8.1.0 Indoor Environment Quality (IEQ) Investigation Procedure

THIS IS NOT AN EMERGENCY PROCEDURE.
IN THE EVENT OF AN EMERGENCY (ie, contaminated air)

If there is contamination of the environment which is reasonably believed to be a serious and immediate health hazard to the building occupants, then the Principal, or person in charge, shall assess the situation and follow the SSRCE Emergency Management Plans on evacuation. That plan will guide considerations including: whether the contaminant risks are inside and/or outside and if the occupants would be safer inside or outside; the supervision required during and after evacuation; special needs of any occupant; notifying emergency responders, regional office, supervisor, parents, regional office.

Objective

The objective is to provide a consistent, effective investigative response to indoor environment quality concerns. This will be done in compliance with legislation and to compliment the OH&S complaint procedure. The procedure is to specify responsibilities, sequence activities, define a concluding evaluative procedure, provide a perspective on indoor environment quality testing, but not detail investigation procedures.

Roles and Responsibilities

Employee or Student with the Concern

- ✓ Provide information relative to the IEQ concern to the Principal or Person-in-Charge (PIC). It is preferred the concern is in writing so that there is a clear understanding of the situation.
- ✓ It is important to have other investigations happening concurrently, by health care providers and by the individual themselves, to try to identify the etiology of health effects.

Principal or Person-in-Charge (PIC)

If at any stage the situation is resolved , then the only further action required of the PIC is to notify those involved at that point and record the situation and solution with all other records related to the situation.

The following are not necessarily done in the order listed:

- ✓ Communicate with building maintenance and custodial personnel any actions within their areas of responsibilities, which can be taken to address the situation.
- ✓ If required, submit maintenance work requests to address building conditions relating to situation.
- ✓ Begin to consult on the investigation with the Joint Occupational Health and Safety Committee or Representative (JOHSC). Depending on the severity of the situation, involve the JOHSC either at the next regular meeting or at a specially called meeting if required.
- ✓ Isolate and change location (if necessary) of activities to improve experienced IEQ. Decisions to cancel school shall be in accordance to SSRCE Policy 410, "School Closure Due to Inclement Weather or Unfit for Occupancy".
- ✓ Regularly communicate the situation with necessary school employees, not only those in the area of concern, but others in the building who may be observing the investigation or any corrective actions. Also consider other communication needs: parents, community, media, and consult with individuals in charge of Regional Office communication as needed.
- ✓ Document signs and symptoms relating to situation including: location, date, identification of key people involved and remedial action taken.
- ✓ Notify the Health and Safety Manager and/or Operations Managers (H&S/Ops Managers) including all records and documents relating to the situation.
- ✓ Notify the JOHSC of the existence of any inspection or test reports. Make the reports available to the JOHSC or any employee, upon request.
- ✓ Monitor, follow up, and record corrective action. Review the effectiveness of the corrective actions in consultation with the JOHSC and the individual.

Maintain a record of all IEQ related correspondence, surveys, minutes, and other notes relating to IEQ issues or complaints at the site.

Joint Occupational Health and Safety Committee/Representative

- ✓ Accept any employee concerns regarding IEQ concerns.
- ✓ Participate in the investigation, review of documentation, records and corrective action taken.
- ✓ Submit written recommendations as deemed necessary by the JOHSC to the Regional Executive Director, or designate.

Health and Safety Manager and/or Operations Managers

- ✓ Respond to the PIC.
- ✓ Confer with employee or student with the concern and investigate using the "Occupant Interview (Appendix A)". The Occupant Diary (Appendix B) may also be given to the individual.
- ✓ Arrange for a facilities inspection to be conducted by a competent person(s) with respect to the concern or recommendations. The inspection may to be accompanied by a JOHSC member.
- ✓ If an individual reports symptom(s) which they think are caused by the building, provide the form "Referral of Individual Relating IEQ to Symptoms" (Appendix C) to be completed and taken to their physician.
- ✓ A written report of any inspection to be distributed to the PIC.
- ✓ Initiate actions to address or refer recommendations in the inspection to other persons with authority to address the concern.

Person(s) with Authority to Address the Concern (PAAC)

- ✓ Accept, present alternatives, or refuse with the reasons in writing of any recommendations submitted by the JOHSC. This written response must be delivered to the JOHSC within 21 days of receiving the recommendations.
- ✓ Review the concern, the inspection, corrective action, and results and submit a written concluding evaluation to the PIC and the JOHSC. If the investigations and corrective actions do not establish the cause of concern, the situation may not be related to IEQ. All symptoms commonly attributed to IEQ problems may also be associated to other factors, and not necessarily due to indoor environment deficiencies and may require different solutions.[1]

[1] IEQ Backgrounder – Tools for Schools (*environmental Protection Agency, May 1995*) Page 4

Inspection by a Competent Person(s)

- ✓ An internal or external resource person shall be used.
- ✓ The nature of the concerns and conditions shall determine the necessary competencies of the any inspector.
- ✓ The nature of the investigation and procedures shall be determined by the person and the results of the investigation shall be submitted in writing to the PAAC.
- ✓ Detailed investigation procedures are not contained here, with the exception of the situation concerning mold.
- ✓ Mold: Visual Inspection means looking for indicators such as water stains, standing water, condensation, areas with poor air circulation, heating and ventilation systems. The attached Visual Inspection Checklist may be used.

Mold Remediation

If mold is found, it is usually best to clean it as quickly and safely as possible. When flooding or water damage occurs, appropriate floor restoration procedures should be commenced as quickly as possible (ideally within 24 hours of water damage occurring).

1. Eliminate and mitigate mold growth:
    a. Water Damage Clean up:
        i. Water Quality: damage can occur from three categories (not its color) of water:
            1. "Clean" water (from water lines, steam leaks, sink overflows, broken toilet tanks, melting ice, snow or rainwater);
            2. "Gray" water (from dishwashers, washing machines, some pits or toilet overflows containing urine);
            3. "Black" water (from broken water drain traps, flooding from outdoor sources, sewage lines containing sewage, water contaminated with human excreta, hospital waste, blood).
        ii. General Guidelines:
            1. Use controlled conditions to prevent dispersion of any contaminants to other areas in the building
            2. Isolate the area and use negative air pressure if necessary to draw clean air towards the work area.
            3. Remove debris and any wet material with care. Seal in bags or covered containers. Once outside, discard as normal construction waste. Clean all equipment used in clean up before removal.

4. Assume there is a hazard unless known otherwise. Wear personal protective equipment: eye protection, gloves, footwear, disposable coveralls, and respiratory protection.

iii. Clean-up Process:

1. Inspect the water damaged area for safety hazards to ensure there is no potential for electrical shock, toxic gas, or confined spaces.
2. Conduct an inspection of the structural components (walls, beams, ceiling, etc) to ensure secure and there is no risk of collapse.
3. Provide appropriate personal protective equipment, especially in dealing with gray or black water damage.
4. Isolate damaged area and put up signage and barriers. If necessary, move occupants away from area.
5. Locate the sources of water, eliminate and repair.
6. Remove equipment and furniture and seal the perimeter air handling units, exhaust systems and return air plenums.
7. Remove excess water with mops, pumps or wet vacuums.
8. Dry damaged materials using dehumidifiers, fans, heaters, and running HVAC systems to remove humid air.

b. Locate, eliminate and repair sources of water damage:

i. Indoor sources:

1. Fix plumbing leaks, drips or sweating pipes
2. Limit sources of indoor humidity, dehumidify air
3. Increase fresh air ventilation when outdoor air is not humid
4. Insulate areas where dampness or condensation occurs
5. Warm cold surfaces where condensation may occur

ii. Outdoor sources:

1. Maintain roof and gutter/downspout systems
2. Direct runoff away from foundation by grading, draintile, landscaping, etc
3. Prevent leakage around windows, doors, flashings, etc
4. Waterproof foundations

2. Mold Clean-up and Prevention: Caution must be taken when removing and cleaning up mold. Employees who perform the clean-up must have adequate training and experience and can quite easily clean up small areas of mold. Always use personal protective equipment including gloves, eye and respirator protection. There are actually very few molds that would produce enough toxins to be harmful to humans in the average workplace, but it is possible to have an allergic reaction or be exposed to unknown high levels. Molds from bird and bat droppings can cause serious health concerns and special precautions must be applied by specialists.
    a. General Guidelines:
        i. Identify moldy areas
        ii. Wear rubber gloves, respirator, eye protection and clothing that can be easily cleaned or discarded.
        iii. Open windows during clean-up. Anyone not involved in the clean-up should stay away. If possible, conduct clean-up during off-hours.
        iv. Remove any water with wet/dry vac or by mopping.
        v. Remove mold by cleaning or disposing of contaminated material.
        vi. Remove porous materials such as paper, ceiling tiles, carpet, rags, wallboard and wood.
        vii. Clean non-porous materials with usual detergent and scrubbing.
        viii. Follow cleaning procedures with products being used.
        ix. Rinse with clean water.
        x. Allow to dry thoroughly. Fans and dehumidifiers may help speed up the process.
        xi. Bag in sealed bag and dispose of any materials unable to clean. If possible, document or take photos of teaching materials being disposed. There are no special requirements for the disposal of moldy material.
        xii. Identify and eliminate the moisture source.
        xiii. Clean-up and prevention activities are finished when water or moisture problem is fixed, mold removal is complete, visible mold and moldy odors are not present, there are no noticeable signs of water damage or mold growth.
    b. Clean-up Methods:
        i. Level 1 (< 10 sq ft, such as ceiling tiles, small areas on walls)
            1. Remediation can be conducted by trained building custodial staff.
            2. Respiratory protection is recommended (eg N95 disposable respirator). Hand and eye protection should also be worn.

3. The work area should be unoccupied. Vacating adjacent work areas is not necessary but is recommended in the for infants, persons recovering from surgery, immune suppressed people, people with chronic inflammatory lung disease (asthma, hypersensitivity pneumonitis and severe allergies).
4. Containment of the work area is not necessary. Dust suppression methods, such as misting (not soaking) surfaces prior to cleaning are recommended.
5. The work area and areas used by staff for egress should be cleaned with normal cleaning procedures.
6. All areas should be left to dry and visibly free from any contamination and debris.

ii. Level 2 (10-30 sq ft, such as individual wallboard panels)
1. Remediation can be conducted by trained building custodial staff.
2. Respiratory protection is recommended (eg N95 disposable respirator). Hand and eye protection should also be worn.
3. The work area should be unoccupied. Vacating adjacent work areas is not necessary but is recommended for infants, persons recovering from surgery, immune suppressed people, people with chronic inflammatory lung disease (asthma, hypersensitivity pneumonitis and severe allergies).
4. The work area should be covered with plastic sheet(s) and sealed with tape before remediation, to contain dust/debris.
5. Dust suppression methods, such as misting (not soaking) surfaces prior to remediation are recommended.
6. Contaminated material that cannot be cleaned should be removed.
7. The work area and areas used by staff for egress should be HEPA vacuumed and cleaned with normal cleaning procedures.
8. All areas should be left to dry and visibly free from any contamination and debris.

iii. Level 3 (30-100 sq ft, such as several wallboard panels)
1. A health and safety professional with experience performing microbial investigations should be consulted to provide oversight in the remediation.
2. Personnel trained in handling of hazardous materials and equipped with respiratory protection (eg N95 disposable respirator). Hand and eye protection should also be worn.

3. The work area and areas directly adjacent should be covered with a plastic sheet(s) and taped before remediation, to contain dust/debris.
4. Seal ventilation ducts/grills in the work area and areas directly adjacent with plastic sheeting.
5. 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, persons recovering from surgery, immune suppressed people, people with chronic inflammatory lunch disease (asthma, hypersensitivity pneumonitis and severe allergies).
6. Dust suppression methods, such as misting (not soaking) surfaces prior to remediation are recommended.
7. Contaminated materials that cannot be cleaned should be removed.
8. The work area and areas used by staff for egress should be HEPA vacuumed and cleaned with normal cleaning procedures.
9. All areas should be left to dry and be visibly free from any contamination and debris.

iv. Level 4 (> 100 connected sq. ft in an area or if abatement procedures are expected to generate a lot of dust from abrasive cleaning or demolition of plaster walls, or if visible concentration is heavy, such as a blanket coverage as opposed to patchy).
    1. A health and safety professional with experience performing microbial investigations should be consulted to provide oversight in the remediation.
    2. Personnel trained in handling of hazardous materials and equipped with respiratory protection (eg, full-face respirators with HEPA cartridges), disposable protective clothing covering both head and shoes, and gloves.
    3. 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 HEPA filter to generate negative pressure, with airlocks and decontamination room.
    4. Vacating adjacent work areas is not necessary but is recommended for infants, persons recovering from surgery, immune suppressed people, people with chronic inflammatory lung disease (asthma, hypersensitivity pneumonitis and severe allergies).

5. Contaminated materials that cannot be cleaned should be removed. The exterior of the bags should be cleaned with a damp cloth and detergent or HEPA vacuumed in the decontamination chamber prior to removal.
6. The contained area and decontamination room should be HEPA vacuumed and cleaned with a damp cloth and/or mop with a detergent and be visibly clean prior to the removal from isolation barriers.
7. Air monitoring should be conducted prior to occupancy to determine if the area is fit to reoccupy.

v. Level 5 (Remediation of HVAC systems):
   1. Sub-level 1 (<10 sq ft)
      a. Follow Level 2, Steps 1, 2, 4, 5
      b. The HVAC system should be shut down prior to any remedial activities.
      c. 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 a sealed plastic bag.
      d. The work area and areas used by staff for egress should be HEPA vacuumed and cleaned with normal cleaning procedures.
      e. All areas should be left to dry and visibly free from any contamination and debris.
      f. 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.
   2. Sub-level 2 (>10 sq ft)
      a. Follow Level 3, Steps 1 and 2
      b. Follow Level 4, Step 2, 3, 6, 7, 8 if contamination is > 30 sq ft.

c. 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 or HEPA vacuumed prior to the removal from isolation barriers.
d. 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.

Indoor Environment Testing

Normal investigation procedures may include measurement of comfort levels (temperature and relative humidity), efficiency of air circulation (CO_2 levels). Testing for contaminants such as VOC's, microbes, formaldehyde, particulate levels, etc may not be useful in determining the cause of symptoms and should only be used following investigative procedures that include visual inspection of the site, assessment of mechanical equipment and the general operation and maintenance of the building. Testing may be used to reveal an unidentified contaminant, to confirm the existence of a specific suspected condition, or to verify that clean up procedures have been effective. Authorization for testing must be received from the PAAC.