

January 28, 2020

# Limited Indoor Environmental Quality Investigation Findings of Initial Assessment

**John Muir Elementary School  
Bungalow A  
2526 Sixth Street  
Santa Monica, CA 90405**

Prepared for:

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FACS Project #PJ44957

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## Executive Summary

Forensic Analytical Consulting Services, Inc., performed a limited indoor environmental quality assessment of classroom Bungalow A at John Muir Elementary School on January 8, 2020. Visible mold growth and conditions conducive to mold growth were not identified during the investigation. Additionally, based on the assessment findings including the results of collected air samples, elevated mold spore levels in the air and on surfaces in the classroom is not suspected. A more complete discussion of findings, conclusions and recommendations is provided below.

## Introduction

Forensic Analytical Consulting Services, Inc. (FACS) was retained by Ms. Toni Consolo of ASCIP on behalf of Santa Monica-Malibu Unified School District (SMMUSD) to perform a limited indoor environmental quality assessment of classroom Bungalow A at John Muir Elementary School located at 2526 Sixth Street in Santa Monica, CA. The assessment was performed by Ms. Madeleine Dangazyan of FACS on January 8, 2020. This report contains the findings and recommendations from our investigation. The purpose of the investigation was to 1) attempt to identify areas of water intrusion and mold growth, 2) identify and evaluate potential explanations, sources and pathways for the symptoms or concerns reported by the occupant, 3) make recommendations regarding corrective actions, and provide information for consideration in assessing risk to occupants.

## Site History

Based on conversations with district representatives, the following history relative to water intrusion and mold growth was developed.

- The subject room is a preschool classroom with dedicated restroom. Reportedly, a water leak occurred in the restroom several months ago.
- According to district representatives, the leak has since been repaired.
- Staff have reported musty/mildew odor, particularly when the room is first opened in the morning. Staff have reported experiencing adverse health effects while occupying the room (i.e. upper respiratory tract irritation, sore throat, headache, itchy and watery eyes). The symptoms reportedly subside when staff is away from the subject classroom (i.e. weekends).
- On January 8, 2020, FACS conducted an initial mold and moisture assessment of the subject classroom.

## Site Characterization

The subject property is characterized as follows (characterization limited to areas inspected):

Address:	2526 Sixth Street, Santa Monica, CA 90405
Bldg. Type/Use:	Portable classroom
Foundation:	Raised with crawl space
Flooring:	Vinyl tile throughout classroom; rolled vinyl in restroom
Walls:	Pressboard over gypsum wallboard
Ceiling:	2' x 4' suspended ceiling tiles
Roof:	Flat
HVAC:	Wall-mounted package air handling unit
Setting:	Residential neighborhood
Landscaping:	Light vegetation

## Scope of Work

In the course of this project, FACS conducted the following scope of work:

1. Development of a site characterization and history (see sections above).
2. Visual assessment of accessible areas of the interior and exterior of the subject classroom and dedicated restroom.
3. Selective moisture meter assessment of materials in inspected areas.
4. Visual assessment of accessible components of the air handling unit (AHU).
5. Collection of spore trap air samples in two (2) indoor locations and two (2) outdoor locations. The indoor sampling location were selected to be representative of the classroom. Outdoor sampling locations were selected to be representative of air entering the building.

## Conclusions and Recommendations Summary

Based on this investigation, the following summary conclusions and recommendations are reached:

With regard to classroom Bungalow A, visible mold growth and conditions conducive to mold growth were not identified. Additionally, elevated mold spore levels in the air and in settled dust on surfaces in classroom Bungalow A is not suspected. This conclusion is based on the absence of visible mold as well as results of indoor air samples which demonstrated significantly lower concentrations in the classroom when compared to the outdoor control samples on the day of sampling.

Other notable findings identified during the site assessment included the observance of heavy dust loading on horizontal surfaces and window tracks in the subject classroom. Additionally, debris was observed on the area rugs and vinyl flooring. Heavy spider web accumulation was observed under the sink. These excessive dust/particulates can potentially become airborne if disturbed and may contribute to undesirable indoor air quality. Conditions that warrant corrective actions.

Specific findings, conclusions and recommendations are provided in Table 1.

Refer to information regarding mold assessments in the “FACS General Mold Assessment Guidelines” included in the appendices of this report. Per these guidelines, mold growth can appear on moisture impacted building materials within 24-48 hours. As such, efforts should be made to dry moisture impacted materials and correct the underlying cause of moisture in order to prevent mold growth from occurring.

Refer to information regarding mold remediation in the “FACS General Mold Remediation Guidelines” included in the appendices of this report. Per these guidelines, mold remediation should proceed as follows:

- 1) perform all work per appropriate mold remediation guidelines,
- 2) evaluate materials to be removed for hazardous building materials,
- 3) conduct invasive inspection to determine scope of removal,
- 4) remove impacted building materials per scope,
- 5) perform detail cleaning of the work areas,
- 6) ensure all wet building materials are dry,
- 7) conduct post-remediation assessment, and
- 8) ensure the cause of moisture intrusion has been addressed.

## Limitations

This investigation is limited to the conditions and practices observed and information made available to FACS. The methods, conclusions and recommendations provided are based on FACS' judgment, expertise and the standard of practice for professional service. They are subject to the limitations and variability inherent in the methodology employed. As with all environmental investigations, this investigation is limited to the defined scope and does not purport to set forth all hazards, nor indicate that other hazards do not exist.

Please do not hesitate to contact our offices at 310-668-5600 with any questions or concerns. Thank you for the opportunity to assist ASCIP and SMMUSD in promoting a more healthful environment.

Respectfully,  
FORENSIC ANALYTICAL



Madeleine Dangazyan, MS  
Project Manager

Reviewed by:  
FORENSIC ANALYTICAL



Michelle Rosales, MPH, CIH  
Senior Project Manager



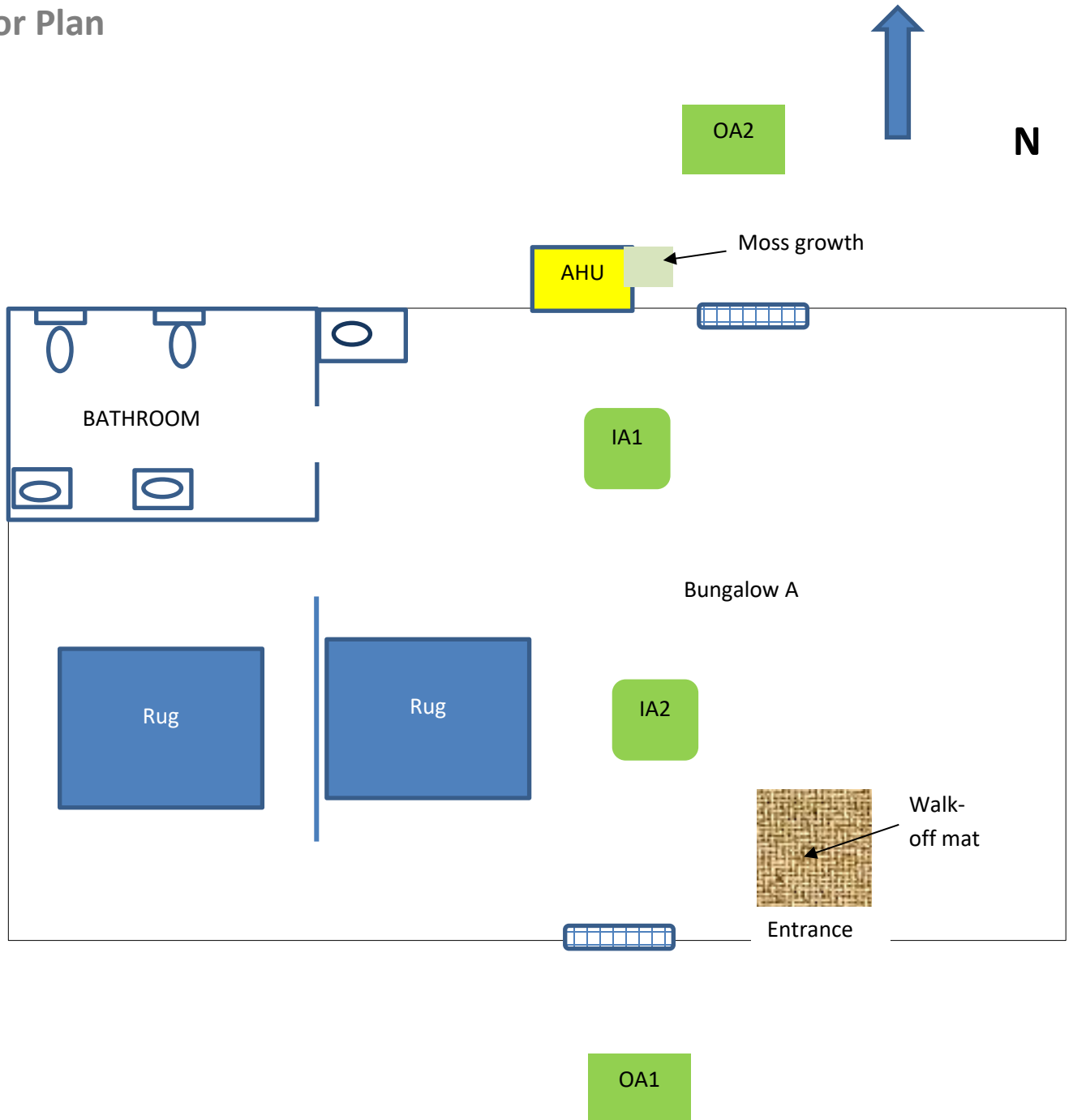
Table 1 Findings &amp; Recommendations

Ref #: Functional Area	IEQ/Mold & Moisture Findings Summary <sup>a</sup> History, Observations, Conclusion & Reasoning, Preliminary Cause	Photos & Samples <sup>a</sup>	Moisture <sup>b</sup> Elevated? (Substrate)	Mold <sup>d</sup> Conclusion, Obs. Area/Density, Projected Area	Repair Level <sup>e</sup> • Scope/Detail
Classroom Bungalow A (general air/surface)	<p><b>History:</b> A plumbing leak occurred in restroom several months ago. Reportedly, the source of the leak has been repaired. Staff have reported moldy/musty odor and adverse health effects and expressed concerns regarding mold growth.</p> <p><b>Observations:</b></p> <ul style="list-style-type: none"> <li>• A lemon/citrus cleaning solution odor was observed upon arrival. The odor was stronger in the restroom.</li> <li>• No visible mold growth was identified.</li> <li>• Moisture measurement readings indicated acceptable levels in all areas assessed.</li> <li>• A walk-off mat was observed at the entrance.</li> <li>• Heavy dust loading was observed on high horizontal surfaces and window tracks.</li> <li>• Heavy dust accumulation was observed on the return air grill.</li> <li>• Heavy spider web accumulation was observed under the sink.</li> <li>• Used sponges were stored in a Ziplock bag in a cabinet adjacent to the sink. FACS observed mold growth and a slight musty odor emitted from the bag.</li> <li>• Mild, dark-opacity dust deposition (ghosting) was observed at the HVAC supply air registers.</li> <li>• Debris and dust were observed on area rugs and vinyl flooring.</li> <li>• Heavy dust loading was observed on the exhaust fan in the restroom.</li> <li>• Historical water staining was observed under the handwashing sinks in the restroom.</li> <li>• No significant findings were observed in the refrigerator.</li> <li>• Moisture readings indicated acceptable levels at assessed building materials.</li> <li>• Reportedly, custodial staff perform daily trash-out. Other cleaning schedules (mopping, vacuuming, dusting) was not provided to FACS.</li> </ul> <p><b>Conclusion:</b> Mold growth is not suspected on building materials in the classroom. Elevated mold spore levels in the air and on surfaces is not suspected. This conclusion is based on the absence of musty/mildew odors, no visible mold growth, and air sample results which demonstrated significantly lower concentrations when compared to outdoor control samples on the day of sampling. Suspect mold growth was identified on used sponges stored in a Ziplock bag in a cabinet and should be disposed of appropriately. Refer to discussion on air/surface contamination in the attached FACS General Mold Assessment Guidance.</p> <p><b>Cause:</b> Plumbing leak.</p>	<p><u>Photos</u> 9-22 <u>Samples</u> F136748: IA1, IA2</p>	Not Elevated	<b>Not Suspected</b>	<ul style="list-style-type: none"> <li>• Discard used sponges (potential source of odors) stored inside the cabinet adjacent the sink. Ensure sponges are adequately dried prior to storage to prevent future microbial growth.</li> <li>• Consider using a “green” non-scented cleaning solution.</li> <li>• Consider a cleaning regimen using a HEPA-vacuum (of high efficiency filtered vacuum) for carpeting and other porous surfaces and damp-wiping of non-porous surfaces.</li> <li>• Consider damp-wipe cleaning of hard to reach spaces on a quarterly or semi-annual schedule. Avoid brushing off or “dusting” of surfaces (dry dusting). Dry dusting does not physically remove dust and particulates; this technique only aerosolizes (makes airborne) the dust. Eventually, the particles will re-settle on the surfaces.</li> <li>• Regularly maintain the exhaust fan in the restroom to ensure proper function and optimum performance.</li> </ul>

Ref #: Functional Area	IEQ/Mold & Moisture Findings Summary <sup>a</sup> History, Observations, Conclusion & Reasoning, Preliminary Cause	Photos & Samples <sup>a</sup>	Moisture <sup>b</sup> Elevated? (Substrate)	Mold <sup>d</sup> Conclusion, Obs. Area/Density, Projected Area	Repair Level <sup>e</sup> • Scope/Detail
AHU/Exterior	<p><b>History:</b> NA</p> <p><b>Observations:</b></p> <ul style="list-style-type: none"> <li>Condensate drain line was observed short and water impacted siding near the skirt was observed under the AHU.</li> <li>The MERV 8 pleated filter was observed with moderate loading. According to maintenance and operations personnel on site, the filters are changed based on staff availability.</li> <li>Moderate dust/debris deposition was observed on the interior components.</li> <li>Green moss growth was observed on the floor directly beneath the AHU.</li> <li>Rain gutters were observed rusted and damaged.</li> </ul> <p><b>Conclusion:</b> n/a.</p> <p><b>Cause:</b> n/a</p>	<p><u>Photos</u> 1-8</p> <p><u>Samples</u> F136748: OA1, OA2</p>	N/A	N/A	<ul style="list-style-type: none"> <li>Regularly inspect and maintain the AHU to ensure proper function including: <ul style="list-style-type: none"> <li>Inspect/replace filter regularly (No current PM program)</li> <li>Clean dust accumulation to prevent introduction of potential allergens and irritants into the occupied space;</li> <li>Clean and maintain interior components including cooling coils, condensate pan, drain lines to ensure cleanliness, proper function and drainage.</li> </ul> </li> <li>Extend the condensate drain line to prevent moisture impact of the siding.</li> <li>Inspect and maintain rain gutters so as water does not impact and damage siding during the next rains.</li> <li>Remove moss growth and figure out ways to reduce water from pooling to prevent future fungal growth.</li> </ul>
<p><b>Notes</b></p> <p><sup>a</sup> Cause of moisture/mold is preliminary based upon general observations and should be confirmed by an appropriately qualified building professional.</p> <p><sup>b</sup> Photo # refers to attached photo log. Sample # refers to attached lab report # and individual sample #. Positive results in bold.</p> <p><sup>c</sup> Moisture results elevated or not elevated based on observation or moisture meter readings. See attached methodology. Positive results in bold.</p> <p><sup>d</sup> Conclusion regarding presence of mold growth/contamination (<b>Suspected</b>, <b>Potential</b>, <b>Not Suspected</b>), total surface area of mold growth observed and growth intensity (light, moderate, heavy). Total area of observed &amp; projected hidden mold in parenthesis. "sf"=square feet, "lf"=linear feet.</p> <p><sup>e</sup> Refer to attached "FACS General Mold Remediation Guidelines" for general industry guidance regarding identified repair level.</p>					

## Appendix A

### Floor Plan



## Appendix B

### Photographs



Photo #1: Exterior – Overview of Classroom Bungalow A



Photo #2: Classroom Bungalow A – placard at entrance



Photo #3: Exterior – rain gutter warped and damaged



Photo #4: AHU – overview



Photo #5: AHU – condensate drain line observed short



Photo #6: Moisture impact evidence of siding (skirt) under the AHU condensate line



Photo #7: AHU – moss growth observed at the north elevation beneath the AHU



Photo #8: AHU – MERV 8 filter observed moderate loading



Photo #9: Classroom Bungalow A – overview



Photo #10: Classroom Bungalow A – overview



Photo #11: Debris on area rugs



Photo #12: Dust/debris on vinyl flooring



Photo #13: Sink – overview

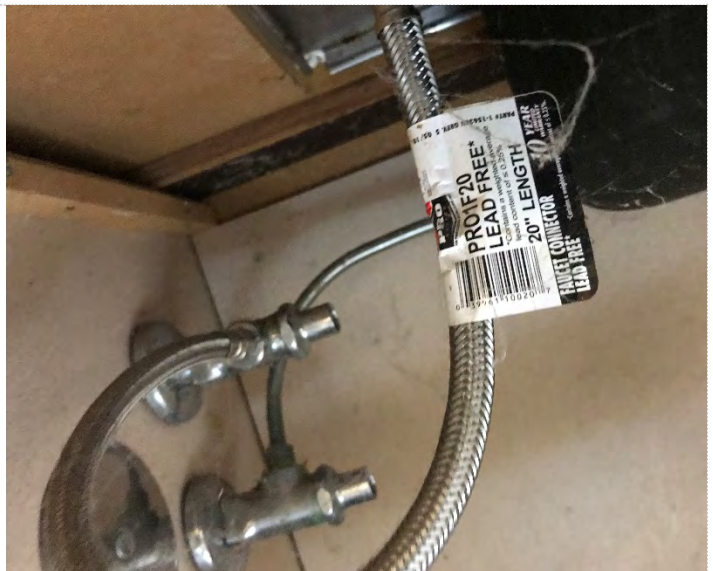


Photo #14: Heavy spider webs under the sink



Photo #15: Heavy dust deposition and spider webs under the sink



Photo #16: Used sponges stored in plastic bag; observed mold growth and musty odor upon removal from cabinet storage area



Photo #17: Heavy dust deposition on high horizontal surfaces



Photo #18: Heavy dust loading at the return air grill



Photo #19: Minor ghosting observed at the supply air register

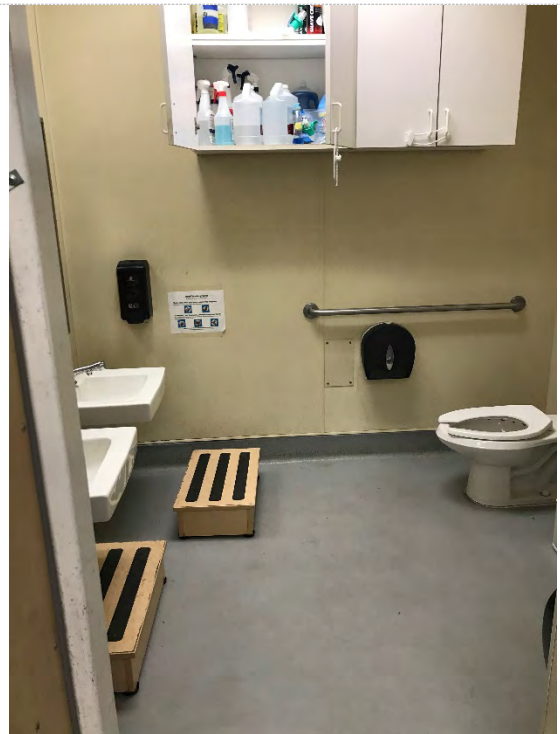


Photo #20: Restroom - overview

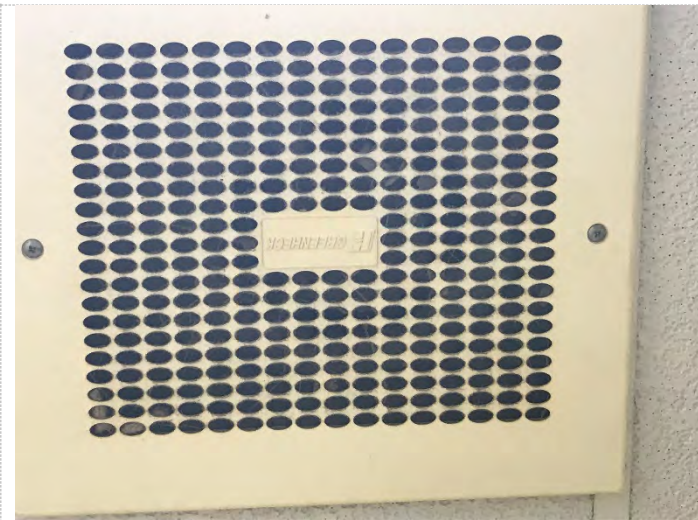


Photo #21: Heavy dust loading on exhaust fan in restroom



Photo #22: Overview of handwash sinks in restroom



Photo #21: Historical moisture stain on floor beneath sinks in the restroom



Photo #22: Moisture readings measured acceptable levels at building materials

## Appendix C

### Sampling Results Summary & Laboratory Reports

Sampling results are summarized in the table below. Supporting laboratory reports and chain of custody forms are attached in the pages that follow in order of laboratory report number.

Spore Trap Air Samples (Lab Report # F136748)			
Sample Number	Location	Summary of Comparison to Controls	
		Types	Concentrations
IA1	Classroom, north	Similar	Substantially Lower
IA2	Classroom, center	Similar	Substantially Lower
OA1	Exterior S elevation	Control Sample	Control Sample
OA2	Exterior N elevation	Control Sample	Control Sample
<b>Note:</b> Findings in bold considered elevated.			

Client #: LA05 FACS Los Angeles	FACS Project #: PJ44957	Sampled by: <u>mb</u>	Project Manager: Madeleine Dangazyan	Date: <u>11/8/20</u>
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Site Address: SMMUS- John Muir E/S Bungalow A - Moisture/Mold Assessment 2526 Sixth Street Santa Monica CA 90405	Analysis Requested: <input checked="" type="checkbox"/> NVA / <input type="checkbox"/> Other:	Turnaround Time: <input type="checkbox"/> Same Day <input type="checkbox"/> 1-Day <input type="checkbox"/> 2-Day <input checked="" type="checkbox"/> 3-Day <input type="checkbox"/> Other:
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Calibrator & Serial Number:	Lab Instructions/Notes: E-mail results to E-mail results to mdangazyan@forensicanalytical.com and dina.canchola@forensicanalytical.com
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Sample Number	Location (& Activity)	Start Flow Stop Flow	Start Time Stop Time	Total Time	Total Volume	Media # Exp. Date	Wind Weather	HVAC Windows
OA1	Exterior S elev.	15L 15L	0700 705	5mm	75L	32691675 11/2020	<input checked="" type="checkbox"/> L <input type="checkbox"/> M <input type="checkbox"/> H Dawn	<input type="checkbox"/> On <input type="checkbox"/> Off <input type="checkbox"/> Op <input type="checkbox"/> Cl
OA2	Exterior N elev.		722 727			32691670 11/2020	<input checked="" type="checkbox"/> L <input type="checkbox"/> M <input type="checkbox"/> H Dawn	<input type="checkbox"/> On <input type="checkbox"/> Off <input type="checkbox"/> Op <input type="checkbox"/> Cl
IA1	CR A North		707 712			32691669 11/2020	<input type="checkbox"/> L <input type="checkbox"/> M <input type="checkbox"/> H	<input type="checkbox"/> On <input checked="" type="checkbox"/> Off <input type="checkbox"/> Op <input checked="" type="checkbox"/> Cl
IA2	CR A Center		714 719			32691690 11/2020	<input type="checkbox"/> L <input type="checkbox"/> M <input type="checkbox"/> H	<input type="checkbox"/> On <input checked="" type="checkbox"/> Off <input type="checkbox"/> Op <input checked="" type="checkbox"/> Cl
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## Non-Viable Air Fungal Analysis

Forensic Analytical Consulting Svcs  
Madeleine Dangazyan  
2959 Pacific Commerce Drive

Rancho Dominguez, CA 90221

**Sample Type:** Allergenco-D

**Analysis:** Direct Microscopy; FALI Method IAQ 101; Modified ASTM D7391

**Job ID / Site:** PJ44957; SMMUS- John Muir E/S Bungalow A - Moisture/Mold Assessment 2526 Sixth Street santa monica CA 90405

**Client ID:** LA05  
**Report Number:** F136748  
**SGSFL Job ID:** LA05  
**Date Received:** 01/09/20  
**Date Analyzed:** 01/14/20  
**Date Printed:** 01/14/20  
**First Reported:** 01/14/20

**Total Samples Submitted: 4**

**Total Samples Analyzed: 4**

Lab Number	60214564				60214565				60214566			
Sample ID	OA1				OA2				IA1			
Location	Exterior S Elev.				Exterior N Elev.				CR A North			
Sample Date	01/08/20				01/08/20				01/08/20			
Volume	75.0 L				75.0 L				75.0 L			
Organism	Spores <sup>+</sup>	%	LOD	S/m <sup>3</sup>	Spores <sup>+</sup>	%	LOD	S/m <sup>3</sup>	Spores <sup>+</sup>	%	LOD	S/m <sup>3</sup>
Ascospores	1	0.7	31	31	ND	-	-	ND	ND	-	-	ND
Basidiospores	86	57.7	31	2,700	102	77.6	31	3,200	1	14.3	31	31
Cladosporium	57	38.3	31	1,800	29	22.1	31	900	6	85.7	31	190
Penicillium / Aspergillus	1	0.7	31	31	ND	-	-	ND	ND	-	-	ND
Rusts/smuts/myxomycetes	9	2.6	13	120	1	0.3	13	13	ND	-	-	ND
Total	154			4,600	132			4,100	7			220
Particulate Density	Major				Major				Major			
Particles	Number		LOD	P/m3	Number		LOD	P/m3	Number		LOD	P/m3
HYPHAL FRAGMENTS *	ND	-	-	ND	1	-	31	31	1	-	31	31
Comments												

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Page 2 of 3



## Non-Viable Air Fungal Analysis

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### Explanations:

Spores <sup>+</sup>	Actual number of spores counted in portion of sample examined
%	Percent of Total
LOD	Limit of Detection (Units are the same as result units)
S/m <sup>3</sup>	Spores per cubic meter of air sampled
Spores/S	Number of spores per sample
*	Not included in Totals Calculations
ND	None Detected
Particulate Density	Amount of background particulate present
-	Not Applicable
P	Particles excluding fungal spores
P/m <sup>3</sup>	Particles per cubic meter of air sampled
P/S	Number of particles per sample

### Background Particulate Density Estimated As Follows:

Trace	1 (<5% Occluded) Very little present
Minor	2 (>5% & <25% Occluded) Present but not in large quantity
Major	3 (>25% & <50% Occluded) Present in most of sample
Abundant	4 (>50% Occluded) Covering almost entire sample
Overloaded	5 Covering entire sample

### Guidelines For Interpretation:

No accepted quantitative regulatory standards currently exist by which to assess the health risks related to mold exposure. Molds have been associated with a variety of health effects and sensitivity varies from person to person.

Several organizations, including: the American Conference of Governmental Industrial Hygienists (ACGIH); the American Industrial Hygiene Association (AIHA); the Indoor Air Quality Association (IAQA); the United States Environmental Protection Agency (USEPA); the Centers for Disease Control (CDC), as well as the California Department of Health Services (CADHS), have all published guidelines for assessment and interpretation of mold resulting from water intrusion in buildings.

FALI reports solely the organisms observed on the sample(s). The limit of detection is based on observing one spore/colony per area analyzed. This is not an inclusive list of the fungal types identified in the microbiology laboratory.

**Vanessa Hurtado, Microbiology Laboratory Supervisor, Rancho Dominguez Laboratory**

Analytical results and reports are generated by Forensic Analytical at the request of and for the exclusive use of the person or entity (client) named on such report. Results, reports or copies of same will not be released by Forensic Analytical to any third party without prior written request from client. This report applies only to the sample(s) tested. Supporting laboratory documentation is available upon request. This report must not be reproduced except in full, unless approved by Forensic Analytical. The client is solely responsible for the use and interpretation of test results and reports requested from Forensic Analytical. Forensic Analytical is not able to assess the degree of hazard resulting from materials analyzed. Forensic Analytical reserves the right to dispose of all samples after a period of thirty (30) days, according to all state and federal guidelines, unless otherwise specified. Unless otherwise noted, these samples were not blank corrected. All samples were received in acceptable condition unless otherwise noted.

## Appendix D

### Data Collection Methods

*Moisture Meter Readings.* The moisture content of various building substrates was evaluated using a direct reading instrument. Forensic Analytical routinely uses a Delmhorst BD 2100 moisture meter or Tramex Moisture Encounter Plus. These instruments are capable of measuring the moisture content of wood, concrete/plaster and wallboard using preset factory scales. The factory pre-set ranges for the different substrates are as follows:

- 1) Wood range --- 8 % to 40 %
- 2) Plaster/Masonry --- 0 to 100 (reference scale – not percentage)
- 3) Gypsum board --- 0.2 % to 50 %

*Non-Viable Air Sampling.* Air samples are collected using an Allergenco D spore trap sampling cassette and portable high-volume sampling pump. The sampling train is calibrated in the field to approximately 15 liters per minute with a target collection sample volume between 75 liters and 150 liters depending on the anticipated concentration of fungal spores or particulate matter in the air. The air samples are labeled with unique samples numbers and information recorded on field chain of custody forms. The samples are promptly delivered to the laboratory for analysis.

Samples were promptly delivered to SGS Forensic Laboratories, Inc. for analysis. The laboratory is accredited by the American Industrial Hygiene Association (AIHA) Laboratory Accreditation Programs LLC in its Environmental Microbiology Laboratory Accreditation Program (EMLAP).

## Appendix E

### FACS General Mold Assessment Guidelines

#### Mold Growth Overview

Mold (a.k.a., “fungal”) growth can occur when organic building materials or accumulated organic debris is impacted by moisture. This may occur within 24-48 hours from the time such materials become wet, hence it is critical that materials are substantially dried within this time frame in order to minimize the potential for mold growth to develop. Mold growth has the potential to elicit negative health effects in sensitive persons. This most frequently manifests as allergic respiratory symptoms which may range from mild to severe depending on individual sensitivities. Irritant and infectious effects are possible. It is generally accepted that mold growth in buildings should be removed following appropriate precautions to protect workers involved in the clean-up and the surrounding environment. Greater precautions are taken for greater amounts of mold growth. In addition, the underlying cause of mold and moisture intrusion should be identified and corrected in order to minimize the potential for recurrent mold growth. Additional information can be found at the U.S. Environmental Protection Agency website (<http://www.epa.gov/mold/>).

#### Occupant Exposure

In general, when considering the risk of occupant exposure to indoor mold growth, the following should be recognized:

- No accepted quantitative standards currently exist by which to assess the health risks related to fungal exposure. Since fungus and airborne fungal spores are common in the natural environment, most guidelines focus on the amount and location of visible fungal growth present and comparison of indoor and outdoor spore levels.
- Airborne fungal spore levels can vary greatly over time due to changes in environmental conditions and activity patterns. In addition, limitations inherent in commonly used fungal spore air sampling methods may mask differences between case and control samples. Based on these factors, air samples may only detect large differences between case and control environments.
- Based on these limitations, and on the potential presence of other adverse biological agents that may develop on moisture impacted materials, mold growth and dampness in buildings should be controlled and impacted areas should be appropriately addressed in order to promote a healthful indoor environment.

#### Causal Conditions

Conditions resulting in moisture impact upon organic building materials should be determined and corrected in order to prevent the development of mold growth. These findings should be reviewed and verified by an appropriately qualified construction professional in order to ensure accurate identification and correction of the causes of moisture intrusion issues.

## Appendix F

### FACS General Mold Remediation Guidelines

## CONTENTS

- Global Mold Remediation Guidelines
- General Procedures for:
  - M0 De Minimus Mold Remediation
  - M1 Small Scale Mold Remediation
  - M2 Medium Scale Mold Remediation
  - M3 Large Scale Mold Remediation
  - MC Removal of Mold Spore Contamination
  - ME Exterior Mold Remediation
  - MT Invasive Inspection for Mold

## GLOBAL MOLD REMEDIATION GUIDELINES

1. *General Practices.* All work, which may result in the disturbance of mold growth or contamination, should be performed using work practices that minimize the disturbance of affected materials and dispersion of mold spores. Measures should also be taken to protect the health and safety of individuals performing remediation activities. At a minimum, work should be performed in accordance with the following guidelines addressing mold/water intrusion remediation:
  - Environmental Protection Agency. (September 2008). *Mold Remediation in Schools and Commercial Buildings*. EPA 402-K-01-001.
  - New York City Department of Health. (November 2008). *Guidelines on Assessment and Remediation of Fungi in Indoor Environments*.
  - U.S. Department of Labor Occupational Safety and Health Administration (November 8, 2013). *Safety and Health Information Bulletin: A Brief Guide to Mold in the Workplace*. SHIB 03-10-10.
  - American Industrial Hygiene Association. (2008). *Recognition, Evaluation and Control of Indoor Mold*. IMOM08-679.
  - Institute of Inspection, Cleaning and Restoration Contractors. (2015). *IICRC 500 Standard and Reference Guide for Professional Water Damage Restoration*. Fourth edition.
  - Institute of Inspection, Cleaning and Restoration Contractors. (2015). *IICRC S520 Standard and Reference Guide for Professional Mold Remediation*. Third edition.
2. *Material Removal.* In the course of removing building materials, bulk quantities of visible mold growth shall be removed from all wood structural members or other materials. Materials should be cleaned or removed 18 inches past visible mold growth unless otherwise specified.
3. *Regulated Materials.* Prior to commencing remediation activities, building materials that may be disturbed should be assessed for asbestos and lead-based paint hazards per applicable regulations.
4. *Sources of Moisture.* Mold growth is most frequently caused by a failure to adequately control moisture. Thus, whenever mold remediation is performed, measures should be taken to correct the conditions resulting in excess moisture and mold growth.

## GENERAL PROCEDURES

### **M0: General Procedures for De Minimus Mold Remediation**

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*The following procedures are provided for general guidance and may be modified as appropriate to address specific conditions on a case-by-case basis. All work should be performed in accordance the aforementioned guideline publications.*

- **Example Applications**
  - Surface cleaning and non-aggressive removal of  $\leq 1$  ft.<sup>2</sup> of mold growth.
  - Surface cleaning of areas with light or minimal mold spore deposition/contamination.
  - Typical housekeeping activities.
- **Personal Protective Equipment**
  - May include the use of an N-95 disposable respirator, gloves and eye protection.
- **Containment Provisions**
  - None required.
- **Work Practices**
  - Mist surface and wet-wipe in a manner that minimizes disturbance of growth.
- **Post-Remediation Assessment**
  - Visual confirmation of removal of growth.

### **M1: General Procedures for Small Scale Mold Remediation**

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*The following procedures are provided for general guidance and may be modified as appropriate to address specific conditions on a case-by-case basis. All work should be performed in accordance the aforementioned guideline publications.*

- **Example Applications**
  - Surface cleaning and non-aggressive removal of  $>1$  to  $<10$  ft.<sup>2</sup> of mold growth.
  - Aggressive removal of materials with  $\leq 1$  ft.<sup>2</sup> of dense mold growth, or  $<10$  ft.<sup>2</sup> of sparse mold growth.
  - General construction dust control for removal of building materials.
- **Personal Protective Equipment**
  - N-95 disposable respirator, gloves and eye protection.
- **Containment Provisions**
  - Cover the immediate work area with plastic sheeting.
  - A floor to ceiling plastic barrier should be erected to further isolate the work area if greater than approximately 5 ft. of material is being aggressively removed (e.g., removal of drywall).
  - Ensure ventilation provisions in the area are turned off.
- **Work Practices**
  - Remediation performed by maintenance/construction personnel with awareness training regarding proper clean up methods, personal protection, and potential health hazards associated with mold.
  - Clean surfaces using a HEPA vacuum or dust suppression methods (e.g., misting).
  - Remove materials using methods to minimize the disturbance of growth and for general dust suppression (e.g., HEPA vacuum positioned at the point of operation/removal and misting).
  - If removal cannot be accomplished without significant disturbance of mold growth or more extensive mold growth is encountered, then work should stop and medium or large scale remediation procedures should be implemented.
  - All contaminated materials should be removed from the work area in a sealed plastic bag.
  - Following removal of mold growth, clean the work area and immediately adjacent surfaces using a HEPA vacuum or wet-wiping.

- **Post-Remediation Assessment**

- Assessment by a designated individual familiar with these procedures and with mold awareness training.
- Visual confirmation of removal of growth and absence of contamination and debris prior to removal of containment provisions.
- Materials should be dried and causes of moisture impact controlled to prevent future growth.

## **M2: General Procedures for Medium Scale Mold Remediation**

---

*The following procedures are provided for general guidance and may be modified as appropriate to address specific conditions on a case-by-case basis. All work should be performed in accordance the aforementioned guideline publications.*

- **Example Applications**

- Surface cleaning and non-aggressive removal of 10 to <100 ft.<sup>2</sup> of mold growth.
- Aggressive removal of materials with >1 to <10 ft.<sup>2</sup> of dense mold growth, or 10 to <100 ft.<sup>2</sup> of sparse mold growth.

- **Personal Protective Equipment**

- ½-face respirator with HEPA filters, gloves, disposable coveralls and goggles. Consider the use of HEPA/organic vapor combination cartridges if strong musty odors are present.

- **Containment Provisions**

- Isolate the work area from the surrounding environment using 1 layer of plastic sheeting configured with a slit entry and covering flap.
- Seal all penetrations to surrounding areas using plastic and tape (e.g., outlets, light switches, ventilation grills).
- Negatively pressurize the work area and exhaust out of the work area with HEPA filtration.

- **Work Practices**

- Remediation performed by professional mold remediation contractors with appropriate training and experience in mold remediation practices.
- Clean surfaces using a HEPA vacuum or dust suppression methods (e.g., misting).
- Remove materials using methods to minimize the disturbance of growth to the extent feasible.
- All contaminated materials should be removed from the work area in a sealed plastic bag.
- Following removal of mold growth, clean the work area, immediately surrounding area, and worker egress pathways using a HEPA vacuum or wet-wiping.

- **Post-Remediation Assessment**

- Assessment performed by a professional mold consultant with appropriate training and experience.
- Visual confirmation of removal of growth and absence of contamination and debris.
- Collection and evaluation of air and surface samples as appropriate to support visual inspection.
- Materials should be dried and causes of moisture impact controlled to prevent future growth.
- Containment provisions remain in place until the work areas has passed the assessment criteria.

## **M3: General Procedures for Large Scale Mold Remediation**

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*The following procedures are provided for general guidance and may be modified as appropriate to address specific conditions on a case-by-case basis. All work should be performed in accordance the aforementioned guideline publications.*

- **Example Applications**

- Surface cleaning and non-aggressive removal of ≥100 ft.<sup>2</sup> of mold growth.

- Aggressive removal of materials with  $\geq 100 \text{ ft.}^2$  of dense or sparse mold growth.
- **Personal Protective Equipment**
  - Full-face respirator with HEPA filters, gloves, disposable coveralls with head and foot coverings and goggles. Consider the use of HEPA/organic vapor combination cartridges if strong musty odors are present.
- **Containment Provisions**
  - Isolate the work area from the surrounding environment using 2 layers of plastic sheeting configured with a decontamination area between two slit entries with covering flaps.
  - Seal all penetrations to surrounding areas using plastic and tape (e.g., outlets, light switches, ventilation grills).
  - Negatively pressurize the work area and exhaust to the outdoor environment with HEPA filtration.
- **Work Practices**
  - Remediation performed by professional mold remediation contractors with appropriate training and experience in mold remediation practices.
  - Clean surfaces using a HEPA vacuum or dust suppression methods (e.g., misting).
  - Remove materials using methods to minimize the disturbance of growth to the extent feasible.
  - All contaminated materials should be removed from the work area in a sealed plastic bag.
  - Following removal of mold growth, clean the work area, immediately surrounding area, and worker egress pathways using a HEPA vacuum or wet-wiping.
  - Mist surface and wet-wipe in a manner that minimizes disturbance of growth.
- **Post-Remediation Assessment**
  - Assessment performed by a professional mold consultant with appropriate training and experience.
  - Visual confirmation of removal of growth and absence of contamination and debris.
  - Collection and evaluation of air and surface samples as appropriate to support visual inspection.
  - Materials should be dried and causes of moisture impact controlled to prevent future growth.
  - Containment provisions remain in place until the work areas has passed the assessment criteria.

### **MC: General Procedures for Removal of Mold Spore Contamination/Deposition**

*The following procedures are provided for general guidance and may be modified as appropriate to address specific conditions on a case-by-case basis. All work should be performed in accordance the aforementioned guideline publications.*

- **Example Applications**
  - Removal of secondary mold spore deposition from surfaces and contents resulting from the presence of mold growth reservoirs in the shared environment.
  - Note: Areas of light or minimal contamination may be cleaned in accordance with procedure M0.
- **Personal Protective Equipment**
  - Minimum of N-95 disposable respirator, gloves and eye protection. More extensive protective equipment may be appropriate depending on the severity of contamination.
- **Containment Provisions**
  - Not generally required, however conditions of severe contamination may necessitate containment provisions depending on conditions in surrounding environments.
- **Work Practices**
  - Remediation performed by professional mold remediation contractors with appropriate training and experience in mold remediation practices.
  - Clean horizontal and vertical surfaces in place.

- Wet-wipe hard, non-porous surfaces.
- HEPA vacuum soft, porous surfaces. Disposal of porous materials exhibiting growth may be necessary.
- Launder or dry-clean textiles.
- Consider use of HEPA filtered negative air machines to purge or scrub the air in the area.
- **Post-Remediation Assessment**
  - Assessment performed by a professional mold consultant with appropriate training and experience.
  - Visual confirmation of removal of growth and absence of contamination and debris.
  - Collection and evaluation of air and surface samples as appropriate to support visual inspection.

## **ME: General Procedures for Exterior Mold Remediation**

*The following procedures are provided for general guidance and may be modified as appropriate to address specific conditions on a case-by-case basis. All work should be performed in accordance the aforementioned guideline publications.*

- **Example Applications**
  - Cleaning of  $\geq 10$  ft.<sup>2</sup> of mold growth from exterior surfaces.
  - General construction dust control for the exterior removal of building materials.
  - Note: Cleaning of  $< 10$  ft.<sup>2</sup> of exterior mold growth may be conducted in accordance with procedure M0.
- **Personal Protective Equipment**
  - Minimum of N-95 disposable respirator, gloves and eye protection. More extensive protective equipment may be appropriate depending on the severity of growth or intensity of removal activities.
- **Containment Provisions**
  - Prior to commencing work, close all windows and doors in or adjacent to the work area and seal interior window and door penetrations with tape (easy release or painters tape).
  - If removal of exterior building materials is to occur, seal all wall penetrations (i.e., electrical outlets and light switches) and base of wall on the associated interior wall being repaired with tape (easy release or painters tape).
- **Work Practices**
  - Remediation performed by maintenance/construction personnel with awareness training regarding proper clean up methods, personal protection, and potential health hazards associated with mold. The use of a professional mold remediation contractor may be appropriate depending on the severity of mold growth.
  - Proceed with exterior cleaning or building material removal using dust control methods (e.g., misting).
  - Inspect the back of exposed interior wall systems for evidence of mold growth. If mold growth is observed, proceed with cleaning or removal in accordance with procedures M0-M3 as appropriate.
  - Use a HEPA vacuum to remove excess debris from the wall cavity prior to reconstruction.
- **Post-Remediation Assessment**
  - Assessment by a designated individual familiar with these procedures and with mold awareness training.
  - Visual confirmation of removal of growth and absence of contamination and debris prior to removal of containment provisions.
  - Materials should be dried and causes of moisture impact controlled to prevent future growth.

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**MT: General Procedures for Invasive Inspection for Mold**

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*The following procedures are provided for general guidance and may be modified as appropriate to address specific conditions on a case-by-case basis. All work should be performed in accordance the aforementioned guideline publications.*

- **Example Applications**
  - Removal of building materials in areas where there is the potential for mold growth (i.e., the presence of mold growth has not been confirmed).
- **Personal Protective Equipment**
  - May include the use of an N-95 disposable respirator, gloves and eye protection as appropriate for general construction activities.
- **Containment Provisions**
  - Follow practices for general construction dust control (see M1 above). No special provisions for controlling mold growth are required.
- **Work Practices**
  - Remove a small area of building material from the area in question to facilitate visual inspection (e.g., <1ft.<sup>2</sup>).
  - In the course of removal, proceed in a manner that minimizes disturbance of potential concealed mold growth reservoirs. For example, cut around and gently remove a section of drywall as a single piece rather than demolishing the area with a hammer. A HEPA vacuum nozzle placed at the point of removal may further control potential releases.
  - Continue removal of materials in a stepwise fashion in order to perform desired construction repairs or to determine if any hidden mold growth exists.
  - If mold growth is encountered in the course of removal, immediately stop and proceed in accordance with mold remediation procedures as appropriate (see M0-M3 above).
- **Post-Remediation Assessment**
  - No assessment is necessary if no mold growth is encountered. If mold growth is encountered, follow the appropriate post-remediation assessment guidelines as discussed in M0-M3 above.

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