



Dear _____;

Enclosed please find 1) the laboratory results for the subject property located at _____, California 2) an interpretation to aid in understanding the results; and 3) the Inspector's Checklist for the inspection performed on September 5, 2007. To date there are currently no federal, state, or local standards regulating airborne fungal limits. However, federal guidelines and industry standards have been developed to interpret indoor airborne fungal concentrations, they are as follows:

1. The American Industrial Hygiene Association's *Field Guide for the Determination of Biological Contaminants in Environmental Samples* states, "The significant presence of fungi in indoor air not present or as a minor component of the outdoor air mycroflora is taken as unacceptable from a health and building performance point of view."
2. The AIHA *Field Guide* also states that, "Dominance in indoor air of fungal species not predominant in outdoor air indicates that these fungi are growing in a building and that the air quality is degrading."
3. Air samples are evaluated primarily by comparing the types and levels of fungi found indoors, to those present in the outdoor environment. In general, indoor spore levels should be lower than outdoor levels, with the same general distribution of spores. A substantial elevation of a select number of spore types, over what has been identified in the outdoor environment, is typically indicative of an indoor source of mold growth. (See the attached "Interpretation.")

There are over a million types of mold, with only a handful (approximately 100,000) species that have been scientifically identified and studied. The more common molds have been classified into allergens, pathogens or toxins. To learn more about the various molds consult the fungal library at www.emlab.com. The Environmental Protection Agency also offers laymen recommendations for remediation of mold and helpful hints in dealing with mold contamination at www.epa.gov. If we may be of further assistance for additional testing, remediation, or general concerns with your lab results, please feel free to contact us at 1-888-664-MOLD (6653).

Bay Mold Inspections



EMLab P&K

Report for:

Mr. Graham Murdoch
Bay Mold
501 Sutter Street
Folsom, CA 95630

Regarding: Project: Sample report
 EML ID: 333366

Date of Analysis: 09-10-2007

Approved by:

Lab Manager
Dr. Kamashwaran Ramanathan

Project SOPs: Spore trap analysis (100005)

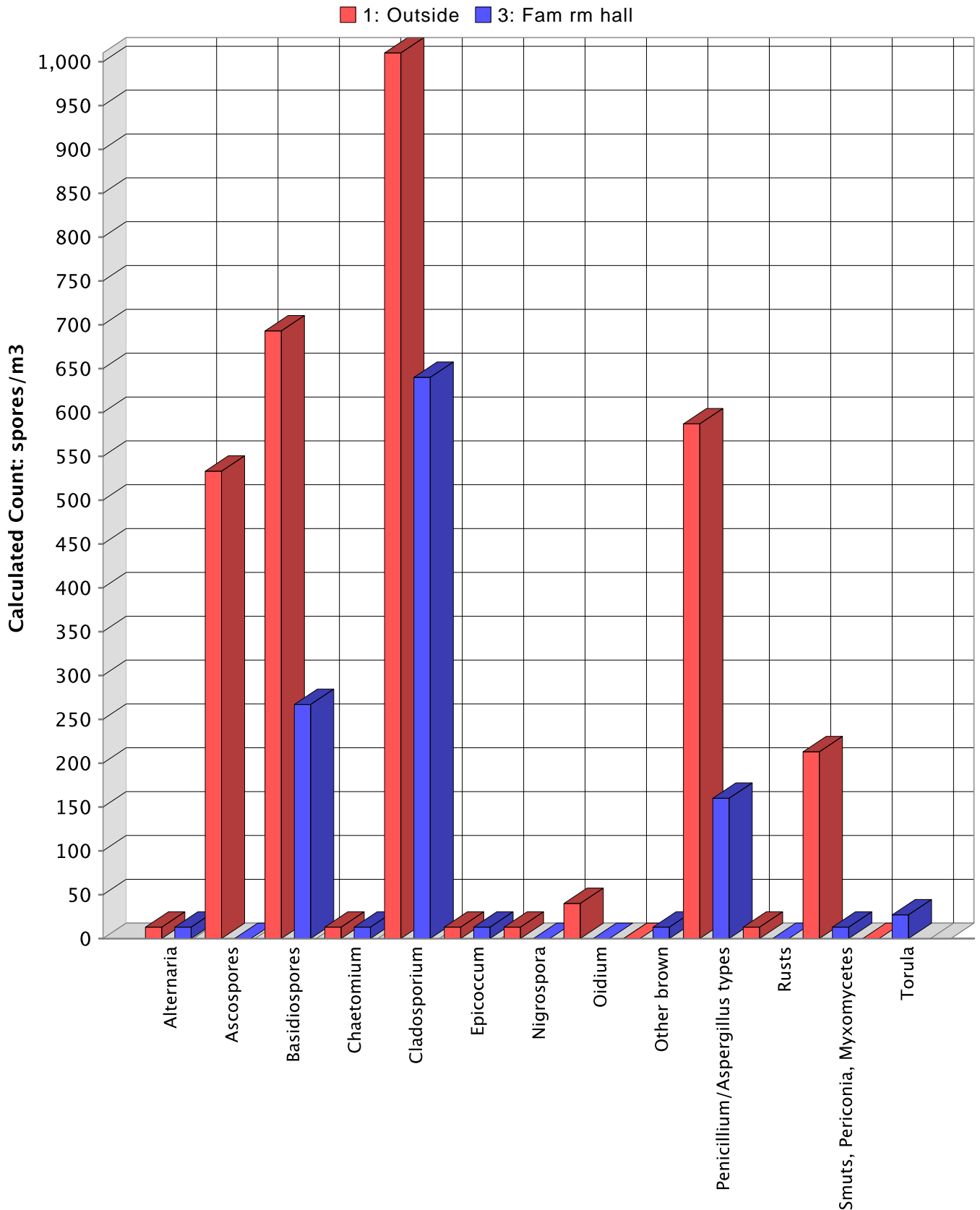
This coversheet is included with your report in order to comply with AIHA and ISO accreditation requirements.

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.

Document Number: 200091 - Revision Number: 5

SPORE TRAP REPORT: NON-VIABLE METHODOLOGY



Comments:

Note: Graphical output may understate the importance of certain "marker" genera.

Client: Bay Mold
C/O: Mr. Graham Murdoch
Re: Sample reportDate of Sampling: 09-04-2007
Date of Receipt: 09-07-2007
Date of Report: 09-10-2007**SPORE TRAP REPORT: NON-VIABLE METHODOLOGY**

Location:	1: Outside		3: Fam rm hall	
Comments (see below)	None		None	
Lab ID-Version‡:	1457224-1		1457225-1	
	raw ct.	spores/m3	raw ct.	spores/m3
Alternaria	1	13	1	13
Arthrinium				
Ascospores*	10	533		
Aureobasidium				
Basidiospores*	13	693	5	267
Bipolaris/Drechslera group				
Botrytis				
Chaetomium	1	13	1	13
Cladosporium	19	1,010	12	640
Curvularia				
Epicoccum	1	13	1	13
Fusarium				
Nigrospora	1	13		
Oidium	3	40		
Other brown			1	13
Penicillium/Aspergillus types†	11	587	3	160
Pithomyces				
Rusts*	1	13		
Smuts*, Periconia, Myxomycetes*	16	213	1	13
Stachybotrys				
Stemphylium				
Torula			2	27
Ulocladium				
Unknown				
Background debris (1-4+)††	2+		2+	
Hyphal fragments/m3	< 13		40	
Pollen/m3	240		40	
Skin cells (1-4+)	1+		2+	
Sample volume (liters)	75		75	
TOTAL SPORE/m3		3,141		1,159

Comments:

* Most of these spore types are not seen with culturable methods (Andersen sampling), although some may appear as non-sporulating fungi. Most of the basidiospores are "mushroom" spores while the rusts and smuts are plant pathogens.

† 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 actually higher than reported. Background debris also affects the reporting limit for some spore types. The reporting limit is dependent on spore size, background debris, sample volume, and the percentage of the trace analyzed. It is important to account for sample volumes when evaluating dust levels.

When detected, the minimum detection and reporting limit is a raw count of 1. The minimum detection value when multiplied by 1000 and divided by the sample volume collected provides the analytical sensitivity in counts/m3 for the sample analyzed.

‡ A "Version" greater than 1 indicates amended data.

Client: Bay Mold
C/O: Mr. Graham Murdoch
Re: Sample report

Date of Sampling: 09-04-2007
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MoldRANGE™: Extended Outdoor Comparison**Outdoor Location: 1, Outside**

Fungi Identified	Outdoor data	Typical Outdoor Data by Date†				Typical Outdoor Data by Location‡			
		Month: September				State: CA			
	spores/m3	low	med	high	freq %	low	med	high	freq %
Generally able to grow indoors*									
Alternaria	13	7	33	490	64	7	27	230	61
Bipolaris/Drechslera group	-	7	13	190	26	7	13	110	14
Chaetomium	13	7	13	120	16	7	13	110	18
Cladosporium	1,010	53	800	11,000	98	53	640	6,300	98
Curvularia	-	7	27	670	29	7	13	190	6
Epicoccum	13	7	25	440	28	7	13	150	20
Nigrospora	13	7	14	290	24	7	13	180	7
Penicillium/Aspergillus types	587	50	280	3,400	92	48	210	2,600	87
Stachybotrys	-	7	13	160	4	7	13	350	5
Torula	-	7	13	120	15	7	13	150	13
Seldom found growing indoors**									
Ascospores	533	13	170	5,800	81	13	110	1,900	73
Basidiospores	693	13	370	22,000	95	13	240	6,900	94
Oidium	40	7	13	160	15	7	13	190	21
Rusts	13	7	25	330	30	7	20	280	31
Smuts, Periconia, Myxomycetes	213	10	53	730	81	10	40	510	73
TOTAL SPORES/M3	3,141								

† The Typical Outdoor Data by Date represents the typical outdoor spore levels across North America for the month indicated. The last column represents the frequency of occurrence. The low, medium, and high values represent the 2.5, 50, and 97.5 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, 2.5% of the time it is present in levels above the detection limit and below 53 spores/m3. These values are updated periodically, and if enough data is not available to make a statistically meaningful assessment, it is indicated with a dash.

‡ The Typical Outdoor Data by Location represents the typical outdoor spore levels for the region indicated for the entire year. As with the Typical Outdoor Data by Date, the four columns represent the frequency of occurrence and the typical low, medium, and high concentration values for the spore type indicated. These values are updated periodically, and if enough data is not available to make a statistically meaningful assessment, it is indicated with a dash.

*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.

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 data" 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. In addition, EMLab P&K may not have received and tested a representative number of samples for every region or time period. EMLab P&K hereby disclaims any liability for any and all direct, indirect, punitive, incidental, special or consequential damages arising out of the use or interpretation of the data contained in, or any actions taken or omitted in reliance upon, this report.

Client: Bay Mold
 C/O: Mr. Graham Murdoch
 Re: Sample report

Date of Sampling: 09-04-2007
 Date of Receipt: 09-07-2007
 Date of Report: 09-10-2007

MoldSTAT™: Supplementary Statistical Spore Trap Report

Outdoor Summary: 1: Outside

Species detected	Outdoor sample spores/m3				Typical outdoor ranges (North America)	Freq. %
	<100	1K	10K	>100K		
Alternaria				13	7 - 27 - 370	55
Ascospores				533	13 - 160 - 4,300	76
Basidiospores				693	13 - 320 - 14,000	93
Chaetomium				13	7 - 13 - 120	13
Cladosporium				1,010	53 - 530 - 8,300	95
Epicoccum				13	7 - 13 - 280	23
Nigrospora				13	7 - 13 - 230	13
Oidium				40	7 - 13 - 210	16
Penicillium/Aspergillus types				587	27 - 210 - 2,600	87
Rusts				13	7 - 13 - 280	23
Smuts, Periconia, Myxomycetes				213	7 - 40 - 760	70
Total				3,141		

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 occurrence 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: 3: Fam rm hall

% of outdoor total spores/m3	Friedman chi-square* (indoor variation)	Agreement ratio** (indoor/outdoor)	Spearman rank correlation*** (indoor/outdoor)	MoldSCORE**** (indoor/outdoor)
Result: 36%	dF: N/A Result: N/A Critical value: N/A Inside Similar: N/A	Result: 0.7000	dF: 13 Result: 0.4025 Critical value: 0.4780 Outside Similar: No	Score: 122 Result: Low

Species Detected	Spores/m3			
	<100	1K	10K	>100K
Alternaria				13
Basidiospores				267
Chaetomium				13
Cladosporium				640
Epicoccum				13
Other brown				13
Penicillium/Aspergillus types				160
Smuts, Periconia, Myxomycetes				13
Torula				27
Total				1,159

Client: Bay Mold
C/O: Mr. Graham Murdoch
Re: Sample report

Date of Sampling: 09-04-2007
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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&K reserves the right to, and may at anytime, modify or change the MoldScore algorithm without notice.

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INTERPRETATION

Air Sampling

Our philosophy regarding the interpretation of biological air samples is formed primarily by two guiding principles. First, an effective interpretation is based on the comparison of indoor and outdoor samples. There are currently no guidelines of regulations to indicate “safe” or “normal” spore levels, however, we typically expect indoor counts to be 30 to 80% of outdoor spore counts, with the same general distribution of spore types present. Indoor and outdoor spore level comparisons should also be evaluated with an awareness of the building type, activity level, and weather conditions present at the time of sampling. And second, variation is an inherent part of biological air sampling. The presence or absence of a few genera in small numbers should not be considered abnormal.

Surface Sampling

Mold growth is quickly and accurately identified by a direct microscopic examination of the surface. Growth is determined by noting the presence of clumps or chains of spores accompanied by underlying mycelial fragments and sporulating structures. The appearance resembles that of a “culture.”

When mold growth is present indoors, many more spores of a particular type will be found trapped on surfaces. These spores may be in forms which indicate recent spore release (close proximity), such as spores in chains or clumps. Marker genera are those spore types which are present normally in very small numbers, but which multiply indoors when conditions are favorable for growth. These would include cellulose digestors such as *Chaetomium*, *Stachybotrys*, and *Torula*. While a single *Stachybotrys* spore is occasionally seen as part of the normal outdoor flora, finding 5 or 6 of these spores on a single tape lift from a duct surface is an indicator that *Stachybotrys* may be growing indoors.

Weather

Rain washes the air clean of many spore types while it assists in the dispersion of others. Sampling on rainy, foggy, or very humid days may result in outdoor counts which are low or which have a significantly different distribution of spore types. Generally, rainy day microflora differs from dry, sunny microflora in that levels of ascospores and basidiospores may be increased (sometimes greatly increased). Non-viable methods will reflect this directly with increased counts of ascospores and basidiospores. Culturable (Andersen) sampling may result in increased counts of non-sporulating colonies since many ascospores and basidiospores will not sporulate in culture.

Sampling on days when there are strong winds also creates problems. Outside counts may be significantly higher than on non-windy days. High outdoor counts may mask small to moderate indoor mold problems since the interpretation is made on the basis of an indoor-outdoor spore count ratio.

Activity levels

The activity level of a particular environment at the time of sampling will likely affect the data collected by that sampling. Indoor spore levels usually average 30 to 80% of the outdoor spore level at the time of sampling, with the same general distribution of spore types. Filtered air, air-conditioned air, or air remote from outside sources may average 5 to 15% of the outside air at the time of sampling. These percentages are guidelines, only. The major factor is the accessibility of outdoor air. A residence with open doors and windows with heavy foot traffic may average 95% of the outdoor level, while high rise office buildings with little air exchange may average 2%. In addition, dusty interiors may exceed 100% of the outdoors to some degree, but will still mirror the outdoor distribution of spore types.

Utilizing aggressive or semi-aggressive sampling methods typically increases the number of spores on sampling media. While these techniques may help to provide an indication of past problems with mold growth, aggressive sampling compounds problems with interpretation because the comparison between an aggressively taken sample and the outdoor air is less meaningful.

Condition of the area sampled

The value of field observations in the assessment of indoor air quality complaints cannot be overstated. Laboratory results present only one aspect of the entire picture. An effective evaluation needs to take into account the condition of the area or building in question. Potential field considerations include:

- General cleanliness of the area.
- Are doors and windows kept open or closed?
- Is the HVAC system well maintained?
- Is there an indoor source of water or high relative humidity?
- Was there a previous problem with excessive water or high relative humidity?
- Are there areas of visible mold growth or musty odors present?¹

INSPECTION CHECK LIST

Client: _____
Inspector: **Graham Murdoch**
Date: **September 5, 2007**
Property Address: _____

Exterior inspection:
External humidity reading: **29%**
Weather conditions: **Sunny.**
Outside temperature: **86 degrees Fahrenheit**
Home/Business Description: **Single-story residence with stucco exterior and composition roofing (a portion of the roof is flat-top). Outside air sample recommended.**

Exterior inspection:

1. Was dry rot visible in eaves along, wood siding, etc. If so, where?
No.
2. Was there dirt up to stucco line, siding or weepscreed? If so, where?
N/A.
3. Was there concrete against exterior of home that could allow standing water to run in through exterior wall?
Yes, at rear patio – sheds toward side of home. Cracks in patio cement.
4. Is the residence or building on a slope?
No.
5. Is the driveway sloped toward the residence, and if so does the client experience standing water in the garage?
No.
6. Is there visible standing water near the home/building?
No.
- 7A. Is there excess shrubbery or roots flush with the exterior walls of the residence or building?
No.



- 7B. If shrubbery exists, does it interfere with windows, allowing for mold to permeate through screens, create a musty odor, etc?
All foliage should be trimmed away from residence six to eight inches to avoid water intrusion points and ventilation of mold spores and allergens through windows, screens and doors, and exterior surfaces. Plants should not be flush with exterior wall surfaces.
8. Is there sufficient foundation/crawlspace ventilation? (For every 150 square foot of building there should be 1 square foot of vent.)
Yes.
9. Is the exterior paint blistered?
No – some cracking in stucco. Crack on left side of home next to side door above window needs to be repaired.
10. Are the gutters or downspouts clogged.
No – some downspouts are missing.

Interior inspection:

- Living Room (front of residence w/fireplace, wood flooring)**
Visible mold, odor or standing water? ***Brick at base of fireplace (at floor) have hidden moisture and water staining. Also, wood flooring at left and right sides of fire please shows some delamination in joints.***
Humidity reading: ***32%***
Test Recommended? ***Yes, air sample recommended.***
- Family Room (rear of residence, carpet)**
Visible mold, odor or standing water? ***OK.***
Humidity reading: ***33%***
Test Recommended? ***Yes, air sample recommended.***
- Dining Room (wood flooring)**
Visible mold, odor or standing water? ***OK.***
Humidity reading: ***32%***
Test Recommended? ***No.***
- Kitchen (linoleum)**
Humidity reading: ***32%***
Visible mold, odor or standing water? ***Past sheetrock repair to back wall under sink in cabinet.***
Test Recommended? ***No.***



5. **Laundry Room**
Humidity reading: **32%**
Visible mold, odor or standing water? **OK.**
Test Recommended? **No.**

6. **Guest Bathroom**
Humidity reading: **34%**
Visible mold, odor or standing water? **Rust on window screening with visible mold at windowsill – due to lack of ventilation in bathroom. Visible mold staining on sink on wood below stainless steel.**
Test Recommended? **Yes, tape lift from windowsill and under vanity recommended.**

7. **Bedroom #1 (pine room w/heater closet)**
Closet? **OK.**
Humidity reading: **32%**
Visible mold, odor or standing water? **OK.**
Test Recommended? **No.**

8. **Bedroom #2 (right side at middle)**
Closet? **OK – attic access.**
Humidity reading: **32%**
Visible mold, odor or standing water? **OK.**
Test Recommended? **Yes, air sample recommended.**

9. **Bedroom #3 (front, right side)**
Closet? **OK.**
Humidity reading: **33%**
Visible mold, odor or standing water? **OK.**
Test Recommended? **Yes, air sample recommended.**

10. **Master Bathroom (right side at rear, linoleum)**
Humidity reading: **32%**
Visible mold, odor or standing water? **OK.**
Test Recommended? **No.**

11. **Master Bedroom**
Closets? **OK.**
Humidity reading: **32%**
Visible mold, odor or standing water? **OK.**
Test Recommended? **Yes, air sample recommended.**



12. **HVAC**
Number of systems? **1**
Visible mold, odor or standing water? **OK.**
Test Recommended? **No.**
13. **Garage (with full shop)**
Humidity reading: **33%**
Visible mold, odor or standing water? **OK.**
Test Recommended? **No.**
14. **Hot Water Heater (laundry room):** Rust or dripping? **Rust on bottom of appliance.** Does there appear to be any rust building up on the bottom of the appliance? **Unit should be replaced as soon as possible as it may rust out and leak.**
Visible mold, odor or standing water? **OK.**
Test Recommended? **No.**
15. **Attic**
Insulated? **No.**
Visible mold, odor or standing water? **OK.**
Test Recommended? **No.**

Summary:

Based on the outcome of the laboratory results, there was little or no indication of airborne mold contamination to the residence. The mold levels fell within the recommended guidelines of 30 to 80% of the outside levels and were primarily allergen molds. In addition, the "Supplementary Statistical Spore Trap Report" provided a grading of "low" which indicates that mold levels within the residence are more likely a result of external molds ventilating through the residence versus molds resulting from mold damage within the residence.

In terms of the residence, there were a few areas of concern that may result in water or moisture damage issues, including the hot water heater which should probably be replaced as soon as possible, and the guest bathroom which, due to a lack of ventilation, resulted in rust and mold staining at the window. A high-speed fan as well as keeping the window open, are options to resolving this issue. In addition visible mold staining was evident below in the bathroom vanity which should also be addressed as an ongoing leak may be present.

