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Introduction

Financial

Pre-Design

Design

Construction

Occupancy

Maintenance and
Operations

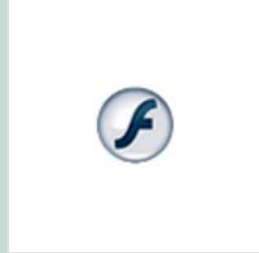
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CLASSROOM INDOOR AIR QUALITY

Issues and Suggested Responses

By Brian W. Smith

A. Introduction

Recently, several school districts in the Southern California region have faced claims that the air in their portable classrooms is unhealthy. If your school district receives a complaint or allegation that poor indoor air quality ("IAQ") in the classroom has led to illness in a student or staff member, it is important that you take the complaint seriously and that you promptly and appropriately respond in order to minimize parental anxiety regarding the safety of your classrooms.

Children of school age are still developing physically, and may be more likely than adults to suffer adverse effects as a result of poor IAQ. According to the American Lung Association, the incidence of asthma in children increased nearly fifty percent (50%) between 1982 and 1993. According to another report, asthma is the leading cause of school absences, accounting for twenty percent (20%) of lost school days. While no link has been established between these illnesses and classroom IAQ, the U.S. Government Accounting Office has stated that one in five schools in the United States has problems with indoor air quality ("IAQ") in its classrooms, and that California has more unsatisfactory environmental conditions in its classrooms than any other state.

The cost of responding to allegations of poor IAQ in classrooms, even if found to be untrue, has proven to be enormous, in terms of money that would otherwise be spent on educational programs, lost administrative time, and the adverse impact on relations between school district officials, teachers, staff, parents and students. To preclude such allegations, a school district should establish a preventive maintenance program, including changing of heating, ventilation and air-conditioning ("HVAC") filters and cleaning of classrooms on a regular basis. If a school district is subject to allegations of poor classroom IAQ, it should not underestimate the impact such allegations may have on the district, financially or otherwise, or quickly dismiss the effect such allegations may have on the district's relationships with the community.

The key to successfully addressing allegations of poor classroom IAQ is: (1) assemble a "team" with responsibility for addressing the allegations, including the district administrator(s), environmental consultant, public relations officer, and legal counsel; (2) develop a mechanism for open and honest communication with parents, students and the community, in order to maintain credibility; and (3) indicate a willingness to admit the existence of any problem that may be discovered and to take steps to immediately fix that problem, which will also help maintain the school district's credibility.

B. Sources of Poor IAQ

Many construction materials are composed of products that "off-gas" chemicals into the air, which are known as volatile organic compounds ("VOCs"). Such construction materials include carpet backing, wall coverings, particleboard used in cabinetry or finish work, and glues. Some furnishings also constitute a source of VOCs. Formaldehyde is a common VOC found to emanate from construction materials. The types of materials used in construction of portable classrooms are also typically used in construction of permanent facilities. Another common VOC is acetone, a common ingredient in markers and personal-care products, which are often used in the classroom. Other VOCs, alcohols, and other materials can enter the classroom if the school district is not careful to permit the use of only certain,

selected products in the classrooms. Benzene is a VOC of special concern because it is a human carcinogen. Benzene is used in gasoline and other vehicle fuels, and is released into the ambient (outside) air as a component of engine exhaust or as a result of evaporation of fuels. Although there are no sources of benzene in classrooms, benzene may be drawn into classrooms by the ventilation systems.

Some troublesome classroom contaminants are "natural" or biological in origin, rather than being introduced as part of the classroom structure. Biological contamination includes bacteria and fungi (molds). Fungi commonly found in classrooms include *Cladosporium*, *Alternaria*, and *Penicillium*. These fungi, by themselves, are not very harmful. However, any biological material may affect certain people and, over time, cause sensitization and allergic reactions. Thus, it is important to keep indoor levels of fungi lower than outdoor levels, by avoiding conditions leading to such fungal growth. Some fungi are "toxigenic," which means that they are capable of causing disease or reactions, either because they are inherently toxic or because they produce toxic chemicals in the body. These toxigenic fungi, including *Aspergillus*, *Chaetomium*, and the highly publicized *Stachybotrys*, are common outdoor fungi also, which may be transported into the classroom by normal human activity. It is easy to keep *Stachybotrys* from becoming a problem in classrooms simply by ensuring that water intrusion is not a problem. Mites, cat dander and other common allergens are also present in classrooms. Particulate matter can be a problem in classrooms in areas where housing or other construction is ongoing. Biological agents and particulate matter can be drawn into the classroom setting by ventilation systems, through open doors and windows, or carried in by students and others. Where ambient levels of air contaminants are present, a school district's primary option may be to improve ventilation filtration systems and the maintenance thereof.

Finally, carbon dioxide ("CO₂") may be a problem in classrooms with inadequate ventilation systems. CO₂ is produced by human bodies as a product of normal respiration. Exposure to CO₂ can result in drowsiness, eye irritation, and inability to concentrate. If a ventilation system provides inadequate fresh-air intake, levels of CO₂ in the classroom can rise dramatically during the course of a classroom session. The normal background level of CO₂ in ambient air typically ranges from 350 to 400 parts per million ("ppm"). The level in a classroom with poor ventilation may quickly rise to well over 700 to 800 ppm, the recommended upper limit for concentration of CO₂ in classrooms.

C. Causes of Poor IAQ

It is likely that most classroom IAQ problems can be traced to the HVAC systems. An inadequately sized or improperly adjusted ventilation system may lead to a shortage of fresh air transferred into the classroom or improper humidity levels. In addition, inadequate operation or maintenance of the HVAC systems may also lead to a shortage of fresh air transferred into the classroom, improper humidity levels, or a build-up of microbial contamination. Fungi have reportedly flourished near or on HVAC compressor coils, condensate collection trays, ductwork and other areas where moisture may be found.

Water intrusion or build-up in the classroom structure also plays a role in many cases of biological contamination. Water penetrating the building envelope may enter spaces above the ceiling or between the interior and exterior surfaces of walls, providing excellent breeding grounds for fungi. Water-stains on ceiling tiles, window openings, or along baseboards may indicate a water intrusion problem. Many classrooms have bathrooms, faucets, and drinking fountains, which may also become excellent breeding grounds for fungi if leaks are not repaired in a timely manner.

D. Possible Indicators of Poor IAQ

Some of the symptoms associated with poor classroom IAQ include eye, nose or throat irritation, discomfort, headaches, inability to concentrate or to assimilate information, drowsiness, and absenteeism. In addition, it has been reported that asthma may worsen as a result of poor classroom IAQ. It is important to note that many of these symptoms are also associated with colds, flu, or other viral infections. Symptoms may be more closely correlated with poor classroom IAQ in certain cases, such as where symptoms occur while students or staff occupy a particular classroom, but clear after they leave the classroom. Teachers and staff should watch for indications that students become drowsier than normal as the class period progresses. Likewise, a higher than normal number of absences or visits to the school nurse by students from a particular classroom could indicate poor IAQ in that classroom, as could the onset at the same time of similar symptoms in students or staff occupying a particular classroom.

E. Detecting and Avoiding IAQ Problems

Prevention is the best means of avoiding the problem of poor classroom IAQ and for avoiding the possibility of liability for such problems. Likewise, a review of the school district's classroom facilities, with an eye toward detecting possible sources of poor IAQ, is the best means of detecting such problems. Each school district should establish a procedure to evaluate and monitor HVAC systems, including a determination of whether there is sufficient fresh-air intake and air-flow in the classrooms. If not in place already, each school district should establish procedures for regular maintenance of HVAC and ventilation systems, including regular changing of regular filters, as well as procedures for documenting that regular maintenance. Such a regular maintenance program could be implemented in conjunction with an overall, district-wide program, such as the U.S. Environmental Protection Agency ("EPA") Tools for Schools program. Because teachers or staff may turn off fresh-air ventilation systems at times, in order to adjust the comfort level in the classroom, a school district should consider automating HVAC controls to ensure that the ventilation system is on at all times when the classroom is occupied.

School district maintenance personnel should be trained to evaluate and monitor school facilities for signs of water intrusion or accumulation. If a leak in the building envelope is detected, its early repair may prevent conditions likely to lead to fungal growth. Where moisture has entered a structure, the area should be immediately repaired and thoroughly dried. Certain measures may be taken inside classrooms where the possibility of water intrusion or damage exists, e.g., replace carpet with linoleum in areas around faucets,

drinking fountains and doorways.

As noted above, school district personnel should monitor student behavior in the classroom, as well as student and staff health complaints and visits to the school nurse.

F. Typical Problems in Responding to Alleged Poor IAQ

Most school district administrators and personnel are not experienced or trained in responding to IAQ issues; therefore, it is likely that the school district's response will be unstructured and ad hoc, and complaints may not be viewed as being a serious matter. This lack of experience or training in such matters may lead to a less than enthusiastic or timely response, in the hope that the issue will wither and die. However, as most school district administrators will realize, where the health and safety of children is at issue, strong emotions come into play. A school district may easily find that is being characterized as uncaring or as caring only about the bottom-line cost. Therefore, it is recommended that a school district respond in a forthright and timely manner to any allegations of poor classroom IAQ.

Whether one or more of a school district's classrooms actually suffer from poor IAQ, responding to such allegations can result in significant monetary impact on the district's budget, as most school districts do not have funds set aside or otherwise available for this purpose. If IAQ problems actually exist, budgetary restraints leading to deferred maintenance are likely a significant reason. The school district may be forced to redirect resources (funds, time and effort of staff and administration, relocation of students from affected classrooms) from areas needed in order to respond to IAQ issues. If litigated, the school district's liability insurer should cover the direct costs of litigation; however, insurance will not cover all of the costs and expenses incurred by the school district. In addition, a school district should anticipate in establishing preventive maintenance programs, depending on the scope of additional measures required, that it may incur a significant increase in maintenance costs and, where greater fresh-air intake requires additional heating and cooling, increased utilities costs.

A school district facing allegations of poor classroom IAQ may find that state and county health departments may provide only limited assistance in addressing these issues. Probably the main reason for this is that these organizations have limited experience in addressing allegations of poor classroom IAQ and no procedures set up for responding to such allegations. Several attempts at legislative solutions were made during this past session of the Legislature, however, none were successful. It is hoped that the recent exposures to these types of issues will make these state and local agencies more aware of the relevant issues and more responsive to school districts' requests for assistance.

As noted above, where there is a perceived threat to the health and well-being of their children, parents may be anxious or irate. In these types of situations, if the parents perceive the school district as attempting to dismiss their concerns, or as withholding relevant information, it will easily lead to mistrust of the school district. The emotional cost paid by school district personnel may be high, and the result may be a deterioration in the long-term relationships of district administrators, teachers, staff, parents, and students.

G. Important Considerations for Responding to Allegations of Poor IAQ

When a school district receives allegations that poor classroom IAQ has resulted in illness of a student, teacher or other person, the district should quickly assemble a team to respond to the issue, which should include a district administrator with responsibility for addressing the issue, a qualified technical consultant, a public information officer or spokesperson, and legal counsel. Someone, whether a district official or the district's technical consultant, should be designated as the one person who will coordinate all efforts to respond to the allegations.

The school district's consultants (environmental toxicologist and testing firms) should be employed by and through the district's legal counsel in order to permit review of environmental assessment reports prior to their becoming public records. All environmental testing results and other releases should be reviewed by the district's legal counsel, prior to public release, to avoid ill-advised statements by uninformed or mistaken consultants. To the extent possible, the school district may desire legal counsel to review all public announcements, news releases, and correspondence to assist in minimizing any controversy that may arise from their release. The environmental toxicologist will be one of the most important members, if not the most important member, of the school district's team. The environmental toxicologist has the responsibility of addressing all of the technical aspects of IAQ, but should also be a person who "presents well" to the community and to the parents, and engenders a certain level of trust in them.

A school district facing such allegations should contact its liability insurer as soon as possible, even if there have been no claims or litigation filed. If litigation appears imminent or likely, the school district's insurer may agree to cover some or all of the expenses incurred by the district in responding to allegations of poor IAQ, in order to preclude such litigation. The expense of litigating such issues would be tremendous, even in the event the school district ultimately prevails in court.

It is extremely important for the school district to develop mechanisms and procedures for communicating with parents and others in the community, such as posting of test results and significant correspondence on the district's website, community meetings, and contact with print and television news services. The school district should be as open and forthcoming with parents as possible in order to maintain credibility with them. In addition, given the nature of the controversy, it is likely that newspaper and television news services will be requesting information and interviews with district officials. The school district's public information officer or spokesperson will play an important role in choosing how to best present the district to the public.

If you have any questions, if you would like assistance in addressing IAQ issues, or if you would like a referral to a qualified environmental toxicologist, please contact Brian W. Smith, Wendy Wiles, or Alexander Bowie at Bowie, Arneson, Wiles & Giannone.

The applicability of the legal matters discussed may differ substantially in individual situations. The foregoing information has been prepared by Bowie, Arneson, Wiles & Giannone as an overview of the subjects discussed and should not be construed as individual legal advice.