spore produced by the membranes of ascomycetes. Size and shape (circular to elongated) are greatly variable. May be unicellular or multi-cellular in structure. Development takes place within asci (a type of fruiting body), responsible for sexual propagation. Many of the ascospores can become airborne. This classification comprises a very large group of fungi, some allergenic, some rarely pathogenic, some pathogenic to plants only. A more definitive identification requires culturing and growth of the spores on laboratory media.

Basidiospores

Basidiospores are those produced from the basidium of Basidiomycetes. They are almost always produced as four spores / basidium. The most reliable feature that separates basidiospores from ascospores and deuteromycetes spores is the presence of an off-center apiculus where the spores was attached to the basidium. Apart from that basidiospores may be rough or smooth, darkly pigmented or completely clear, spherical, oval, ellipsoidal or hot-dog shaped. Basidiospores seldom exceed 18um in length. Some common basidiospore-producing fungi are rusts, smuts, jelly fungi, and puffball mushrooms. Most of the Basidiomycetes fungi are decomposers where some of them are pathogenic to plant and animals or allergenic in nature.

Chaetomium species

Chaetomium species are found worldwide and may produce an earthy odor. They are an important cause of decay of cotton and other cellulose materials; causes soft rot in wood and fruit rot; and is an important component in the decomposition of plant material in composts. They can be isolated from dung, straw, bird feathers, soil and plants. They may be associated with allergic disease.

Cladosporium species

Cladosporium species are found worldwide and are among the most common fungi found in the air, soil, foodstuffs, paint, textiles, bird feathers, and on plants. The hyphae, conidiophores, and conidia are pigmented olivaceous-brown (dematiaceous). Rarely, they can be an opportunist human pathogen causing chromoblastomycosis. They can cause a hypersensitivity pneumonitis known as "hot tub lung disease" and an immediate-type hypersensitivity-type I (IgE-mediated) extrinsic asthma.

Nigrospora species

Nigrospora species are found worldwide and are common. The hyphae, conidiophores, and conidia are pigmented olivaceous-brown (dematiaceous). They can be isolated from plants, soil, and foodstuffs. There have not been any reports of human infections, however, they can cause allergic disease.



Spores / Fungal Elements Identified from Spore Trap Assays



Client : **Building Health Check,L.L.C.**
Jobsite : **Jane Example**

PACS ID# : **05616**
Work Order # : **XXXXXX**

Rust spores

The spores of a parasite fungus (Basidiomycetes) that form orangish-red or dark colored spots on the leaves and stems of plants. It is called "rust" because of its color. Rust thrives in cool, moist weather, however, reproduction of rust spores occurs throughout the summer months. The fungus usually is not lethal to its host, but may cause stunting and discoloration of the plant. It is not established as a human pathogen.



Other Material Identified from Spore Trap Assays



Client : **Building Health Check,L.L.C.**
Jobsite : **Jane Example**

PACS ID # : **05616**
Work Order # : **XXXXXX**

Black Particles

These microscopic particles may originate from an organic source material. They greatly vary in their shape and sizes depending on their origin. However, an average size ranges between 1-micron to 5-micron with some exceptions. It may be regular or irregular in shape. In the indoor environment some important source/cause of these particles includes but are not limited to combustion, burning of oil & candles, chimney shoot, automobile exhaust, neoprene (rubber compound that applied to the inside surface of fiber glass duct liner), and other organic materials emitted by copier machines, printers, abraded paints etc.

These particles may influence health and hygienic condition of dwellers.

Reddish-Brown Particles

These microscopic particles may originate from in-organic or organic source materials. In indoor environments these particles mainly come by rusting, coarse, weathering of materials etc. They may also be released into the environment due to deterioration of wood or wood products, art and sculpture work etc. These particles greatly vary in their shape and sizes. It can be measured from a few micron to over 100-microns. This particle may be the indicator of moisture problem in indoor environment.

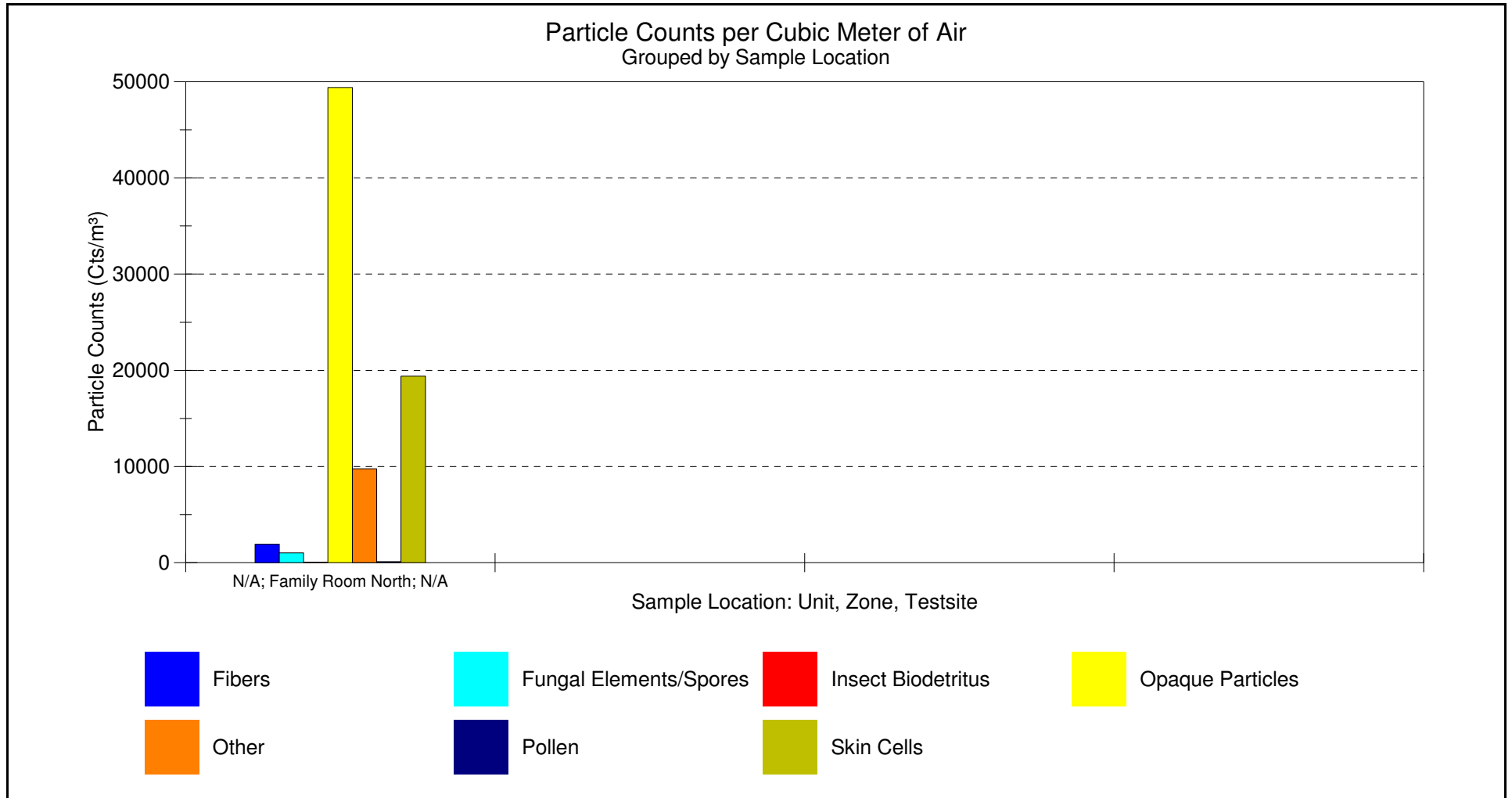
The health implications of this material are not well established however; it may be significant from a health and hygiene point of view.

Laboratory Analysis Chart Aerobiology (Spore Trap Assays)



Client: **Building Health Check,L.L.C.**
 Jobsite: **Jane Example**
 Location: **1234 Sample St.**

Work Order: **XXXXXX**
 PACS ID#: **05616**
 Project Date: **5/4/2010**
 Date Issued: **5/10/2010**

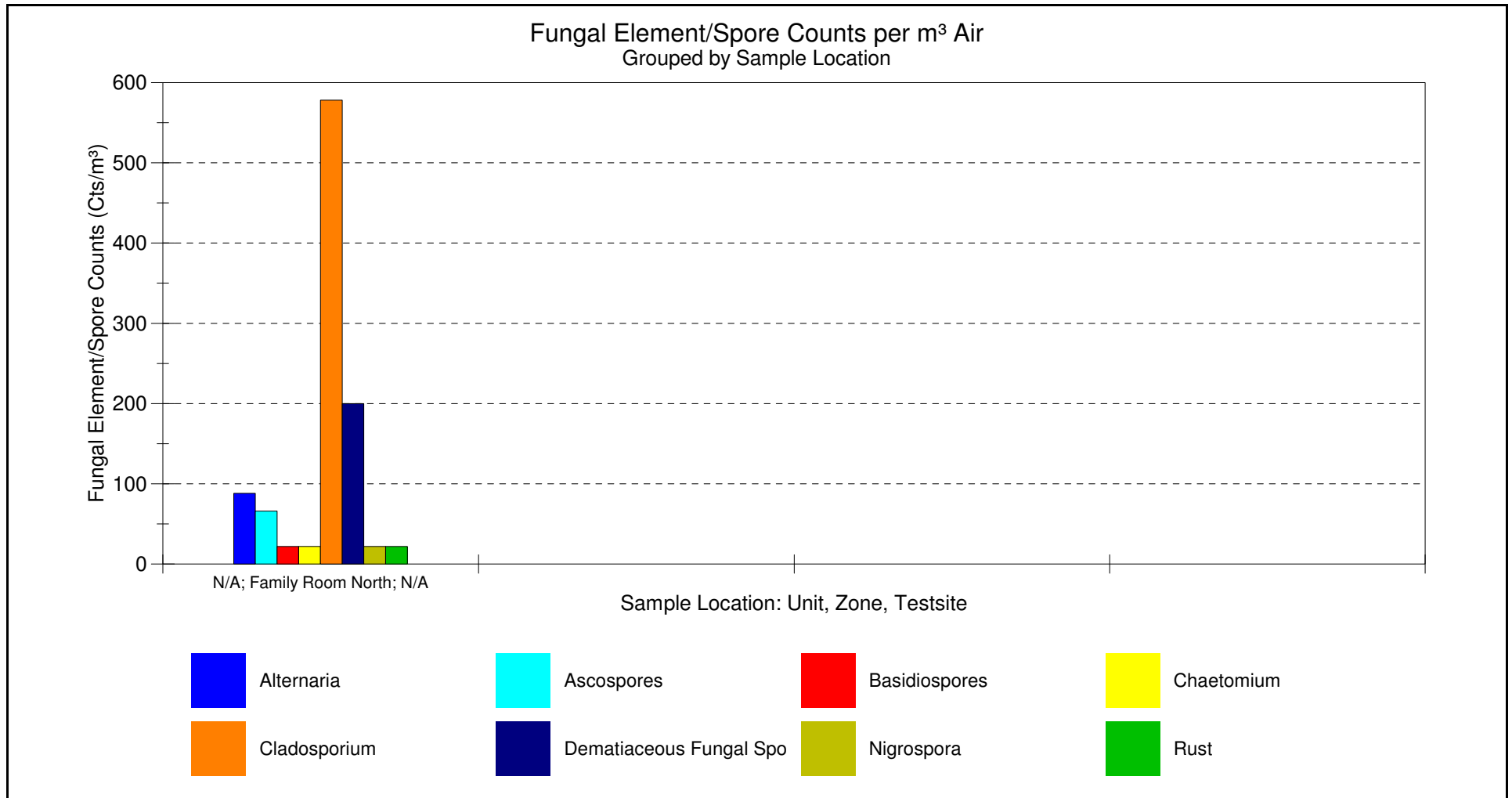


Laboratory Analysis Chart Aerobiology (Spore Trap Assays) Fungal Elements/Spores



Client: **Building Health Check,L.L.C.**
Jobsite: **Jane Example**
Location: **1234 Sample St.**

Work Order: **XXXXXX**
PACS ID#: **05616**
Project Date: **5/4/2010**
Date Issued: **5/10/2010**





Laboratory Analysis Report Surface Microscopy Tape Prep Assay



Client : **Building Health Check,L.L.C.**
 Jobsite : **Jane Example**
 Location : **1234 Sample St.**

PACS ID# : **05616**
 Work Order # : **XXXXXX**
 Project Date : **5/4/2010**

Unit : **N/A**
 Zone : **Family Room**
 Test Site : **Coffee Table**
 Diagnostic Tech : **LAB**
 Sample Type: **TapePrep Assay**

Lab Sample# : **69821**
 Field Sample# : **1**
 Sample Date: **4/27/2010**
 Sample Time: **6:45 PM**



Date Lab. Rec'd. : **5/4/2010**
 Date Analyzed: **5/7/2010**
 Date Issued : **05/10/10**
 Sample Serial #: **28495**

<u>Particle Identification</u>	<u>Raw Count</u>	<u>Total Count (Cts/cm²)</u>	<u>Percent of Total Count</u>
OpaqueParticles	140	3,500	95.9 %
Skin Cell Fragments	21	84	2.30 %
Insect Biodetritus	BDL	BDL	N/A
Total Fibers	3	12	0.329 %
Manmade Fibers	3	12	0.329 %
Total Pollen	BDL	BDL	N/A
Total Fungal Elements/Spores	4	16	0.438 %
Fungal Spore Elements	4	16	0.438 %
Total "Other"	9	36	0.986 %
Intact Dust Mites noted	1	4	0.11 %
Black Particles	8	32	0.88 %
Total Counts:	177	3,650	100 %

Method of Analysis: EDLAB SOP-7/13001

BDL = Below Detection Limit: No particles were reported from the microscopically observed area on the specimen slide (at 10x10 or 10x40 magnification).

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Quality Controlled By : 
 Approved By : 
 Rajiv R. Sahay, Ph.D.



Opaque Particles Identified from Tape Prep Assays



Client : **Building Health Check,L.L.C.**
Jobsite : **Jane Example**

PACS ID# : **05616**
Work Order # : **XXXXXX**

Opaque Particles

These particles may originate from inorganic or organic sources in nature. However, it appears opaque when observed under light microscopy. It has various shape and sizes. It may be regular or irregular in shape. On an average it can be measured less than one micron to well over fifty microns with some exceptions. Commonly these particles include but are not limited to dust & debris, paint, combustions, emission, ash, silica and others.

These particulates are significant from a health/allergy point of view especially in case of respiratory disorder.



Fibers Identified from Tape Prep Assays



Client : **Building Health Check,L.L.C.**
Jobsite : **Jame Example**

PACS ID# : **05616**
Work Order # : **XXXXXX**

Manmade Fibers

Man-made fibers may come from natural raw materials like cellulose or from synthetic chemicals like rayon, nylon, etc. In indoor environments, some important sources of man made fiber include carpet, cellulose based building materials, clothing, paper and paper products, etc. Size of these fibers varies from a few microns to a few millimeters; however, an average size range may be 1 micron to over 500 microns.

Health implications of these particles are not well described, however some of the man-made fibers are important from an allergy point of view especially for dermal allergy.



Spores / Fungal Elements Identified from Tape Prep Assays



Client : **Building Health Check,L.L.C.**
Jobsite : **Jane Example**

PACS ID# : **05616**
Work Order # : **XXXXXX**

Fungal Spore Elements

Fungal spores that are hyaline or colorless. No identification to genus level can be made.



Other Material Identified from Tape Prep Assays



Client : **Building Health Check,L.L.C.**
Jobsite : **Jane Example**

PACS ID # : **05616**
Work Order # : **XXXXXX**

Black Particles

These microscopic particles may originate from an organic source material. They greatly vary in their shape and sizes depending on their origin. However, an average size ranges between 1-micron to 5-micron with some exceptions. It may be regular or irregular in shape. In the indoor environment some important source/cause of these particles includes but are not limited to combustion, burning of oil & candles, chimney shoot, automobile exhaust, neoprene (rubber compound that applied to the inside surface of fiber glass duct liner), and other organic materials emitted by copier machines, printers, abraded paints etc.

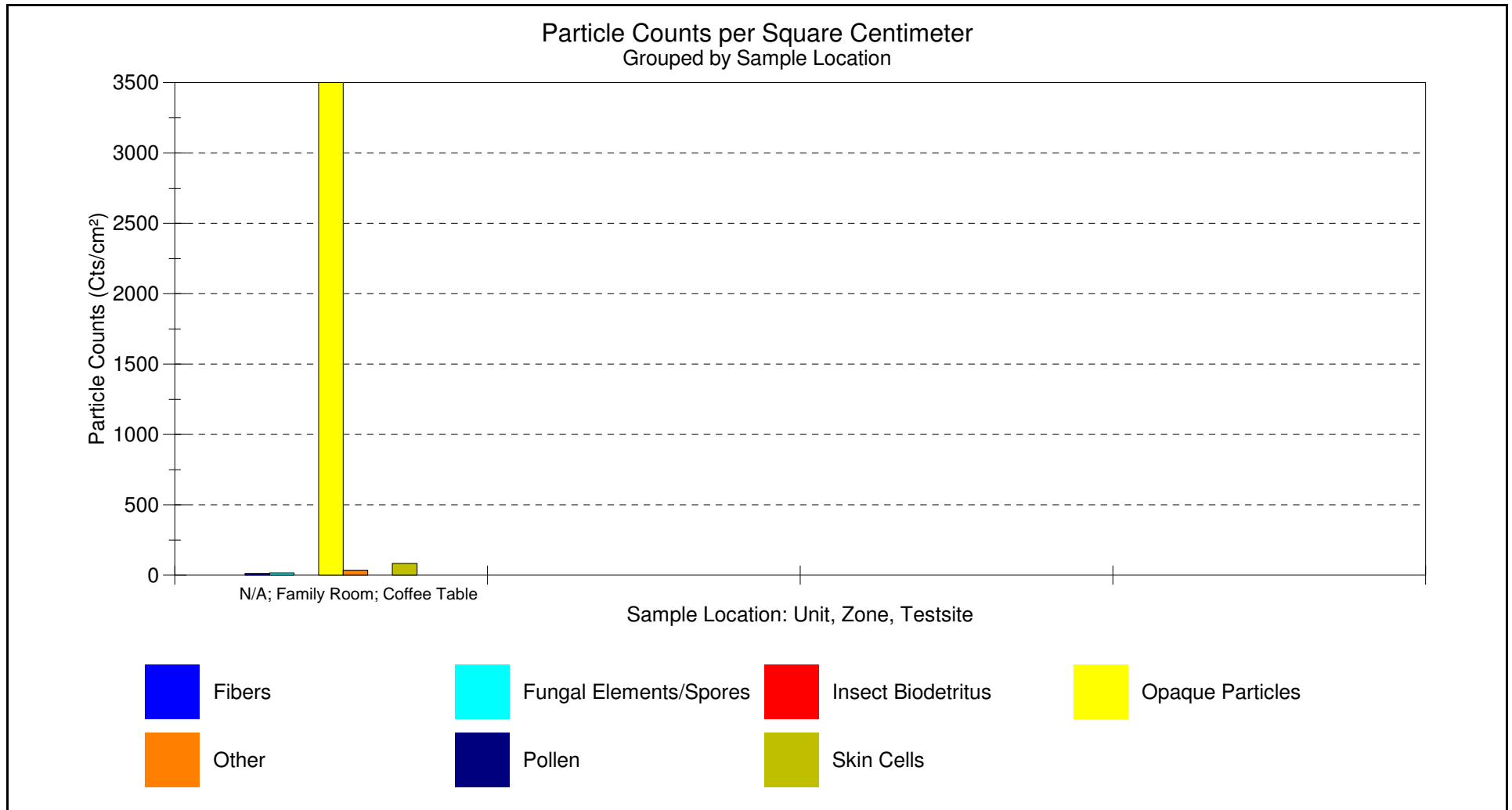
These particles may influence health and hygienic condition of dwellers.

Intact Dust Mites noted

Laboratory Analysis Chart Surface Microscopy (Tape Prep Assays)

Client: **Building Health Check, L.L.C.**
Jobsite: **Jane Example**
Location: **1234 Sample St.**

Work Order: **XXXXXX**
PACS ID#: **05616**
Project Date: **5/4/2010**
Date Issued: **5/10/2010**

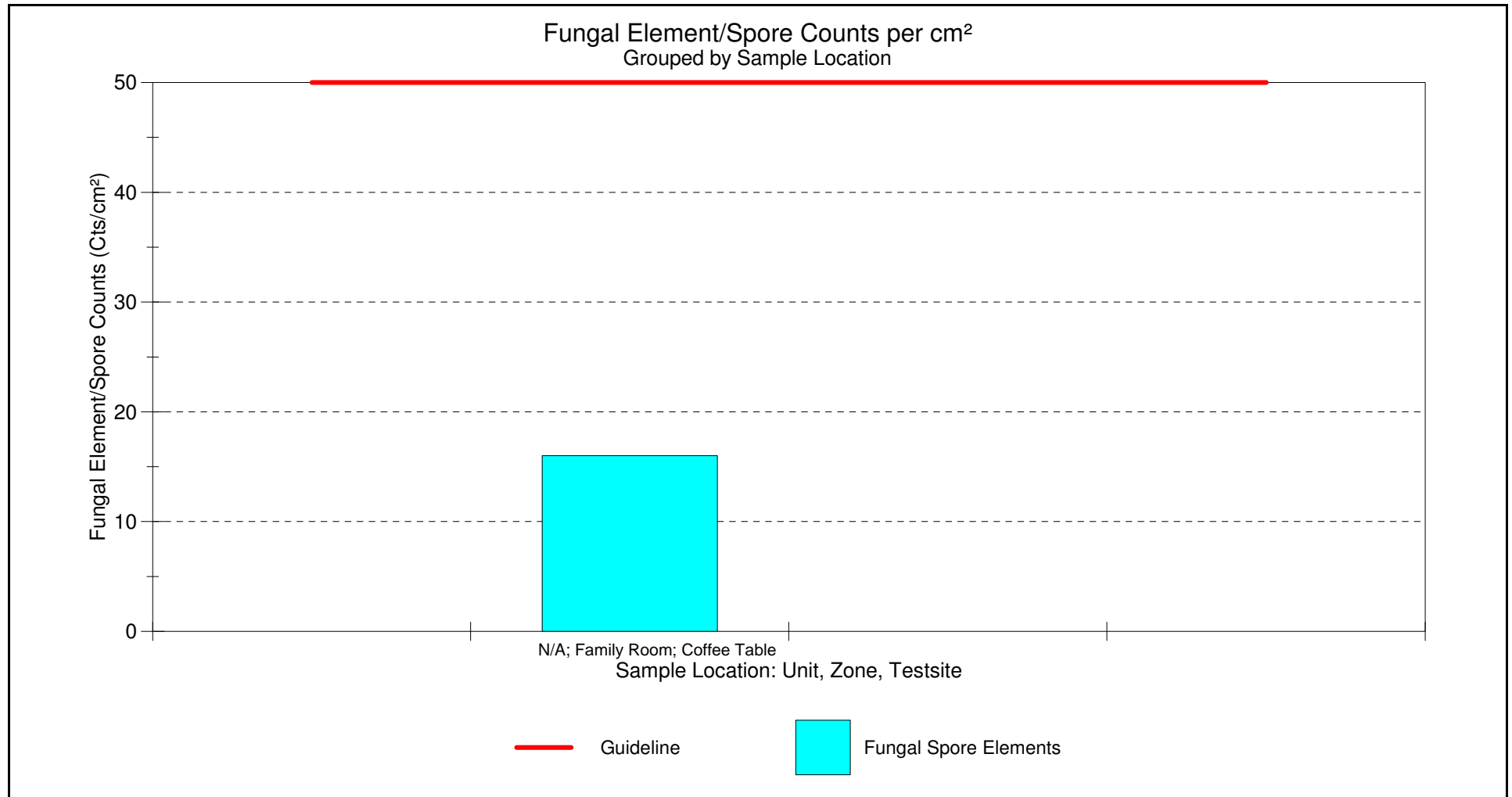


Laboratory Analysis Chart Surface Microscopy (Tape Prep Assays) Fungal Elements/Spores



Client: **Building Health Check,L.L.C.**
 Jobsite: **Jane Example**
 Location: **1234 Sample St.**

Work Order: **XXXXXX**
 PACS ID#: **05616**
 Project Date: **5/4/2010**
 Date Issued: **5/10/2010**





Laboratory Analysis Report "Other" Samples



Client: **Building Health Check,L.L.C.**
 Jobsite: **Jane Example**
 Location : **1234 Sample St.**

PACS ID # : **05616**
 Work Order # : **XXXXXX**
 Project Date : **5/4/2010**
 Date Issued : **5/10/2010**


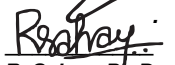
Mech. Unit : **N/A**
 Zone : **Family Room**
 Test Site : **Hung on Mantle**

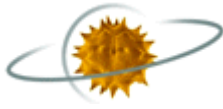
Sample #	Sample Type	Date	Time	Results	Units
69808	Formaldehyde	4/27/2010	7:00 pm	0.03	ppm
69809	Acetone	4/27/2010	7:00 pm	0.019	ppm
69809	Pentane	4/27/2010	7:00 pm	0.004	ppm
69809	Toluene	4/27/2010	7:00 pm	0.032	ppm

ND = None Detected. Results are less than the method detection limit.

<= Less Than or Equal To. The analyte was detected but at a level too low to be accurately quantitated. The actual amount is less than or equal to the reported value.

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Quality Controlled By : 
 Approved By : 
Rajiv R. Sahay, Ph.D.



EDLab
Environmental Diagnostics Laboratory
1-800-422-7873, Ext. 301



Client: **Building Health Check, L.L.C.**
Jobsite: **Jane Example**
Location: **1234 Sample St.**
PACS ID#: **05616**
Work Order #: **XXXXXX**

End of Report



Healthy Home / Building Considerations:

Background: The following Healthy Home / Building options should be considered:

<p>A. <u>Baseline Indoor Air Quality Study:</u></p>	<p>Depending on occupant complaints, perform an independent comprehensive Indoor Air Quality baseline study to determine specificity of indoor pollutants and possible cause / effect relationship of building occupants.</p>
<p>B. <u>Air Conveyance System (ACS):</u></p>	<p>Inspect for cleanliness. Depending on condition, environmentally clean and treat ACS.</p>
<p>C. <u>Air Handler Unit (AHU):</u></p>	<p>Inspect for cleanliness. Depending on condition, environmentally clean and treat AHU; reline with closed cell non-porous material.</p>
<p>D. <u>UV Light:</u></p>	<p>Inspect for application. Typical UV lights (germicidal lamps) mount in the ductwork system or air handling unit and have the ability to control harmful bacteria, mold, viruses, etc. Post cooling coil application is best. UV light should be used in conjunction with high MERV filtration and environmentally clean HVAC systems.</p>
<p>E. <u>AHU Air Filtration:</u></p>	<p>Depending upon present filtration, upgrade to highest ASHRAE standard Minimum Efficacy Reporting Value (MERV) rating available, while maintaining equipment static pressure requirements. A MERV rating of 16 is the highest.</p> <p>Quick Reference to Various Air Filter MERV Ratings:</p> <ul style="list-style-type: none"> • MERV 1 - MERV 4: Throw-Away Fiberglass Media less than 20% @ 3 - 10 microns • MERV 5: Pleated Media Air Filters 20 - 34.9% @ 3 - 10 microns • MERV 10: Pleated Media Air Filters 85% @ 3 - 10 microns • MERV 14: Pleated Media Air Filters 85% - 94.9% @ .3 - 1.0 microns • MERV 16: Pleated Media Air Filters at 95% @ .3 - 1.0 microns <p>Note: The average Particle Size Particulate Efficiency (PSE) rating varies from MERV 1 - 16.</p>
<p>F. <u>HEPA Vacuum Cleaner:</u></p>	<p>Review housekeeping protocols. Depending on present vacuum product, upgrade vacuum cleaner to HEPA fitted at 99.97% efficient at .3 microns.</p>
<p>G. <u>Polytac Prefilter at Return Grills:</u></p>	<p>Install filters to arrest large particulates prior to entering the Return Air Duct System.</p>
<p>H. <u>Unit Ventilation System (UVS):</u></p>	<p>UVS's are typically whole house air filtration and ventilators that circulate fresh air into the home every 2-4 hours, while removing potential stale air to the outside.</p>

NOTE: Any remedial activities should be accomplished using strict environmental remediation protocols and performed by a qualified professional.

Please contact at 1-800-422-7873 for further information.