

**MOLD REMEDIATION
POST - REMEDIATION VERIFICATION (CLEARANCE) REPORT**

**402 PRECIOUS
SAN ANTONIO, TEXAS**

Prepared for

**SAN ANTONIO HOUSING AUTHORITY
SAN ANTONIO, TEXAS**

by

ETC INFORMATION SERVICES, LLC

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Project No. 7A-020
April 3, 2008

Mr. Timothy Alcott
San Antonio Housing Authority
1315 N. Elmendorf
San Antonio, Texas 78207

**Re: Post - Remediation Verification (Clearance) Report
402 Precious, San Antonio, Texas**

Dear Mr. Alcott:

A copy of the report for the Post - Remediation Verification (Clearance) investigation of the referenced property is being forwarded to you for your information and necessary action. An Indoor Environmental Quality Evaluation was completed for this residence on April 30, 2007, and a Mold Remediation Protocol was prepared on June 2, 2007. The Indoor Environmental Quality Evaluation report and Protocol should be consulted for a full review of the scope of remediation work.

The sources of water intrusion in this house have been corrected. The results of this investigation indicated that remediation was successful and that the house is ready for occupancy.

We will be happy to answer any questions concerning this report. It has been a pleasure working with you on this important assignment. We look forward to being of continuing service to you.

Sincerely,

ETC INFORMATION SERVICES, LLC

Donald J. Schaezler, Ph.D., P.E., CIH
President

1.0 INTRODUCTION

The subject residence has been recently inspected and sampled for remediation of water damage and mold contamination. The purpose of the inspection was to determine the status of remediation by visual inspection, measurement of moisture content in building materials, and collection of air and surface samples. The purpose of this letter is to summarize the results of the inspection and to document that the remediation has been successfully completed.

2.0 Background

A previous report by ETC Information Services, LLC, (“Indoor Environmental Quality Evaluation,” prepared for SAHA by ETC Information Services, LLC, April 30 2007) recommended remediation by a licensed contractor. A Remediation Protocol was also prepared June 2, 2007, and was the basis for the remediation conducted by Blackmon-Mooring of San Antonio, Texas.

Remediation was necessary because of high moisture readings, visible water damage and/or mold on the carpet and lower walls in the master bedroom, master bedroom closet, in bedroom 2 and 3, in the living room around the windows and around the back door.

On December 20, 2007, the following observations were made at the subject residence:

1. Removal work had just been completed in the Master Closet, framing was moist with bleach solution and clearance sampling could not be done
2. The lower sheetrock wall at the right exterior wall of the closet had not been removed as specified.
3. The exposed front and left walls of the closet were visibly clean.
4. The framing at the back door that needed recleaning had been removed and replaced; no sampling was necessary, and remediation is complete in this area.
5. The new framing was not installed correctly. There was temporary shoring, the new sill plate was not treated wood and was not placed over felt paper or equivalent material. It was not anchored to the slab and was not aligned with the existing sill plate.
6. The framing on the other side of the doorway is temporary and must be reconstructed.
7. Sheathing and moisture barrier material has not yet been repaired.

On January 25, 2008, the residence was again inspected, and the following recommendations were made:

1. Remove interior finish to expose lower framing, moisture barrier, and flashing at the right side of the back door. Make repairs as necessary.
2. Do final cleaning after items 1.
3. Perform clearance testing by sampling indoor air and by collecting an inner wall sample at the right wall of the Master Closet. Inspect exposed wall cavities at the back door.
4. Complete removal of all old tackboards, removal of old AHU and ductwork and installation of new items, and movement of the HWH to the Garage.

It was confirmed in February and early March 2008 that the above work had been completed satisfactorily.

On March 27, 2008, clearance sampling was performed at the subject residence. The results of these samples are the subject of this report.

2.0 Observations

2.1 March 27, 2008

1. The house was now visibly clean and apparently ready to occupy.
2. Indoor air quality in the residence was as indicated in the table below.

Location	Temperature °F	Relative Humidity %	Dew Point °F	Carbon Dioxide ppmv	Carbon Monoxide ppmv
Outside	68.1	56	51	340	0
Kitchen	71.7	56	54	340	0
Return Air	70.6	56	54	352	0
Master Bedroom	72.3	54	54	392	0

The results were satisfactory.

4.0 Sampling and Discussion

4.1 March 27, 2008

4.1.1 Air Samples

Ten air samples, five spore traps and five culture plates, were taken at this residence. One sample of each type was taken in the Kitchen, at the return air, and in the Master Bedroom. Four samples were collected from outdoor air for reference. The results are summarized in the tables at the end of this report. The results and their significance are summarized below:

1. Outdoor air had typical levels of total fungal spores, dominated by *Cladosporium*. There were low proportions of a variety of other spores.
2. Outdoor air had typical levels of culturable fungi, dominated by *Cladosporium*. A trace amount of *Aspergillus*, *Penicillium*, and non-sporulating fungi was *present*.
3. All indoor spore trap samples were well below the average of the outdoor samples.
4. The results in all areas **were satisfactory**.

In addition to fungi, other particulates in air were measured. The results are summarized in a table at the end of this report. The results and their significance are summarized below:

1. Outdoor air had low levels of epithelial cells with trace amounts of cotton, insect parts and hyphal fragments.
2. Indoor air in all areas tested had moderate levels of epithelial cells, and average levels of hyphal fragments.
3. The results **were satisfactory**.

5.0 Conclusions

1. Remediation of contaminated framing has been successfully completed in all areas.
2. All sheetrock, trim, flooring, and cabinet materials were removed as specified.
3. All surfaces tested or inspected were clean.
4. Indoor air quality was satisfactory with respect to chemical, physical, and fungal parameters.
5. The causes of the water damage and mold contamination that were identified have been remediated.

6.0 Recommendations

1. The residence is ready for occupancy.

**TABLE 1 - BIOAEROSOL SAMPLING RESULTS
MAJOR GENERA/TYPES – MARCH 27, 2008**

Ref. No.	Description-Air Samples	Concentration, Counts/M ³ (%)							
		Asc	Bas	Bi/Dr	Cl	Pn/As	Sm/Myx	Total Fungal Spores	HyF
Outside									
1	Outside Air-Front	0	53 (7)	0	507 (69)	53 (7)	93 (13)	732 (100)	13
5	Outside Air-rear	173 (32)	93 (17)	0	93 (17)	80 (15)	67 (12)	546 (100)	13
Outdoor Average		86	83	0	300	66	180	639	13
Inside									
2	Kitchen	13 (9)	13 (9)	27 (19)	53 (37)	13 (9)	13 (9)	145 (100)	27
3	Return Air	0	13 (20)	0	27 (41)	13 (20)	0	66 (100)	13
4	Master Bedroom	0	0	0	27 (34)	40 (50)	13 (16)	80 (100)	<13
Indoor Average		4	8	9	36	22	8	95	<17
See Table 4 for abbreviations.									

**TABLE 2 – CULTURABLE AIR FUNGI SAMPLING RESULTS
MAJOR GENERA/TYPES – MARCH 27, 2008**

Ref. No.	Description – Air Samples	Concentration, CFU/M ³ (%)					
		As sp.	Cl	NSF	Pn sp.	Y	Total Fungi
Outside							
1	Outside air-front	59	365	59	47	0	542
5	Outside Air-rear	12	284	82	71	0	471
Indoor Average		35	324	70	59	0	506
Inside							
2	Kitchen	12	106	35	24	12	210
3	Return Air	0	47	0	0	0	47
4	Master Bedroom	0	176	12	0	0	212
Indoor Average		4	86	16	8	4	156
See Table 4 for abbreviations.							

**TABLE 3 – OTHER PARTICLES - SAMPLING RESULTS
MARCH 27, 2008**

Ref. No.	Description – Air Samples	Concentration, Counts/M ³ (%)			
		Pollen Total	Other Plant	Skin Cells	Glass Fiber
Outside					
1	Outdoor air	0	0	333	0
Inside					
2	Kitchen	0	0	347	13
3	Master Bedroom	0	0	1,270	53
4	Return Air	0	0	427	27
Average		0	0	681	31
See Table 4 for abbreviations.					

TABLE 4 - ABBREVIATIONS FOR GENERA, SPECIES, AND TYPES OF FUNGI

Abbreviation	Description
Acremonium	<i>Acremonium</i> sp.
Al	<i>Alternaria</i> sp.
An	<i>Aspergillus niger</i>
As	<i>Aspergillus</i> sp.
Asc	Ascocarps or Ascospores, the fruiting bodies of Ascomycetes
Aur	<i>Aureobasidium</i> sp.
Bas	Basidiospores
Bi/Dr	<i>Bipolaris</i> sp. and/or <i>Drechslera</i> sp.
Bo	<i>Botrytis</i> sp.
Chae	<i>Chaetomium</i> sp.
Cl	<i>Cladosporium</i> sp.
Cur	<i>Curvularia</i> sp.
Epicoccum	<i>Epicoccum</i> sp.
Fusarium	<i>Fusarium</i> sp.
HyF	Hyphal fragments
Mem	<i>Memnoniella</i> sp.
Muc	<i>Mucor</i> sp.
Nig	<i>Nigrospora</i> sp.
NSF	Non-sporulating fungi
Pn	<i>Penicillium</i> sp.
Phia	<i>Phialophora</i> sp.
Pi/Ulo	<i>Pithomyces</i> sp. and/or <i>Ulocladium</i> sp.
Pn/As	<i>Penicillium/Aspergillus</i> type spores
Sm/Myx	Smuts, Myxomycetes, or <i>Periconia</i> spores
Spo	<i>Sporotrichum</i> sp.
Sta	<i>Stachybotrys</i> sp.
Syn	<i>Syncephalastrum</i> sp.
Tae	<i>Taeniolella</i> sp.
Tri	<i>Trichoderma</i> sp.
UC	Unclassified conidia
Y	Yeast