



**MOULD ASSESSMENT REPORT  
134 Coxwell Avenue  
Toronto, Ontario**

*Prepared for:*

**Mr. Scott Robertson  
Property Administrator**

**Veranova Properties Limited  
505 Consumers Road, Suite 505  
North York, Ontario  
M2J 4V8**

*Performed by:*

**Safetech Environmental Limited**

A handwritten signature in black ink, appearing to read "Wes Henry", is written over a horizontal line.

**Wes Henry, M.H.Sc., CIH, ROH  
Senior Occupational Hygienist**

**SEL Project Number 210107**



July 31, 2007

Veranova Properties Limited  
505 Consumers Road, Suite 505  
North York, Ontario  
M2J 4V8

Attention: Mr. Scott Robertson  
Property Administrator

**Re: Results of Mould Assessment  
134 Coxwell Avenue, Toronto, Ontario**

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## **1.0 BACKGROUND**

On July 16<sup>th</sup>, 2007, personnel from Safetech Environmental Limited (SEL) performed a visual assessment for water damage and mould growth within accessible areas of the residence located at the above noted address. Moisture content readings of building materials were also taken to supplement our visual assessment.

This assessment was performed at the request of Mr. Scott Robertson, Property Administrator for Veranova Properties Limited (the property manager for the mortgagee in possession of the residence) following the discovery of significant water damage and suspect mould growth within the residence.

This assessment has been performed to determine the extent of mould growth present within the areas inspected in order to provide recommendations for appropriate remedial actions and/or to recommend further investigative strategies, if necessary. Assessing potential health risks to potential building occupants associated with the presence of indoor mould growth was beyond the scope of our investigation. Any decisions regarding health risks posed by indoor mould growth and decisions to remove or return people to affected areas should be based on a medical assessment made by a practitioner who is trained in occupational/environmental medicine or a related specialty and are knowledgeable about these types of exposures.

This report summarizes results of our visual assessment and moisture measurements.

## 2.0 INTRODUCTION

Fungi can be found almost everywhere in indoor and outdoor environments. They are a naturally occurring and essential part of our environment and include a wide variety of organisms such as moulds, yeasts and mushrooms. Fungi act as decomposers in the outdoor environment, breaking down dead organic material (such as leaves, wood and other plant debris) which they use as a food source.

Mould spores are brought into indoor environments through ventilation systems, open windows or doors, or tracked in on footwear. If conditions exist that allow fungi to grow indoors, concentrations will increase to levels that are typically not found in buildings. Mould growth indoors primarily occurs when water damages cellulose-containing building materials and/or furnishings (such as wood, drywall, wallpaper, ceiling tiles, etc.) due to catastrophic or chronic events such as leaks, floods, condensation (associated with high humidity or cold spots), improper design or operation of humidification systems and building envelope failures. Under these conditions fungal growth may present a risk to the building structure itself (through decomposition of building materials) as well as to occupants in the building (through potentially adverse health effects).

### 2.1 Health Effects Associated with Exposure to Mould

Health effects caused by inhalation of fungal spores (and other fungal fragments) most commonly results in allergic type reactions such as runny nose, cough, congestion, eye irritation and aggravation of asthma, headache and fatigue<sup>8</sup>. Exposure to very high concentrations of fungi (such as those that may be observed during remediation of contaminated building materials) can result in more serious health effects such as Organic Dust Toxic Syndrome (ODTS) or Hypersensitivity Pneumonitis (HP), where flu-like symptoms are exhibited. Serious infections have also been documented to occur from airborne exposure to several species of mould. However, such serious invasive infections are only noted to occur to individuals whose immune system is seriously compromised.

Health effects posed by exposure to toxigenic moulds are not well understood. Controversy in the medical community currently surrounds the possibility that airborne fungal exposure can result in more serious health effects due to the ability of some species (such as *Aspergillus flavus*, *Aspergillus fumigatus* and *Stachybotrys chartarum*) to produce mycotoxins under favourable growth conditions. These so-called "toxic moulds" have been implicated in causing serious health effects such as bleeding lungs in infants, liver damage, central nervous system damage, and cancer. However, any causal association for such health effects remains weak and unproven from inhalation exposure at levels that one would expect to find in mould-contaminated buildings.



## 2.2 Mould Assessment & Remediation Guidelines

Regardless of the type or severity of health effects that may be caused by exposure to mould, mould growth inside a building should be considered unacceptable from a building operations and maintenance standpoint as well as from a health risk standpoint. In Ontario, the Ministry of Labour (MOL) recognized this and in September of 2000 issued an alert regarding mould titled "*Mould in Workplace Buildings*". This alert outlined potential health effects caused by mould exposure, causes of mould growth in buildings and the need to properly remediate mould-contaminated building materials. The requirement for employers to provide a safe and healthy workplace for all employees was indicated by the MOL within this alert by citing section 25(2)(h) of the Occupational Health and Safety Act, which states that employers are required to take every precaution reasonable in the circumstances for the protection of workers. This includes protecting workers from mould in workplace buildings.

Further to the MOL alert, several government agencies and special interest groups have developed guidelines for the proper assessment and remediation of mould-contaminated buildings. In Canada, recent guidelines have been published by the Canadian Construction Association (CCA) entitled "*Mould Guidelines for the Canadian Construction Industry*" (March 2004) while in Ontario the Environmental Abatement Council of Ontario (EACO) has published "*EACO Mould Abatement Guidelines*" (April 2004). Currently, this guideline is being considered by the MOL for adoption as a recognized code of practice.

The above guidelines are similar in nature and incorporate elements common to several other guidelines issued by groups such as Health Canada<sup>4</sup>, the Manitoba Department of Labour<sup>7</sup>, the New York City Department of Health<sup>8</sup>, the Institute of Inspection, Cleaning and Restoration Certification (IICRC)<sup>6</sup>, and the U.S. Environmental Protection Agency (EPA)<sup>10</sup>. Common to all is the need to remediate contaminated building materials under controlled conditions, with the extent of safety measures employed based partially on the extent of contamination. In general, more stringent remediation methods, engineering controls and worker protection is required the more extensive the mould contamination. These requirements have generally been distinguished in the guidelines by employing different Levels of Remediation (e.g., Level 1, 2 or 3).

SEL recognizes and follows the practices and procedures outlined in the most current mould remediation guidelines available. General recommendations for remediation procedures, engineering controls and work practices that are common to several of the above-mentioned guidelines and used by SEL are summarized below in Table I.

**TABLE I**  
**Summary of Mould Remediation Requirements by Level of Remediation**

Level of Remediation	Level 1	Level 2	Level 3
<b>Estimated Area of Mould Growth</b>	<10 ft <sup>2</sup> (<1 m <sup>2</sup> )	10-100 ft <sup>2</sup> (1-10 m <sup>2</sup> )	>100 ft <sup>2</sup> (>10 m <sup>2</sup> )
<b>Level of Containment</b>	Polyethylene drop sheet	Polyethylene enclosure	Polyethylene enclosure and two-chambered worker/waste decontamination facilities
<b>Engineering Controls</b>	Turn off HVAC system and seal over openings, use dust suppression methods	Isolate/seal the HVAC system, use dust suppression methods, maintain negative pressure through use of HEPA vacuum or HEPA-filtered negative air unit	Isolate/seal the HVAC system, use dust suppression methods, maintain negative pressure (that is to be continually measured and recorded) through use of HEPA-filtered negative air unit
<b>Worker Protection</b>	Dust impermeable gloves, half-face air purifying respirator (N95 minimum), full body dust-impervious coveralls	Dust impermeable gloves, half-face air purifying respirator (100 Series), full body dust-impervious coveralls and boot covers or separate work boots	Dust impermeable gloves, full-face PAPRs or full face non-powered air purifying respirator (100 Series), full body dust-impervious coveralls and boot covers or separate work boots
<b>Clean Up Procedures</b>	Double-bag waste in 6-mil polyethylene bags, HEPA-vacuum and/or wet wipe exposed surfaces with a detergent solution	Double-bag waste in 6-mil polyethylene bags, HEPA-vacuum and wet wipe exposed surfaces with a detergent solution	Bag waste in 6-mil polyethylene bag within work area and then within double bagging room of waste decontamination facility, HEPA-vacuum and wet wipe exposed surfaces with a detergent solution
<b>Project Quality Assurance</b>	Project authority should consider whether removal of occupants adjacent to the work area is necessary.	Project authority should consider whether removal of occupants adjacent to the work area is necessary. Consult with qualified Health & Safety professional prior to remediation work and for monitoring of compliance with guidelines. A competent supervisor to be present during all contaminated work and a competent person should inspect the work area for enclosure defects on a regular basis.	Project should be conducted following a site-specific work plan or specification. Project authority should consider whether removal of occupants adjacent to the work area is necessary. Consult with qualified Health & Safety professional prior to remediation work and for monitoring of compliance with guidelines. A competent supervisor to be present during all contaminated work and a competent person should inspect the work area for enclosure defects on a regular basis. Project authority or representative should periodically inspect work activities and inspect the work area for acceptable completion via visual inspection and possibly clearance testing (air and/or surface sampling).

It should be noted that the remediation procedures summarized in Table I are not meant to be comprehensive. The summary is general in nature only, as specific recommended requirements vary slightly from guideline to guideline. Each applicable guideline should be consulted for a full description of their recommended remedial procedures. In addition, the procedures outlined above may not necessarily reflect procedures to be employed on every project, as specific procedures to be followed should be determined on a project by project basis, based on professional judgment. The general procedures outlined above also do not account for specific conditions that may be encountered, such as remediation in locations where immuno-compromised or other susceptible occupants may be present (e.g., hospitals or other health care facilities) or remediation of biohazards other than mould that may be present due to sewer backups, environmental floods or bird and bat droppings. Under these conditions, additional precautions may apply.

### **3.0 MOULD ASSESSMENT METHODOLOGY**

Our assessment for the determination of the presence of mould growth included all easily accessible areas of the residence. The presence of furnishings and significant quantities of stored items/materials limited access to building surfaces within the basement area of the residence. In order to assess the potential for and extent of mould growth (if any), our assessment consisted of a visual inspection of accessible areas and moisture content readings of representative building materials. Both of these activities are further described below.

#### **3.1 Visual Assessment**

The focus of our visual assessment was to identify and quantify locations within the areas assessed that may be affected by water damage and/or mould growth. Evidence of water damage may include water staining and/or discolouration to building material surfaces and deterioration to building surface components (such as cracking or peeling paint or plaster, delamination of wallpaper, efflorescence to plaster and concrete surfaces, etc.). Degraded building materials (such as soft or crumbling drywall and plaster) also provide an indication of potential chronic water infiltration.

Mould growth was visually identified as spotty discolouration to surfaces or as a mass of fuzzy discolouration, depending on the extent of growth. The colour of mould growth will vary depending on the mould species present and the material that it is growing on. It is commonly found to be black, grayish, white, brown or green. Differentiation between mould growth and other staining or discolouration was made based on past experience and/or by confirmation of mould growth on similar surfaces through surface sampling. Visible identification of mould growth should be viewed as 'preliminary' or 'suspect' until positively identified through laboratory analysis.

Special attention was paid to building materials and furnishings that are typically conducive to mould growth due to their cellulose content. This included materials such as drywall, cardboard, lay-in ceiling tiles, carpeting, wallpaper, wood framing, plywood, particleboard, oriented strand board (OSB), etc., if present.

Our visual assessment was primarily non-destructive in nature. Locations where there is visual evidence of water damage and/or elevated moisture content readings indicate the potential for “hidden” mould growth, which could exist between building elements, underneath the surface of the affected material or within wall/ceiling cavities, etc. Therefore, minor intrusive investigation was performed within some areas of the residence where our visual assessment and/or moisture content readings warranted further investigation. This primarily consisted of removing portions of plaster walls to observe conditions within wall cavities.

### **3.2 Moisture Content Readings of Building Materials**

In order to determine the moisture content of building materials present within the areas assessed, moisture content (MC) readings were taken using a Protimeter Moisture Meter System (MMS). This unit is able to detect moisture content in building materials using two modes of moisture measurement. For the detection of moisture beneath surfaces or from hard surfaces such as concrete, ceramics, masonry and plaster, the instrument is operated in *Search Mode*. This mode uses radio frequency technology to give instant relative measurements of moisture on a relative scale reading of 0 to 1,000. When the MMS is operated in *Measure Mode*, pin-type conductivity electrodes are used to give precise wood moisture equivalent (WME) measurements from non-conductive materials such as wood, drywall and insulating materials. WME measurements are reported in the range of 7.8 to 99.9% in increments of 0.1%. Values obtained above typical wood fibre saturation (30%) are relative readings.

For wood products such as framing, plywood and oriented strand board, typical MC readings obtained from these “dry” materials (stabilized with normal indoor environments) are 8-14%, 15% and 8-11% respectively. Generally, wood materials are considered dry enough when readings are within 4% of the dry standard, and moisture content below 20% inhibits the growth of destructive fungi<sup>5</sup>.

To determine if building materials other than wood products have elevated moisture levels, MC readings obtained with the MMS are compared against MC values of similar products that are known to be dry. For example, typical “dry” drywall has a WME of approximately 10%. Thus, values obtained above 10% indicate elevated MC. In general, for cellulose-based products, WME values below 10% should be considered low or “normal”, values between 10 and 15% represent “borderline” conditions where there may be elevated moisture conditions, values between 16 and 20% represent “suspect” conditions where fungal growth may start to occur, while values above 20% represent “fungal growth” conditions.

Results of MC readings were used in conjunction with our visual assessment results to further define the extent of water damage. Elevated readings indicate recent or chronic water damage. In addition, elevated MC readings indicate the potential for hidden mould growth on the unexposed side of the material being measured. It should be noted that even if normal MC readings are obtained, areas that have been subjected to water damage in the past and have since dried out may have hidden mould growth. Under these conditions, further assessment activities (such as intrusive investigation) would have to be performed to rule out the presence of mould growth.

### 3.3 Area Classification and Estimation of Level of Remediation

Each of the individual areas assessed was assigned a classification number (i.e., 0, 0+, 1, 1+, 2, 2+, 3 or 3+) by SEL based on the extent of visible mould growth and water damage determined to be present. This classification system has been developed based on a number of current mould remediation guidelines but also accounts for possible undiscovered or hidden mould growth (if applicable). A Level of Remediation was then estimated based on a combination of all information obtained from our assessment. SEL's classification system is summarized below in Table II.

**TABLE II**  
**Summary of Area Classification and Level of Remediation**

Area Classification	Estimated Extent of Visible Mould Growth*	Potential for Additional Hidden Mould Growth**	Level of Remediation***
0	None Detected	Not likely	0
0+	None Detected	Possible	0-3
1	<10 ft <sup>2</sup> (1 m <sup>2</sup> )	Not likely	1
1+	<10 ft <sup>2</sup> (1 m <sup>2</sup> )	Possible	1-3
2	10-100 ft <sup>2</sup> (1-10 m <sup>2</sup> )	Not likely	2
2+	10-100 ft <sup>2</sup> (1-10 m <sup>2</sup> )	Possible	2-3
3	>100 ft <sup>2</sup> (10 m <sup>2</sup> )	Not likely	3
3+	>100 ft <sup>2</sup> (10 m <sup>2</sup> )	Possible	3

\*Estimation includes accounting for mould growth in "hidden" locations if assessment techniques (e.g., borescope or intrusive investigation) allow for inspection and identification of mould growth. \*\*Elevated moisture content readings and/or visible water damage to surfaces that are typically conducive to mould growth indicates the potential for hidden mould growth additional to that identified. \*\*\*Actual level of remediation is dependant on the extent of visible and anticipated hidden mould growth.

### 4.0 MOULD ASSESSMENT RESULTS

Results of our mould assessment are summarized below in Table III. Each area assessed has been classified according to our assessment criteria outlined in Table II. In addition, an estimated Level of Remediation has been provided based on our results. Locations where photographs (P#) were taken that support our observations are indicated in the Table and are included in Appendix I.





**TABLE III**  
**Summary of Mould Assessment Results**  
**134 Coxwell Avenue, Toronto, Ontario**  
**July 16<sup>th</sup>, 2007**

<b>1. Exterior</b>	<b>Area Classification: 1+</b>	<b>Level of Remediation: 0</b>
<p><b>Observations:</b> The front (east side) of the residence exhibited some damage to the vinyl siding on the second floor level and the shingles associated with the front porch were noted to be deteriorating (P1). The north side of the porch itself was noted to be deteriorating, with suspect mould growth noted to sheathing materials located behind the siding (P2). Paving stones along the north side of the residence were noted to be sloping towards the foundation at the back side of the house, with visible greenish algae-like discolouration noted in this area. Several areas of the cement parging were also cracked. The basement window was missing on the north side, near the front of the residence.</p> <p>Exterior siding and bricks at the back (west side) of the residence appear to be in satisfactory condition although some re-pointing may be required in the centre, near the chimney. Building materials around the back entrance are deteriorating and portions of siding area missing.</p> <p>There was limited access to the south side of the residence, which was sheathed in vinyl siding over the original brick exterior finish. The lower sections of siding were noted to be bowed out significantly, with minor brick and other debris noted along the bottom of the wall. It appears from our visual observation as well as conditions noted within the residence (see below) that the south exterior brick wall is deteriorating significantly.</p>		
<p><b>Remedial Action:</b> Further investigate the south brick wall and the front porch to determine structural integrity and feasibility for repair. Other areas of damaged siding, roofing, windows and concrete as noted above also require repair. The full extent of damage present to exterior walls is likely hidden by the presence of the vinyl siding.</p>		
<b>2. Attic</b>	<b>Area Classification: 0+</b>	<b>Level of Remediation: 0</b>
<p><b>Observations:</b> Access into attic space was restricted to small access hatch in washroom. Wood plank sheathing and wood framing in the attic exhibited visible evidence of dark staining, discolouration and weathering, but no visible evidence of obvious mould growth.</p>		
<p><b>Remedial Action:</b> No further action necessary.</p>		
<b>3. 2<sup>nd</sup> Floor</b>	<b>Area Classification: 2+</b>	<b>Level of Remediation: 3</b>
<p><b>Observations:</b> 2<sup>nd</sup> floor consists of three bedrooms and a washroom. Building surfaces present within the bedrooms included wood or vinyl flooring, and plaster walls and ceiling. Surfaces exhibited varying degrees of debris accumulation, with minor dirt and suspect mould noted to window sill and trim (quarter round) around the window in the centre bedroom. There was no visible evidence of obvious mould growth to other areas within the bedrooms although there were signs of suspect water damage, with peeling and cracking to plaster wall and ceiling surfaces within each room. Large cracks were present to the south wall within the back bedroom area. Relative readings taken from representative plaster wall and ceiling surfaces within these rooms indicated dry conditions (&lt;100 REL). Moisture content readings taken from wood floors also indicated dry conditions (&lt;7.8%).</p> <p>Sections of the washroom wall around the tub were missing, with sections of wallboard present within the tub from the removed section of wall exhibiting visible evidence of suspect mould growth. Remaining portions around the tub were deteriorated, with visible mould growth present within the grout surrounding the ceramic wall tiles (P3). Floor and ceiling surfaces did not exhibit any visible evidence of obvious mould growth although paint on the plaster ceiling was noted to be peeling heavily.</p>		

Building surfaces within the bedroom corridor included wood floors and plaster walls and ceiling. Ceiling and floor surfaces were found to be free of significant water damage and obvious visible mould growth. The south wall of the corridor exhibited signs of heavy water damage, with heavy peeling of paint and staining to the plaster wall, with areas of visible mould growth (**P4**). Relative moisture readings taken from areas of the south wall exhibiting damage indicated elevated levels (REL 170 – 180) as compared to other location (REL <100).

**Remedial Action:** Remove south wall within the corridor area and surface clean interior wood framing or remove if found to be heavily contaminated. Structural integrity of this south wall should be further investigated prior to performing any type of removal. The full extent of remediation required along the south wall is unknown due to the potential for significant mould growth to be hidden behind the wall and therefore additional removal along this wall (and into the bedrooms) may be required. Walls surrounding the tub and the tub itself should also be removed, with remaining surfaces (interior framing, walls, ceiling and floor surfaces) surface cleaned of any remaining mould growth and debris accumulation. Surface clean and/or remove window sill/trim within centre bedroom. Remediation of these areas should be performed following Level 3 mould remediation activities.

#### 4. Main Floor

Area Classification: 2+

Level of Remediation: 3

**Observations:** Building materials in the front porch include a wood floor and wood paneling on walls and ceiling. Minor water staining was visible to the surface of the ceiling and east wall, and the drapes over the front window were visibly water stained. The metal window frame and wood window sill exhibited dirt and debris accumulation, with possible mould growth on the surfaces. Moisture content readings of the window sill indicated dry conditions (13.3% to 13.7%) at the time of our assessment. Minor suspect mould growth (light spotting) was identified to a portion of wood trim and to the surface of the wood paneling along the south wall (behind the cabinet that was present). The lower southwest brick wall was damaged, creating a hole in the wall, leading into the adjacent Family Room. A section of wood paneling loose at the northeast corner of the porch revealed that wood framing and the exterior sheathing was water damaged and deteriorating at this location.

Building surfaces throughout the main floor areas include vinyl floor tiles, plaster walls and plaster ceiling. The main entrance/corridor area exhibited typical cracking to plaster walls but no visible evidence of significant water damage or obvious mould growth. Moisture content readings of the plaster walls (REL <150), wood baseboards (<7.8%) and floor (12.2% to 14.6%) within the corridor indicated normal levels at the time of our assessment. Minor cracking to plaster wall surfaces was noted in the corridor area as well as in the other rooms on the main floor. Building surfaces within the front Family Room and Dining Room did not exhibit any significant stains or visible evidence of obvious mould growth to the surface of the wall. However, an area of repair to a crack on the south wall within the Family Room was present. Moisture content readings taken along the bottom of the wall at this location indicated elevated levels (17.9% to 32.0%). A portion of the texture coat wall was removed and a cellulose backing (possibly wallpaper) present underneath exhibited visible evidence of minor water damage and suspect mould growth (**P5**). Destructive testing performed at the bottom of the wall at this location found the wall to be soft and deteriorated. The brick exterior wall at the location of destructive testing was heavily deteriorated and bricks were noted to have fallen down (**P6**), with light from the outside visible. Elevated moisture readings continued along the bottom length of the south wall within the Family and Dining Room and the exposed brick along the south wall of the Kitchen was visibly deteriorated (**P7**). The drywall bulkhead along the south wall in the Kitchen exhibited visible evidence of obvious mould growth (**P8**) and moisture readings taken at this location were elevated (14.5% to 21.8%).

**Remedial Action:** Surface clean window sill and frames within the front porch. Remove sections of water damaged and mould-contaminated exterior sheathing. All wood paneling on the ceiling and walls is recommended to be removed to allow for further investigation as the structural integrity of the porch is unclear and should be investigated further prior to performing any mould remediation activities. If remediation is contemplated it is recommended to be performed following Level 3 mould remediation protocols in conjunction with other main floor areas.

Remove the entire south wall and water damaged/mould contaminated bulkhead within the kitchen. Remaining surfaces (interior wood framing) should be cleaned of any remaining mould growth and debris accumulation. Remediation of the main floor is recommended to be performed following Level 3 mould remediation protocols. The structural integrity of the south wall should be investigated further prior to performing any mould remediation activities.

<b>5. Basement</b>	<b>Area Classification: 3</b>	<b>Level of Remediation: 3</b>
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**Observations:** Access to basement areas was limited due to the presence of a significant quantity of stored materials. However, it was evident that significant water damage and mould growth was present throughout the basement. Heavy mould growth was present on drywall walls (**P9, P10**) and ceiling and water was noted to be accumulating on areas of the floor along the south wall (**P10**). Moisture content readings taken from drywall walls and ceiling (16% to >60%) and to wood framing (14%-26%) indicated elevated levels at conditions supportive of mould growth. Areas of the wood support beams along the south side of the basement were deteriorated and rotted (**P11**) and moisture content readings of the beams were elevated (15.6% to 20.7%). Suspect asbestos-containing pipe insulation associated with radiator heating lines was observed to be in poor condition (**P12**).

**Remedial Action:** Remove all building materials back to base building throughout the basement areas. This would include removal of all drywall, wood framing, flooring, insulation, etc. Remaining building materials should then be surface cleaned of dirt and debris accumulation and any visible mould growth. Any heavily water damaged, mould-contaminated or rotted sections of beams should be removed and replaced while other wood surfaces should be surface cleaned of any visible mould growth. All stored materials within the basement are also recommended to be removed and disposed of as mould-contaminated waste. Remediation of the basement is recommended to be performed following Level 3 mould remediation protocols. The structural integrity of the wood joists and water penetration issues associated with the foundation wall/south wall should be investigated further prior to performing any mould remediation activities.

## 5.0 CONCLUSIONS & RECOMMENDATIONS

Results of our visual assessment indicated that moderate to heavy water damage and mould growth was present throughout all floors of the residence. Mould growth was most readily apparent in the basement of the residence, where water infiltration and accumulation along the south wall has led to mould growth on drywall walls/ceiling as well as to other susceptible building materials (such as wood framing) and stored materials present within the basement. Based on the extent of water damage and mould growth identified within the basement it is recommended that remediation in this area be performed following Level 3 mould remediation activities.

Water damage and mould growth on the main and second floors of the residence appear to be primarily associated with the south wall, where it was evident from our visual inspection, moisture content readings and limited destructive testing that a large percentage of the south exterior plaster wall is affected by water damage and mould growth. Additional areas where mould growth was visibly evident included the 2<sup>nd</sup> floor washroom (where water damage from the tub/shower has affected surrounding building materials and resulted in mould growth on some susceptible surfaces) and the front porch (where exterior sheathing, window frames/sill and wood paneling on walls and ceiling have been affected). Based on the extent of water damage noted on the 2<sup>nd</sup> floor and main floor of the residence, remediation of affected areas is also recommended to be performed following Level 3 mould remediation activities.

Level 3 mould remediation procedures require complete isolation of the work areas with a polyethylene enclosure that is maintained under negative pressure using HEPA-filtered negative pressure filtration units (NPFUs). Building surfaces that are not to be removed as part of remediation should be sealed with polyethylene in order to protect against contamination and ease final cleaning activities. The entrance to the work areas should be separated from other areas of the residence by a two-stage worker decontamination chamber. A two-stage waste decontamination chamber should also be constructed for removal of contaminated items and building materials.

Remediation within the basement area would consist of complete removal of all building finishes (such as drywall, wood framing, etc.) back to base building and cleaning remaining surfaces of any debris accumulation or possible mould growth (foundation walls, floor, wood beams and deck). As indicated in our assessment, suspect asbestos-containing pipe insulation was noted to be in poor condition within the basement area and therefore is also recommended to be addressed during remediation activities within the basement. Remediation of the main and second floors would include removal of affected sections of the south plaster wall and surface cleaning remaining elements (wood framing) of any visible mould growth, or removing sections if found to be heavily mould contaminated. Affected building materials adjacent to the south wall (primarily the drywall bulkhead in the Kitchen) also require removal.

Additional remedial work would include removing the walls surrounding the 2<sup>nd</sup> floor tub and surface cleaning remaining wall, ceiling and floor surfaces within this area of any suspect mould growth (or removing if found to be heavily mould contaminated). Similarly, removal of water damaged and mould contaminated exterior wall sheathing, surface cleaning of windows and sills, and removal of wood wall/ceiling paneling is recommended to be performed within the front porch, with further investigation and remediation of materials behind, if required. Remediation of these areas is recommended to be performed following Level 3 mould remediation procedures in conjunction with remediation of the south wall on each floor.



At the completion of bulk removal all surfaces remaining within the areas of remediation should be cleaned of visible debris accumulation using HEPA-vacuuuming and damp-wiping techniques. We recommend that a three-stage decontamination process be performed as a minimum, consisting of an initial HEPA-vacuuuming, followed by damp wiping with clean cloths and a mild detergent solution, followed by a second HEPA-vacuuuming. Duct cleaning of the forced air furnace systems are also recommended to be performed as a precautionary measure upon the completion of remediation activities given that the furnaces are located in a mould contaminated area of the basement.

Workers performing Level 3 mould remediation should wear dust-impermeable gloves, full body dust-impervious coveralls, disposable boot covers a full face air purifying respirator fitted with 100 Series Filter cartridges. Individuals who perform mould remediation should be fit to work with potential mould exposure and should be properly trained in the hazards of mould remediation and the proper remediation procedures to be followed. Workers should be familiar with the health hazards posed by mould exposure, personal protection equipment (including proper respirator use and fitting), and remediation, clean up and waste handling and disposal practices.

As indicated in the EACO and CCA guidelines, consultation with a qualified Health & Safety professional with experience performing microbial investigations and remediation should be consulted prior to remediation work to provide quality assurance for the project and monitoring of compliance with guidelines. SEL would be pleased to provide these services for Veranova Properties Ltd. throughout the duration of the remediation project. Such services could include design of a site-specific scope of work, contract specifications and tendering services, pre- and post-remediation site inspections and clearance testing. An independent visual inspection of the work area for acceptable completion and clearance testing (consisting of air and surface sampling) is recommended as a minimum prior to reinstatement with new building materials.

Of greater concern than the presence of water damage and mould growth are the potential structural issues associated with the south wall and possibly the front porch, as our destructive testing indicated that the south brick exterior wall is significantly deteriorated in some areas. Wood floor joists visible within the basement also indicate the presence of rotting and deterioration along the south perimeter wall. As such, it is recommended that a structural engineer be retained to determine the underlying structural deficiencies associated with the residence prior to performing any remediation activities. Remediation of the property should not proceed until all structural concerns are addressed and corrected. In our opinion, the cost of performing structural repair followed by remediation may be cost prohibitive compared to demolition.



In addition to the above recommendations associated with mould remediation activities we recommend that bulk sampling of potential asbestos-containing materials (such as pipe insulation, texture coat and plaster) that will be disturbed during mould remediation be performed to determine the asbestos content of these materials prior to mould remediation to ensure compliance with Ontario Regulation 278/05, Designated Substance - Asbestos on Construction Projects and in Buildings and Repair Operations - made under the Occupational Health and Safety Act. If demolition of the residence is contemplated a complete and thorough asbestos survey is recommended to be performed, as our current sampling protocol would only focus on mould-impacted areas.

## **6.0 LIMITATIONS**

The investigations, assessments and recommendations detailed in this report were carried out in a manner consistent with the level of care and skill normally exercised by reasonable members of the environmental and industrial hygiene consulting profession currently practicing under similar conditions in the area. There are no other warranties, expressed or implied, that apply to the professional services provided under the terms of our assignment and included in this report.

In preparing this report, Safetech Environmental Limited relied on information supplied by others, including independent testing laboratories. Except as expressly set out in this report, we have not made any independent verification of such information.

The investigation, assessments and recommendations in this report have been made based on conditions observed at the time of the assessment and are limited to the areas investigated. Areas of mould growth may exist in areas not assessed by Safetech Environmental Limited. Mould growth conditions can change with time and mould growth additional to that noted in this report may occur if water infiltration/humidity conditions persist or reoccur. Unaccounted mould growth may also be present in the areas assessed due to concealed or subsurface conditions that can vary from those encountered (if accessed).

The investigation, assessments and recommendations in this report have been made in the context of existing industry accepted guidelines which were in place at the date of this report. The investigation did not take account of any government regulations not in effect or not generally promulgated at the date of this report.

This report is for the sole use of the person or entity to whom it is addressed. No other person or entity is entitled to use or rely upon this report.



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**APPENDIX I**  
**Site Photographs**

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P1

Front of Residence: Vinyl siding damaged above 2<sup>nd</sup> storey window. Shingles associated with front porch are damaged.



P2

Front Porch: Visible mould growth to lower section of exterior sheathing.



P3

**2<sup>nd</sup> Floor Washroom: Walls around tub are deteriorated, with visible mould growth present within grout lines around ceramic tiles.**



P4

**2<sup>nd</sup> Floor Corridor: Heavy water damage and obvious mould growth to surface of south plaster wall.**



P5

**Family Room: Water damage and minor suspect mould growth behind peeled wallpaper.**



P6

**Family Room: Heavily deteriorated exterior brick wall behind deteriorating plaster wall.**



P7

Kitchen: Deteriorating brick wall at floor level.



P8

Kitchen: Heavy mould growth to drywall bulkhead.



**P9** Basement – Heavy mould growth to drywall wall and to stored materials in basement.



**P10** Basement – Heavy mould growth to drywall walls. Water accumulation on floor at south wall.



P11

Basement – Wood floor joists for main floor rotted in areas along south wall.



P12

Basement: Suspect asbestos-containing pipe insulation in poor condition.