

APPENDIX ONE – ADDRESSING ENVIRONMENTAL HEALTH ISSUES IN SCHOOLS

Children spend their time in many different settings, at home, in early learning and child care facilities, outdoors in their communities and in the school environment. The table below focuses on one setting - the school environment - as an example of health risks and possible remedies. It summarizes a range of potential exposures and related action steps that can be taken in the school environment. It has been prepared as a template for application to other settings.

Note that specific actions noted in column three may be governed by specific provincial or federal law, regulations or guidelines, or industry codes of practice. There may be specific requirements noted in regulatory, policy or guidance documents for dealing with potentially hazardous circumstances (such as mould abatement or during renovations) or for dealing with hazardous materials/substances (such as lead, asbestos, pesticides, etc).

Table A.1: Potential Environmental Threats in Schools: Concerns and Actions for Prevention

Indoor Exposures		
Potential Concern	Why it is a Concern?	Action to reduce the concern.
Mould	Mould growth is related to moisture problems (e.g. high humidity, water damage). Mould growth in portables has been a particular problem in the past. Health effects include allergic reactions and respiratory symptoms.	<input checked="" type="checkbox"/> Proactively address moisture problems (e.g. flooding, leaks) ensuring no area remains damp for more than 24 hours. <input checked="" type="checkbox"/> Prevent mould by keeping ventilation systems dry and clean <input checked="" type="checkbox"/> Remove identified mould growth promptly

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Indoor pesticide use	Pesticides, in particular the organophosphate insecticides, have been associated with a wide range of health effects including some cancers and possible impacts on developing brain and nervous system. Indoor pesticides are particularly of concern because they can present a greater exposure risk, due to poor ventilation and slower biodegradation.	<ul style="list-style-type: none"> <input checked="" type="checkbox"/> Adopt an Integrated Pest Management (IPM) approach focusing on prevention (e.g. caulking cracks, eliminating pest habitats and food sources) <input checked="" type="checkbox"/> If pesticide use becomes necessary for health or safety reasons, choose non-toxic or least toxic products. If non-toxic alternatives are not available, seek out options that present the lowest exposure risk, such as baits, gels or pastes, rather than sprays. Apply pesticides only at times when children are not in school (e.g. weekends, holidays). Ensure that children are not allowed to enter any locations where pesticide applications have been necessary.
Cleaning products	Studies have associated cleaning products with a range of health effects including decreased respiratory function. Many such products contain volatile organic carbons (VOCs) such as formaldehyde.	<ul style="list-style-type: none"> <input checked="" type="checkbox"/> Adopt and follow a purchasing policy, choosing only non-toxic or least toxic products (e.g. low VOC products) <input checked="" type="checkbox"/> Ensure products are stored appropriately and are not accessible to students.
Classroom materials (e.g. Arts & Science supplies)	Arts (e.g. markers, paints, glues) and science (e.g. solvents, acids, compressed gasses) supplies may release potentially harmful substances during their use and storage. For example, mercury has been found in some U.S. science classrooms where there was inadequate clean-up after thermometers broke.	<ul style="list-style-type: none"> <input checked="" type="checkbox"/> Adopt and follow a purchasing policy, choosing only non-toxic or least toxic products <input checked="" type="checkbox"/> Ensure supplies are stored according to manufacturer's instructions and that storage areas are separate from classrooms and properly ventilated

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Lead Paint	Schools built before 1976 (but especially before 1960) are likely to have painted surfaces that contain some lead. Lead is a known neurotoxin. Lead dust can be released from normal decay of old painted surfaces. Renovations that involve old painted surfaces can generate substantial amounts of lead dust indoors.	<ul style="list-style-type: none"> <input checked="" type="checkbox"/> Wipe painted surfaces with a damp cloth to clean dust (do not dry dust or scrape the paint). <input checked="" type="checkbox"/> Assume all old paint contains lead. Intact painted surfaces are better dealt with by painting over them with new, lead-free paint that seals in the old lead paint. <input checked="" type="checkbox"/> Check for peeling paint in areas where children might gain access. <input checked="" type="checkbox"/> Dry scrape but never power sand to remove any flaking and peeling paint. Use HEPA-filtered vacuum cleaners for cleaning up paint flakes and dust. Dispose of old paint flakes or dust as hazardous waste. <input checked="" type="checkbox"/> During renovations, thorough dust control measures should also be in place.
Lead in Drinking Water	Schools built before the 1950s are more likely to have plumbing pipes made of lead. Schools in older areas of the City may have municipal water supply pipes made of lead. Since the 1950s, lead solder was used on copper plumbing. Lead solder was banned in the late 1980s. Water that has been sitting in pipes for several hours may contain dissolved lead. Lead is a known neurotoxin.	<ul style="list-style-type: none"> <input checked="" type="checkbox"/> Ensure any school built before 1990 has, and is following, a policy on daily flushing (running the water for a few minutes every morning) of pipes. Priority should be given to drinking water fountains, or other sources where water is likely to be ingested (e.g. taps for filling water bottles). This practice gets rid of water that has been sitting in the pipes and may contain dissolved lead.

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Building Materials	New materials, adhesives etc. may release volatile organic compounds (VOCs). Carpeted surfaces may harbour contaminants and dust mites and other allergens. Older carpets can contain up to 400 times more dust and associated contaminants than an adjoining area of bare floor.	<ul style="list-style-type: none"> <input checked="" type="checkbox"/> Choose products with low levels of emissions where possible. <input checked="" type="checkbox"/> When materials with potentially harmful emissions are used, increase ventilation and allow time for off-gassing before the area is reoccupied. <input checked="" type="checkbox"/> Remove carpeting where possible. If carpeting is necessary, choose low VOC carpets that have not been subject to chemical treatments (e.g. stain resistance) <input checked="" type="checkbox"/> Vacuum carpets frequently using a High Efficiency Particulate Air (HEPA) filter
Maintenance and Renovation Activities	Renovations can release dust, asbestos, mould and lead from paint into the air. New materials may release VOCs. Concentrations of potentially toxic substances may diminish with time as the substance becomes diluted and ventilated from the building.	<ul style="list-style-type: none"> <input checked="" type="checkbox"/> Adopt and follow a policy that limits potential exposures (e.g. painting, renovations) to times when children are not in school (e.g. holidays, on weekends) whenever possible <input checked="" type="checkbox"/> Prior to renovation, ensure inspection of work areas for hazardous materials including asbestos, lead, mould, etc. <input checked="" type="checkbox"/> Ensure careful dust control and clean-up practices during all renovations

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Ventilation systems	Ventilation systems play an important role in improving indoor air. Two approaches may be used. Passive systems rely on windows and air leaks, and are used by the older schools in Toronto. Mechanically-based systems may include central exhausts, or Heating, Ventilation and Air Conditioning systems (HVAC). Some HVAC systems can filter out particulate matter from the air, but may be costly. Improperly maintained HVAC systems may be the source or contribute to the distribution of contaminants.	<ul style="list-style-type: none"> <input checked="" type="checkbox"/> Install mechanical ventilation where feasible. <input checked="" type="checkbox"/> Ensure mechanical ventilation systems are properly maintained (i.e. free of mould growth, filters are routinely changed, air vents are unobstructed, no standing water). <input checked="" type="checkbox"/> Combine opening windows with the use of portable fans as an inexpensive way to draw air into the classroom.

Outdoor Exposures		
Potential Concern	Why it is a Concern?	Action to reduce the concern.
Pressure Treated Wood	Existing playground equipment constructed from wood treated with chromated copper arsenate (CCA) requires specific mitigation measures. CCA contains arsenic, a known human carcinogen. Small amounts of CCA may leach from the wood and be ingested by children via frequent hand to mouth activity. CCA wood was phased out for residential and commercial use and has not been available since January 2004.	<ul style="list-style-type: none"> <input checked="" type="checkbox"/> CCA-treated wood playground structures should be coated with an oil-based penetrating sealant every one to two years. Sealant surfaces should be monitored for wear and to assess need for re-sealing. <input checked="" type="checkbox"/> Encourage hand washing after playing outdoors. <input checked="" type="checkbox"/> Regularly till or refresh sand/soil or other base material underneath play structures made of CCA-treated wood.
UV Radiation	Exposure to UV radiation may cause sunburns, which can increase risk of skin cancers later in life. UV radiation is strongest between 11am and 4pm from May through September.	<ul style="list-style-type: none"> <input checked="" type="checkbox"/> Provide adequate shade in areas of active play on school grounds <input checked="" type="checkbox"/> Encourage the use of hats and sunscreen by children and staff.
Diesel Exhaust	Diesel exhaust contains known carcinogens and large amounts of fine particulate matter (FPM). Air quality inside buses can be worse than inside buildings. Children may be exposed while travelling in school buses.	<ul style="list-style-type: none"> <input checked="" type="checkbox"/> Retrofit school buses with appropriate technologies that result in reduced emissions and FPM. <input checked="" type="checkbox"/> Ensure that there is regular ventilation of air inside buses
Outdoor Air Pollution	Outdoor air pollution including fine particulate matter, ground level ozone and VOCs have been associated with decreased lung function. Smog alerts indicate when outdoor air pollution is high.	<ul style="list-style-type: none"> <input checked="" type="checkbox"/> Moderate children's play or activities outdoors during smog and/or alerts. That is, reduce the intensity of activity and allow for frequent breaks, adequate water intake, access to shade. <input checked="" type="checkbox"/> Or, if <i>air conditioned space</i> is available, schedule vigorous

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		<p>exercise or play activities indoors during smog alerts.</p> <ul style="list-style-type: none"><input checked="" type="checkbox"/> Ensure that a no-idling policy is enforced around schools.<input checked="" type="checkbox"/> Reduce vehicle emissions around schools by encouraging families to participate in a Walking School Bus program, where two or more families travel to school together.