

GUIDANCE DOCUMENT

1. This guidance document has been developed to assist owners of premises who are required to provide an environmental assessment and remediation plan on a premise reported as a Marijuana Grow House and those who are seeking to have a “**prohibit occupancy**” order removed. This guidance document outlines mould (environmental investigation and fungal air testing), remediation plan, and sampling or remediation work is required then specified by this document, then the consultant should see that this performed and reported.
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2. Objectives of the Environmental Assessment:

- a) To determine the extent of fungal contamination and identify the contributory source(s).
 - b) To identify indoor pesticide contamination and sources of exposure.
 - c) To determine and evaluate the extent of water damage and indoor moisture problems.
 - d) To develop a remediation strategy to mitigate the identified problems. (Remediation Plan).
 - e) To re-evaluate the environmental conditions post-remediation to ensure the premises is suitable for occupancy (Verification Report).
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3. Professional Assistance

3.1 Environmental Consultant

The owner will ensure that the assessment is undertaken by a person who is qualified in the assessment is undertaken by a person who is qualified in the assessment of mould and other indoor air quality problems, herein referred to as the Consultant. The consultant will undertake an initial assessment; assessment after the remediation work has been done. The consultant will produce the reports as outline in Section 4.0 (Reporting Requirements).

3.2 Laboratory Services

Any microbial analysis that is undertaken as part of the assessment or verification of the remediation will be conducted by a Laboratory that can demonstrate AIHA (American Industrial Hygiene Association) certification as an Environmental Microbiology Accredited Laboratory with a competence in moulds or demonstrated routine participation and acceptable performance in an Environmental Microbiology Proficiency Analytical Testing (EMPAT) program for both culturable and direct examination determination of fungi, or other comparable accreditation.

A statement of qualification of the laboratory must be attached to analytical reports and included in reports submitted to Toronto Public Health.

4.0 Reporting Requirements

The Consultant is required to provide Toronto Public Health with the following reports and documentation:

- a) A written report, including original colour photographs upon request, of the findings of the investigation. The report should address the following items as minimum:
- Description of the findings related to water damage including an identification of the room or space being described.
 - Description of the findings on visible mould Including an identification of the room or space being described, and the size of the mould-contaminated area . Condition of the HVAC system
 - Colour photographs of visible mould, and
 - For any of the requirements listed in sections 5.1 and 5.2 that are not carried out, an explanation of why it was omitted.
- b) Documented results of on-site measurements (e.g. relative humidity levels)
- c) All laboratory test results as provided by the analytical laboratory and documentation on the following items:
- Date, time and location of sample collection for each sample result
 - Number of outdoor samples collected including date(s), time, and location.
 - Comments on damage or signs of mould contamination during air sampling
 - Comments on the assessment of the building regarding evidence of water damage or intrusion
 - Description of the weather conditions on the day(s) of testing, including outdoor temperature,
 - Species identification results for both indoor and outdoor samples, and a numeric value for each species identified.
 - An interpretation of the air monitoring results and their significance.
- d) A written report of the recommended remediation plan. The report should address the following items as a minimum:
- Description of the general layout of the premises (number of floors, rooms etc.)
 - Description of the extent of visible mould contamination with reference to the four levels of abatement as stated In section 6.0
 - Statement on the clean-up strategy for mould contamination and water damage
 - Statement on required maintenance work to rectify water damage and on the HVAC system

e) A written verification report of the remediation assessment results after remediation work has been completed including information on the following items:

- Status of the mould clean-up work and maintenance work as identified in the Remediation Plan
- If any of the required clean-up or maintenance work are not completed, a statement of the reasons
- Post-Remediation fungal air sampling results with an interpretation of the significance of the results
- A statement on whether the premise is deemed habitable

f) Any additional reports or documentation that maybe requested by Toronto Public Health.

Forward the above report(s) and assessment(s) to the appropriate Regional Office of Toronto Public Health, Healthy Environments.

5.0 Conducting an Environmental Investigation

The activities listed in sections 5.1 and 5.2 are expected as a minimum In conducting environmental investigations and fungal air testing respectively. The Consultant will ensure the completeness of the documentation to the satisfaction of the Medical Officer of Health.

5.1 Environmental Investigation

The environmental investigation shall include as a minimum:

- Visual inspection of the basement, crawl space(s), all floors, attics, furnace ventilation and heating ducts for mould and water damage. This shall include intrusive and destructive investigation of hidden cavities and surfaces to the extent considered necessary in the opinion of the expert consultant. Intrusive and destructive testing may include but is not limited to, cutting access holes in walls and ceilings, lifting carpets or vinyl sheet flooring and removing wallpaper for investigation purposes.
- Assessment of the structure by use of moisture meters and/or borescopes.
- Where visual inspection identifies the presence of chemicals (ie: fertilizers or pesticides) associated with the marijuana grow operation the consultant Is to assess the level of contamination with these chemicals and provide confirmation of remediation of impacted areas.
- An inventory of obvious and potential areas that may contribute to mould contamination such as HVAC system malfunctions, signs of water damage, etc.

5.2 Fungal Air Testing

Air samples for fungal enumeration and speciation purposes should be carried out by the consultant contracted by the owner. Air sampling is required in addition to the environmental investigation outlined in section 5.1 and should be carried out after the remediation work has been completed. The consultant may choose to conduct air sampling prior to remediation as part of their investigation.

Fungal air sampling requirements listed below are based on Health Canada's publication, Fungal Contamination in Public Buildings: Health Effects and Investigation Method (2004, pages 40-41) 1, and requires the following:

- Ventilation system is operational
- Collection of representative air samples from each floor of the premises including the area where the marijuana grow operation was located. This may include attic space(s), basement and crawl space(s) but only if these areas are observed to be contaminated with visible mould
- Allow one or two hours between duplicate air sampling in a given space. Sampling is not to occur during precipitation. Toronto Public Health recommends a 24 hour buffer period between the end of a precipitation event and air sampling.
- Collect at least one outdoor air sample during the period when the indoor samples are collected.
- Collect a representative outdoor sample for each day of sampling. Toronto Public Health recommends collecting outdoor samples from the area from which air is drawn to ventilate the indoor space.
- The outdoor control sample should be collected at the discretion of the consultant but sampling on the windward side of the structure is recommended.
- The air samples should provide information on culturable or viable propagules in air, including species identification.

5.3 Interpretation of Fungal Air Sampling Results

The consultant is required to interpret the air sampling results based on Health Canada's guidelines as provided in section 5.2.8.4 of the publication Indoor Air Quality in Office Buildings: A Technical Guide (2004)² which is included as Appendix 1, Listing 1, of this document. Interpretation of results should be based on the criteria that 'normal' air mycoflora is qualitatively similar and quantitatively lower than that of outdoor air. In other words, the distribution of indoor moulds at the genus or species level is similar to the outdoor distribution and quantitatively lower than outdoors. The consultant can summarize findings from the analytical laboratory but must include the analytical report from the laboratory showing the mould genus/species breakdown for each sample. In addition to providing the raw data, it is recommended that the indoor and outdoor sample results also be presented in a 'rank order comparison' format for each replicate indoor sampling location and event, as represented in table 1 in Appendix 1.

5.3 1 Seasonal Variation

If there was snow cover on the ground at the time when air samples were collected and if the indoor air mycoflora is not qualitatively similar and quantitatively lower than that of outdoor air, the Consultant may use his/her professional judgement in describing whether the result of the indoor fungal levels are typical for dwellings in Toronto for the season. However, regardless of outside weather conditions, the environmental conditions inside the dwelling must meet the following criteria:

- a) indoor fungal levels must be at or below the maximum acceptable levels (CFU/m³ or presence /absence) listed in Appendix 1, Listing 1, and
- b) The source of the indoor fungal contamination (both airborne and visible) must not be from an existing condition of the dwelling.

The results of the environmental assessment will be based on the findings from the environmental investigation (5.5.1) and fungal air testing (s.5.2) results.

6.0 Remediation Plan

Mitigation strategies for areas identified in the environmental investigation (section 5) as either contributing to the environmental contamination or as potential sources shall be clearly documented. The appropriate remedial actions for mould contamination will be determined based on the size of the mould-contaminated area. There are four levels of abatement for private residences as follows (refer to appendix 2 for detail):

- Level 1: Small Isolated Areas (10 sq.ft. or less)
 - Level 2: Mid-Sized Isolated Areas (10- 30 sq.ft.)
 - Level 3: Large Isolated Areas (30 —100 sq. ft.)
 - Level 4: Extensive Contamination (greater than 100 contiguous sq.ft.)
 - Level 5: Remediation of HVAC Systems
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7.0 Remediation of Mould

Toronto Public Health requires that the presence of mould be corrected in accordance to the requirements in Appendix 2 of this document. In addition, sources of water accumulation or excess humidity (above 50% relative humidity) must be rectified or else mould growth may recur³. Any initial water infiltration should be stopped and cleaned. Thorough clean up , drying, and/or removal of water damaged materials will prevent or limit mould growth. Emphasis should be on ensuring proper repairs of the building infrastructure, so that water damage and moisture build-up does not recur.

8.0 Verification Report

The Consultant is Responsible to ensure all remediation work is completed and provide the appropriate documentation of completion.

The final Consultant report must document and comment on the mould investigation, delineation, and remediation work undertaken and indicate if the work was effective, thorough and satisfactorily completed in accord with acceptable guidelines and protocols and if the premise s deemed habitable.

References

1. Health Canada, (2004). Fungal Contamination in Public Buildings: Health Effects and Investigation Method, Accessed on 11/25/06 at website: <http://www.hc-sc.gc.ca/ewh.html>
 2. Health Canada, (2004). Indoor Air Quality in Office Buildings: A Technical Guide. Accessed on 11/25/06 at website: http://www.hc-sc.gc.ca/ewh-semt/pubs/air/office_building-immeubles_bureaux/index_e.html
 3. Health Canada, (1987), Exposure Guidelines for Residential Indoor Air Quality Revised July 1989), section 4.A.8. Accessed on 11/25/06 at website: http://www.hc-sc.gc.ca/ewh-semt/pubs/air/exposure-exposition/index_e.html
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Five Levels of Abatement

Five different levels of abatement are described below. The size of the area impacted by fungal contamination primarily determines the type of remediation. The sizing levels below are based on professional judgement and practicality; currently there is not adequate data to relate the extent of contamination to frequency or severity of health effects. The goal of remediation is to remove or clean contaminated materials in a way that prevents the emission of fungi and dust contaminated with fungi from leaving a work area and entering an occupied or non-abatement area, while protecting the health of workers performing the abatement. The listed remediation methods were designed to achieve this goal, however, due to the general nature of these methods it is the responsibility of the people conducting remediation to ensure the methods enacted are adequate. The listed remediation methods are not meant to exclude other similarly effective methods. Any changes to the remediation methods listed in these guidelines, however, should be carefully considered prior to implementation.

Non-porous (e.g., metals, glass, and hard plastics) and semi-porous (e.g., wood, and concrete) materials that are structurally sound and are visibly mouldy can be cleaned and reused. Cleaning should be done using a detergent solution. Porous materials such as ceiling tiles and insulation, and wallboards with more than a small area of contamination should be removed and discarded. Porous materials (e.g., wallboard and fabrics) that can be cleaned, can be reused, but should be discarded if possible. A professional restoration consultant should be contacted when restoring porous materials with more than a small area of fungal contamination. All materials to be reused should be dry and visibly free from mould. Routine inspections should be conducted to confirm the effectiveness of remediation work. The use of gaseous ozone or chlorine dioxide for remedial purposes is not recommended. Both compounds are highly toxic and contamination of occupied space may pose a health threat. Furthermore, the effectiveness of these treatments is unproven. For additional information on the use of biocides for remedial purposes, refer to the American Conference of Governmental Industrial Hygienists' document, "Bioaerosols: Assessment and Control."

4.1 Level I

Small Isolated Areas (10 sq. ft or less) - e.g., ceiling tiles, small areas on walls

- a) Remediation can be conducted by regular building maintenance staff. Such persons should receive training on proper cleanup methods, personal protection, and potential health hazards. This training can be performed as part of a program to comply with the requirements of the OSHA Hazard Communication Standard (29 CFR 1910.1200).
- b) Respiratory protection (e.g., N95 disposable respirator), in accordance with the OSHA respiratory protection standard (29 CFR 1910.134), is recommended. Gloves and eye protection should be worn.
- c) The work area should be unoccupied. Vacating people from spaces adjacent to the work area is not necessary but is recommended in the presence of infants (less than 12 months old), persons recovering from recent surgery, immune suppressed people, or people with chronic inflammatory lung diseases (e.g., asthma, hypersensitivity Pneumonitis, and severe allergies).
- d) Containment of the work area is not necessary. Dust suppression methods, such as misting (not soaking) surfaces prior to remediation, are recommended.
- e) Contaminated materials that cannot be cleaned should be removed from the building in a sealed plastic bag. There are no special requirements for the disposal of mouldy materials.
- f) The work area and areas used by remedial workers for egress should be cleaned with a damp cloth and/or mop and a detergent solution.
- g) All areas should be left dry and visibly free from contamination and debris.

4.2 Level II

Mid-Sized Isolated Areas (10 - 30 sq. ft.) - e.g., individual wallboard panels.

- a) Remediation can be conducted by regular building maintenance staff. Such persons should receive training on proper cleanup methods, personal protection, and potential health hazards. This training can be performed as part of a program to comply with the requirements of the OSHA Hazard Communication Standard (29 CFR 1910.1200).
- b) Respiratory protection (e.g., N95 disposable respirator), in accordance with the OSHA respiratory protection standard (29 CFR 1910.134), is recommended. Gloves and eye protection should be worn.
- c) The work area should be unoccupied. Vacating people from spaces adjacent to the work area is not necessary but is recommended in the presence of infants (less than 12 months old), persons having undergone recent surgery, immune suppressed people, or people with chronic inflammatory lung diseases (e.g., asthma, hypersensitivity Pneumonitis, and severe allergies).
- d) The work area should be covered with a plastic sheet(s) and sealed with tape before remediation, to contain dust/debris.
- e) Dust suppression methods, such as misting (not soaking) surfaces prior to remediation, are recommended.
- f) Contaminated materials that cannot be cleaned should be removed from the building in sealed plastic bags. There are no special requirements for the disposal of mouldy materials.
- g) The work area and areas used by remedial workers for egress should be HEPA vacuumed (a vacuum equipped with a High-Efficiency Particulate Air filter) and cleaned with a damp cloth and/or mop and a detergent solution. All areas should be left dry and visibly free from contamination and debris.

4.3 Level III Large Isolated Areas (30 - 100 square feet) - e.g., several wallboard panels.

A health and safety professional with experience performing microbial investigations should be consulted prior to remediation activities to provide oversight for the project. The following procedures at a minimum are recommended:

- a) Personnel trained in the handling of hazardous materials and equipped with respiratory protection, (e.g., N95 disposable respirator), in accordance with the OSHA respiratory protection standard (29 CFR 1910.134), is recommended. Gloves and eye protection should be worn.
- b) The work area and areas directly adjacent should be covered with a plastic sheet(s) and taped before remediation, to contain dust/debris.
- c) Seal ventilation ducts/grills in the work area and areas directly adjacent with plastic sheeting.
- d) The work area and areas directly adjacent should be unoccupied. Further vacating of people from spaces near the work area is recommended in the presence of infants (less than 12 months old), persons having undergone recent surgery, immune suppressed people, or people with chronic inflammatory lung diseases (e.g., asthma, hypersensitivity Pneumonitis, and severe allergies).
- e) Dust suppression methods, such as misting (not soaking) surfaces prior to remediation, are recommended.
- f) Contaminated materials that cannot be cleaned should be removed from the building in sealed plastic bags. There are no special requirements for the disposal of mouldy materials.
- g) The work area and surrounding areas should be HEPA vacuumed and cleaned with a damp cloth and/or mop and a detergent solution.
- h) All areas should be left dry and visibly free from contamination and debris.

If abatement procedures are expected to generate a lot of dust (e.g., abrasive cleaning of contaminated surfaces, demolition of plaster walls) or the visible concentration of the fungi is heavy (blanket coverage as opposed to patchy), then it is recommended that the remediation procedures for Level IV are followed.

4.4 **Level IV** Extensive Contamination (greater than 100 contiguous square feet in an area)

A health and safety professional with experience performing microbial investigations should be consulted prior to remediation activities to provide oversight for the project. The following procedures are recommended: Personnel trained in the handling of hazardous materials equipped with: Full-face respirators with high efficiency particulate air (HEPA) cartridges Disposable protective clothing covering both heads and shoes gloves Containment of the affected area: Complete isolation of work area from occupied spaces using plastic sheeting sealed with duct tape (including ventilation ducts/grills, fixtures, and any other openings) The use of an exhaust fan with a HEPA filter to generate negative pressurization Airlocks and decontamination room Vacating people from spaces adjacent to the work area is not necessary but is recommended in the presence of infants (less than 12 months old), persons having undergone recent surgery, immune suppressed people, or people with chronic inflammatory lung diseases (e.g., asthma, hypersensitivity Pneumonitis, and severe allergies). Contaminated materials that cannot be cleaned should be removed from the building in sealed plastic bags. The outside of the bags should be cleaned with a damp cloth and a detergent solution or HEPA vacuumed in the decontamination chamber prior to their transport to uncontaminated areas of the building. There are no special requirements for the disposal of mouldy materials. The contained area and decontamination room should be HEPA vacuumed and cleaned with a damp cloth and/or mop with a detergent solution and be visibly clean prior to the removal of isolation barriers. Air monitoring should be conducted prior to occupancy to determine if the area is fit to reoccupy.

4.5 Level V: Remediation of HVAC Systems

4.5.1 A Small Isolated Area of Contamination (<10 square feet) in the HVAC System

- a) Remediation can be conducted by regular building maintenance staff. Such persons should receive training on proper cleanup methods, personal protection, and potential health hazards. This training can be performed as part of a program to comply with the requirements of the OSHA Hazard Communication Standard (29 CFR 1910.1200).
- b) Respiratory protection (e.g., N95 disposable respirator), in accordance with the OSHA respiratory protection standard (29 CFR 1910.134), is recommended. Gloves and eye protection should be worn.
- c) The HVAC system should be shut down prior to any remedial activities.
- d) The work area should be covered with a plastic sheet(s) and sealed with tape before remediation, to contain dust/debris.
- e) Dust suppression methods, such as misting (not soaking) surfaces prior to remediation, are recommended.
- f) Growth supporting materials that are contaminated, such as the paper on the insulation of interior lined ducts and filters, should be removed. Other contaminated materials that cannot be cleaned should be removed in sealed plastic bags. There are no special requirements for the disposal of mouldy materials.
- g) The work area and areas immediately surrounding the work area should be HEPA vacuumed and cleaned with a damp cloth and/or mop and a detergent solution.
- h) All areas should be left dry and visibly free from contamination and debris.
- i) A variety of biocides are recommended by HVAC manufacturers for use with HVAC components, such as, cooling coils and condensation pans. HVAC manufacturers should be consulted for the products they recommend for use in their systems.

4.5.2 Areas of Contamination (>10 square feet) in the HVAC System

A health and safety professional with experience performing microbial investigations should be consulted prior to remediation activities to provide oversight for remediation projects involving more than a small isolated area in an HVAC system. The following procedures are recommended:

- a. Personnel trained in the handling of hazardous materials equipped with:
 - i. Respiratory protection (e.g., N95 disposable respirator), in accordance with the OSHA respiratory protection standard (29 CFR 1910.134), is recommended.
 - ii. Gloves and eye protection
 - iii. Full-face respirators with HEPA cartridges and disposable protective clothing covering both head and shoes should be worn if contamination is greater than 30 square feet.
- b. The HVAC system should be shut down prior to any remedial activities.
- c. Containment of the affected area:
 - i. Complete isolation of work area from the other areas of the HVAC system using plastic sheeting sealed with duct tape.
 - ii. The use of an exhaust fan with a HEPA filter to generate negative pressurization.

- iii. Airlocks and decontamination room if contamination is greater than 30 square feet.
- d. Growth supporting materials that are contaminated, such as the paper on the insulation of interior lined ducts and filters, should be removed. Other contaminated materials that cannot be cleaned should be removed in sealed plastic bags. When a decontamination chamber is present, the outside of the bags should be cleaned with a damp cloth and a detergent solution or HEPA vacuumed prior to their transport to uncontaminated areas of the building. There are no special requirements for the disposal of mouldy materials. The contained area and decontamination room should be HEPA vacuumed and cleaned with a damp cloth and/or mop and a detergent solution prior to the removal of isolation barriers.
- e. All areas should be left dry and visibly free from contamination and debris.

Air monitoring should be conducted prior to re-occupancy with the HVAC system in operation to determine if the area(s) served by the system are fit to reoccupy. A variety of biocides are recommended by HVAC manufacturers for use with HVAC components, such as, cooling coils and condensation pans. HVAC manufacturers should be consulted for the products they recommend for use in their systems.