

Microbial Screening
Investigation Report

Project Location:

[Name] Medical Clinic
[Address]
[City, State]

Prepared For:

[Client Name, Address]

Prepared By:

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Date:

Project Number:

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MICROBIAL SCREENING INVESTIGATION

[Site Name]

INTRODUCTION

Parks Environmental Consulting, Inc. (Parks) was retained by [Client] to provide indoor air testing, inspection and investigation for fungal related issues and employee health complaints at the [Site name], [address] (the Site).

The scope of Parks' investigation was to conduct an initial screening assessment for potential fungal related issues in a formerly wet carpet area, and investigate employee related health concerns and issues possibly related to the wet carpet incident. The assessment included a visual site inspection, limited testing for fungal spores and interviews with site employees. Mr. Tim Marxhausen of Parks conducted the investigation on [date].

BACKGROUND INFORMATION

The site consists of a single story building used as a pediatric medical clinic. The building is approximately 8,000 square feet in size, built 15-20 years ago. According to the site manger, a clogged floor drain in the furnace room caused water to collect on the floor and migrate under a room wall into the adjacent room carpeting. The drain overflow and water migration to the adjacent room carpet occurred approximately 4-6 weeks prior to Parks' site visit. The total floor area wetted and affected with water was approximately 4-6 square feet in the furnace room and 10-15 in the adjacent office.

About the time of the wet floor incident, 3-4 individuals who work in the clinic reported adverse health effects consisting of increased allergy and symptoms, headaches, and increased sinus congestion. Some occupants also reported a "musty" smell in the office where the carpet had become wet.

Site occupants also reported that the [City] area experienced above normal precipitation in late winter through spring (February – May). The crawlspace underneath the building was reportedly wet and damp during this period.

SITE OBSERVATIONS

The facility is a one-story wood frame construction with exterior wood finish. The foundation is concrete block. The main floor is elevated approximately three feet above the ground and supported by steel beams. There is a crawlspace under the main floor. The crawlspace consists of aggregate rock spread over the ground.

Interior walls are painted gypsum board. The floor finish materials are predominantly carpet over concrete with some areas of vinyl flooring. The heating, ventilation, and air conditioning (HVAC) system is a central forced air system.

On the day of Parks' site visit, the affected areas were inspected for visual evidence of fungal staining, fungal growth and potential moisture intrusion. The furnace room floor and the adjacent office carpet were dry to the touch.

Photographs were taken during the investigation depicting various observations are presented in Appendix B.

MOISTURE TESTING

Moisture testing was conducted on various affected surfaces inside the building. A Tramex Moisture Meter (Moisture Encounter model) was used to evaluate moisture levels in walls and floors. In general moisture levels less than .5 to .7 % in drywall as measured by the Tramex instrument are considered acceptable. Walls in the furnace room, the affected office, and other nearby office/room walls were tested, with all readings less than 0.7 %. Moisture levels were not detected on floor surfaces (carpet or concrete).

OCCUPANT INTERVIEWS

Four persons who work daily in the building were interviewed the day of Parks' site visit. Summaries of these interviews are provided below.

[Occupant 1]

[Occupant 1] is a nurse who has worked in the building for about one year; she is "highly allergic to mold" and suffers from asthma. [Occupant 1] reportedly started experiencing increased allergy and asthma symptoms in early January of this year while at work in the building. On June 4th, she was hospitalized for three days due to a severe asthma episode. She has experienced more frequent headaches in the afternoons over the past few months; these headaches subside within a couple hours after leaving work.

[Occupant 2]

[Occupant 2] is a nurse who has worked in the building for approximately 12 years. She has a history of allergy problems, but claims this year has "been the worst". She experienced sinus congestion and runny nose in late March and April of this year. Her symptoms subsided in the month of June.

[Occupant 3]

[Occupant 3's] office is where the carpet became wet due to the clogged floor drain in the adjacent furnace room. He stated there was a "musty, moldy" odor in his office at the time the carpet got wet. He is allergic to molds and has been taking medication due to increased allergy symptoms.

[Occupant 4]

[Occupant 4] is a nurse who has worked in the building for eight years. She stated she is allergic to mold. She reports that at the end of January, she came into work and noticed that the building smelled "really bad". She heard that the crawlspace was wet and attributed the odor to that situation. She experienced increased allergy symptoms (headaches, sinus congestion) from mid-May through June. Her symptoms subside after she has not been in the building for a couple days.

NON-VIABLE FUNGAL SPORES SAMPLING METHODOLOGY

Air samples for non-viable fungal spores were collected on Zefon Air-O-Cell spore trap cassettes. Non-viable samples are collected on a non-culturable medium that consists of a thin layer of adhesive substrate applied to a glass slide or cover slip. This adhesive substrate on the air cassette or tape lift is used to trap airborne and surface particulate(s) which impact the surface.

Advantages of collecting non-viable samples are that the glass slides can be removed for immediate direct microscopic analysis and include all spore types present in the examined area, including those that would not grow on nutrient media. The disadvantage is that there is a limit to the identification of the fungal species. *Aspergillus* and *Penicillium* spores have similar morphologies and cannot be differentiated by non-viable analytical methods, therefore, they are reported together.

Non-viable air sampling was conducted using a vacuum pump and Zefon Air-O-Cell cassette. The sampling train was set at a flow rate of 15 liters per minute (L/min) with a sample volume target of approximately 150 liters. The HVAC system was operating as usual; on the day of our site visit, the building air was being air conditioned due to outside temperatures around 80°F. Staff and clinic patients came and went through front doors as usual during the sampling periods.

FUNGAL SPORE SAMPLING RESULTS

Exposure limits for airborne fungal spores have not been promulgated and dose-response data are not available for fungal spore exposures. Therefore, fungal spore levels must be compared to outdoor levels, or to an asymptomatic control area, to determine the relative exposures. In general, indoor fungal spore levels (in the absence of an indoor amplification source) are typically equal or lower than outdoor levels, with a similar biodiversity.

Parks collected four non-viable air spore trap samples at the Site on [date]. Samples were collected from: 1) the office that had previous wet carpet; 2) an unaffected office nearby (business office); 3) outdoors; and, 4) above the carpet in the affected office while brushing the carpet. The samples were submitted to [laboratory] for analysis by light microscopy. The attached Laboratory Report No. F006904 presents the results of the non-viable air testing (Appendix A).

The results of the ambient indoor air samples indicate spore levels less than outdoor levels. The sample collected above the carpet in the wet carpet office, during brushing of the carpet, indicated higher spore levels; but not excessive. We attribute the higher spore levels seen in this sample to the agitation that was done to determine if fungal spores or parts were imbedded in the carpet.

CONCLUSIONS

Parks conducted microbial screening and occupant interviews for potential fungal related issues at the Site. The affected areas were visually inspected for fungal

growth and moisture intrusion. A limited number of airborne fungal spore traps were collected from the interior of the residence and compared to outdoor control samples. No visible mold was observed at the time of our site visit.

No wet floors, walls, carpet or other building components were noted. The affected area appeared to be dry; moisture meter readings did not indicated above average subsurface moisture content in walls or floors.

The crawlspace area was observed to be dry.

Fungal growth can result from an underlying moisture problem. Water intrusion, chronic moisture problems and/or a relative humidity in excess of 60 percent can provide an environment suitable for fungal growth. The wet carpet episode may have contributed to mold growth within the carpet. Air sample #3 indicated higher mold spore and mold constituent (hyphal fragments) levels than the other ambient air samples. Based on this data and occupant reports of a musty odor in this office, it is likely that some types of mold propagated (but not in amounts to be visible to the naked eye) in, or under, the carpet in this room.

Conversations with the site manager indicate that the clogged drain has been fixed and future incidents of water on the floor in the furnace room are unlikely.

It is advisable to remove the water-damaged carpet in the affected office. If done, this work should be performed using environmental containment techniques and engineering controls. We would recommend the use of employees and/or contractors experienced in fungal remediation techniques and performance guidelines.

LIMITATIONS

Conclusions stated here refer only to the specific site investigation at the time of the investigation. The sampling data above is indicative of conditions that existed at the time of Parks' sampling. It should be noted that these conditions could change as a result of any number of factors. Should further research on the site be conducted, the additional data should be reviewed by Parks' and the conclusions presented herein may be modified. This report is prepared for the sole use of our client.

Parks Environmental Consulting, Inc.

Tim Marxhausen
Industrial Hygienist
Sr. Project Manager

Date

APPENDIX B

Photographs



Photograph 1
Front View of Subject Site.



Photograph 2
Furnace Room where Drain Clogged and Water Collected on Floor



Photograph 3
Office Area where Carpet got Wet



Photograph 4
Building Crawlspace