

SICK BUILDING SYNDROME

AND

BUILDING-RELATED ILLNESS

by

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From

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AND ELECTROMAGNETIC FIELD ISSUES
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*The views expressed herein are the author's own and do not necessarily represent
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Sick Building Syndrome and Building-Related Illness

Previous chapters in these materials have focused on indoor air quality (“IAQ”) problems caused by contaminants such as asbestos, lead, radon and tobacco smoke, whose effect on human health is relatively well documented and which can be measured and analyzed in a relatively discreet and objective manner. With increasing frequency, building occupants are found to suffer from a wide variety of ailments apparently resulting from IAQ problems, but not traceable to a single specific contaminant. “Building Sickness”, once thought of by many as an imaginary illness, is now generally recognized as a valid health concern in its own right. The EPA has two different classifications for building sickness, sick building syndrome and building-related illness.¹ The two terms are sometimes used interchangeably.

Sick building syndrome (“SBS”), sometimes referred to as “tight-building” syndrome, is said to result when a substantial number of a building’s occupants experience medical symptoms from an unknown cause that are apparently linked to the time they spend in the building, but that subside when the occupants leave the building.² The occupants generally exhibit no specific illness or etiology but exhibit a wide variety of symptoms. These can include headache, fatigue, depression, anxiety, dry cough, eye, nose and throat irritation, skin irritation and respiratory problems.

SBS is difficult to identify and verify for a number of reasons. First, it can result from a number of different sources and causes. Analysis of air samples often fails to detect high concentrations of any specific contaminants. Second, air quality problems affect different people in different ways. IAQ problems that adversely affect the health of allergic or asthmatic individuals or individuals with respiratory disease, for example, may have no ill effect at all on individuals without these conditions. Third, the physical symptoms that result from SBS can result from many other causes as well (including the air quality in other buildings frequented by the person suffering the symptoms). The evidence that an individual has suffered ill effects from

SBS is often circumstantial. Also, it is believed that the symptoms of SBS can be caused not only by a building's air quality, but by other causes such as environmental stresses (e.g., uncomfortable temperature, poor lighting, and noise), ergonomic stresses and psychological factors.

In contrast to SBS, building-related illness ("BRI") is an illness brought on by exposure to a building's air, where symptoms of diagnosable illness are identified and can be directly attributed to environmental agents in the air.³ Legionnaire's disease and hypersensitivity pneumonitis are examples of BRI. While an SBS complainant can typically feel relief when he or she is not in the building, BRI complainants typically need a long time to recover or do not recover at all after leaving the building.⁴

Office buildings, generally thought of as safe places to work, are increasingly the subject of SBS and BRI complaints. It has been estimated that as many as 2 million of the 10 million commercial office buildings in the United States are "sick".⁵ Cases of SBS and BRI also frequently arise in private homes and other residential buildings where, due to long-standing exposure, the consequences can be the most severe.

The EPA has identified at least 1,000 indoor air pollutants, many of which have been identified as major health threats.⁶ Among the substances that are believed to be the greatest factors in SBS (in addition to the substances discussed in earlier chapters in these materials such as asbestos and lead) are: carbon monoxide, carbon dioxide, and other products of combustion; formaldehyde and other volatile organic compounds (which can result from combustion or from "off-gassing" of many building materials, furniture and furnishings); pesticides; biological contaminants such as bacteria, mold, fungi, viruses, and pollens; ozone; and particulates (for example, from cleaning sprays and aerosols). BRI is caused by biological contaminants.

There are a number of sources of these contaminants that can lead to unhealthy concentrations in office buildings, houses, and other buildings, including:

1. Microbiological growth in duct work, humidifiers, drip pans, cooling towers and other building components;

- 2) Emissions from pressed-wood furniture, carpeting, and other building equipment and furnishings;
- 3) Emissions from paint, caulk, adhesives, cleaning supplies and other products used in buildings;
- 4) Emissions from pollutants (such as vehicle exhaust) from outside of buildings;
- 5) Exhaust from buildings themselves that is drawn back into the buildings; and
- 6) Odors from persons in buildings, including cosmetic odor.

A properly designed and properly functioning heating, ventilation, and air-conditioning (“HVAC”) system should control the level of contaminants in a building through adequate exchange of air with the outside, through air cleaning and filtration and through proper air flow patterns within a building. Thus SBS and BRI frequently are diagnosed in occupants of buildings with inadequate or improperly functioning HVAC systems.

Following the energy crises in the 1970’s, many buildings were designed to be relatively air-tight and thus energy efficient. Unfortunately, “tight” buildings often have indoor air quality problems, including incidence of SBS and BRI, for two reasons: first, contaminants cannot escape from the building; and second, the lack of ventilation increases moisture and encourages the growth of micro-organisms.⁷ The increasing use of synthetic building materials and furnishings, chemically based cleaning materials, pesticides, and personal care products over the last several decades has also apparently exacerbated the problem.⁸

I. Federal Laws and Regulations

As discussed in earlier chapters of these materials, there are a number of federal statutes that have been enacted regarding specific indoor air contaminants such as asbestos⁹ and radon.¹⁰ However, there are no federal statutes or regulations setting minimum acceptable levels in office buildings or residences for most of the substances associated with SBS and BRI or that otherwise address SBS and BRI in a meaningful way.¹¹ The Clean Air Act¹² was arguably not intended to regulate indoor air quality and has generally not been applied to indoor air.¹³ The Occupational

Safety and Health Act, 29 U.S.C. Sections 651-667 also has not been applied to regulate indoor air quality in most residential, educational, and workplace environments.¹⁴ The Comprehensive Environmental Response Compensation and Liability Act ("CERCLA")¹⁵ has generally been held inapplicable to the removal of building materials such as asbestos that contaminate indoor air,¹⁶ although CERCLA has been successfully invoked to require remediation of indoor air problems in a few unusual cases.¹⁷

Proposed federal legislation addressing indoor air quality has been introduced in Congress during each of the last several years, but has yet to be enacted. Senate Bill 656 passed in the U.S. Senate on October 29, 1993 and has been sent to the House of Representatives. A similar bill introduced in the House of Representatives, H.R. 1930, has not yet been voted on. Perhaps the most notable aspect of these bills is what they do not contain: any mandatory standards for air quality or ventilation in buildings. Earlier versions of the House bill would have established minimum ventilation standards in new and substantially renovated buildings and would have authorized the Secretary of Labor to issue standards on workplace indoor air quality (including exposure limits),¹⁸ but these controversial provisions were dropped to enhance chances for passage.¹⁹ The current Senate and House bills now more closely mirror a less controversial Senate bill that actually passed the Senate on two separate occasions, most recently in 1991, but were never voted on by the House. The current Senate bill, entitled the "Indoor Air Quality Act of 1993" would not establish any additional authority for regulating indoor air quality but rather would require the EPA to develop a "national indoor air quality response plan" consisting of response actions to be implemented under the authority of existing statutes such as the Clean Air Act and the Toxic Substances Control Act. The plan would include development of model building codes and guidance documents, among other things. The bill goes somewhat further for Federal buildings (defined to include privately owned buildings leased to Federal agencies), requiring both general and building-specific response plans to cover building management practices, personnel training programs and other actions to reduce exposure to indoor air contaminants. Specific response actions would be required in Federal buildings with known IAQ

problems. Section 11 of the bill would require the Director of the National Institute For Occupational Safety and Health to implement a Building Assessment Demonstration Program, under which IAQ assessments would be performed for specific buildings, including privately owned buildings, selected from proposals submitted by building owners or occupants. The assessments would identify appropriate response measures and would be made available to a building's owners and occupants. Although the bill does not specifically obligate the owner to implement the recommendations of an assessment, failure to do so could arguably expose the owner to private party claims. In addition, the bill also provides for research and development, demonstration activities, training courses, publication of health advisories and other information, and grants. The bill also would establish an Office of Radiation and Indoor Air within the EPA and an inter-agency Council on Indoor Air Quality.

On March 25, 1994, Labor Secretary Reich introduced a long-awaited proposed rule under OSHA for regulating indoor air quality in non-industrial workplaces (defined as including offices, educational facilities, commercial establishments, health care facilities, and offices, cafeterias, and breakrooms in manufacturing facilities).²⁰ The proposed rule would impose a myriad of requirements on "employers", defined to include in some cases building owners and lessees.²¹ According to OSHA Administrator John A. Dear, the publication of a final rule, following several public hearings and a comment period, is likely to take several years.²²

The provisions of the proposed OSHA rule that would regulate tobacco smoke in the workplace are previously discussed in these materials. The general indoor air quality provisions in the proposed rule would, among other things, require an employer to establish a written indoor air quality compliance program, to keep written records on indoor air quality complaints, to maintain inspection and maintenance records, to designate an individual to have specific responsibility for the indoor air quality compliance program, and to provide training for certain employees whose functions impact on indoor air quality. The proposed rule also includes fairly comprehensive and specific requirements for maintenance and operation of HVAC systems, including requirements to maintain an outside air ventilation rate no less than that required by codes in effect when the facility

was most recently constructed, renovated or remodeled, to operate the HVAC system during all work shifts, to monitor carbon dioxide levels, and to use exhaust ventilation when housekeeping and maintenance activities can reasonably be expected to result in hazardous chemical or particulate exposure to other employees. There are also specific requirements in the proposed rule regarding prevention of contamination from outside air, prevention of microbial contamination, use of chemicals and pesticides in the workplace, and maintenance of air quality during renovation and remodeling.

II. State Laws and Regulations

Laws and regulations addressing indoor air quality have been enacted in only a handful of states. Many of these laws and regulations apply to public building only. Some of the state laws and regulations are described below.

A law enacted in the State of Washington in 1990 sets forth detailed requirements for newly constructed residential buildings including requirements for ventilation, formaldehyde emissions, and combustion appliances.²³ The statute also provides that it shall be a defense in any civil action against a builder or design professional for damages for injury caused by indoor air pollutants that the builder or design professional complied in good faith, without negligence or misconduct, with the ventilation requirements and certain other requirements.²⁴

New Jersey has established detailed regulations for resolving indoor air complaints in public buildings.²⁵ The regulations adopt the standards of the American Society of Heating, Refrigerating and Air Conditioning Engineers (“ASHRAE”)²⁶ as the official standard for evaluating indoor air quality in buildings occupied by public employees (including privately owned buildings leased to government agencies) and provides that a building owner can be required, where indoor air quality deficiencies are found after a complaint is filed, to retrofit the building to conform to the ASHRAE standards.

A statute in Maine²⁷ also refers to the ASHRAE standards, requiring that those standards, or more stringent standards, be applied to buildings constructed or substantially renovated by the

State after a specified date and to buildings in which the State leases space under leases entered into or renewed after a specified date.

There are also indoor air statutes in Minnesota²⁸ and Oregon.²⁹ In addition, various state and local building codes also attempt to address indoor air quality problems.

Indoor air quality bills are pending in a number of states.³⁰

III. Voluntary Guidelines and Standards

There are a number of voluntary standards and guidelines that have been developed, both by industry and government, in order to assist building owners, managers, contractors, and architects in preventing and remediating indoor air quality problems that can result in SBS and BRI.

The most significant government publication on the issue of indoor air quality is an EPA publication called “Building Air Quality: A Guide For Building Owners and Facility Managers”³¹ (hereinafter called the “EPA Guide”). This publication is increasingly viewed as the state-of-the-art guide to preventing and resolving indoor air quality problems. Among other things, the EPA Guide recommends that a building’s owners and operators develop an “IAQ profile” and “IAQ management plan” for the building, that they designate an “IAQ coordinator” for the building, that they establish procedures for operation and maintenance of the building’s HVAC system, that they develop a mechanism for cooperation and communication with building occupants, that they conduct a training program for operations and maintenance personnel, and that they set forth recommended procedures for investigating and responding to indoor air quality complaints.

The EPA recently initiated a voluntary program, called the “Building Air Quality Alliance”, under which building owners and operators would voluntarily agree to implement policies designed to help ensure satisfactory air quality in commercial buildings. In developing the program, the EPA is consulting with both the private sector and other government agencies. The policies that will be recommended under the program will likely be based in large part on those

recommended in the EPA Guide. The organizational meeting for the program took place on February 22, 1994. The EPA intends to have the program in effect by late 1994.

Probably the most notable industry standard on indoor air quality is Standard 62-1989 of the American Society of Heating, Refrigerating and Air Conditioning Engineers (“ASHRAE”), entitled “Ventilation for Acceptable Indoor Air Quality” which specifies minimum ventilation rates and indoor air quality standards for indoor spaces. The Standard provides that acceptable indoor air quality may be obtained through one of two methods, adequate ventilation or direct control of known and specifiable contaminants.

The ventilation method requires minimum volumes for intake of outdoor air, ranging from 15 cubic feet per minute per person for areas such as hotel lobbies and office reception areas to 60 cubic feet per minute per person for smoking lounges. For office space, 20 cubic feet per minute per person is called for. Greater ventilation may be required depending on occupancy characteristics and other factors. When the outside air does not satisfy quality standards, filtration of the outside air is also required.

The alternative method under Standard 62-1989, which provides for direct control of contaminants, incorporates both specific maximum levels for certain contaminants and subjective evaluations for other contaminants. The purpose of the alternative method, as explained in the foreword to the Standard, is to permit an engineer to design a system that conserves energy through less outside air exchange so long as air quality is not compromised. However, this option is rarely used because information regarding contaminant emissions from building materials and equipment is generally unavailable and an architect or engineer who designs a building intending to use the direct control option cannot know for certain until the building is up and running whether or not the design has succeeded in complying with the Standard. (In contrast, proper design of a building can virtually assure successful compliance with the Standard’s ventilation option). Also, the partly subjective nature of the direct control option may make it difficult in any event to prove compliance with the option.³²

Standard 62-1989 also sets forth design and maintenance requirements for certain buildings systems and equipment such as fuel burning appliances and ventilating ducts and plenums.

As noted above, New Jersey's and Maine's indoor air quality regulations incorporate ASHRAE Standard 62-1989. Various pending state bills would also establish ventilation standards based on or modeled after ASHRAE Standard 62-1989.³³

Even when not incorporated into law, generally recognized standards and guidelines on indoor air quality, such as those described above, arguably establish standards of care to which buildings owners and others will be held. One commentator, in discussing ASHRAE Standard 62-1989, expressed the view that:

“Compliance with ASHRAE Standard 62-1989 probably provides the best indoor air standards now available for defending IAQ standards. The standard offers important industry-wide guidance and supports claims of ‘Good Engineering Practices’ in an area rampant with unknown factors and a range of uncertainties. Owners and design professionals have a precise way to demonstrate that ‘normal and customary’, procedures were used.”³⁴

IV. Common Law

Because there are few federal or state statutes imposing requirements on owners with regard to indoor air quality and the prevention of SBS and BRI (other than those regulating certain specific contaminants such as asbestos and radon, as described in earlier chapters of these materials), the only significant legal battles concerning SBS and BRI have involved common law claims. “Creative use of the common law ‘regulates’ indoor air quality by threat of suit.”³⁵

Thousands of lawsuits have been filed for damages allegedly resulting from exposure to indoor air contaminated with asbestos and formaldehyde.³⁶ The number of suits alleging SBS and

BRI is much smaller³⁷, probably because the causes of and long-term health effects of SBS and BRI are not yet completely understood and individual cases are therefore difficult to prove in many instances. However, such actions are by no means novel and are likely to become more commonplace.

There are few reported cases in which a building's owners have been sued for damages or injuries allegedly caused by SBS or BRI. In Bloomquist v. Wapello County,³⁸ the Iowa Supreme Court reinstated a jury verdict in favor of state employees who claimed that they suffered respiratory, immunological and neurological injuries from pesticide sprayed in a building with a faulty HVAC system. The court held that epidemiological evidence proving that the pesticide had caused the injuries was not required in order for the plaintiffs to prove causation.

A number of other well-publicized cases have been settled. For example, in Call v. Prudential Insurance Company of America,³⁹ two building tenants and a number of their employees sued the building's owner, architects, contractors, and various subcontractors for damages allegedly resulting from indoor air quality problems. The plaintiffs alleged that the indoor air was contaminated by fumes from new carpeting, furniture and paint in a portion of the building still under construction and that a faulty and inadequate HVAC system failed to properly dilute the contaminants with outside air. The employees sought damages for health problems and the tenants sought damages for business interruption and loss of productivity. The case was settled for an undisclosed amount one month into the trial.

Another case that was settled, Shaddock v. Douglas Emmett and Co.,⁴⁰ was an action by a building occupant against the building's owner, leasing agent, architects, contractors and maintenance personnel for negligence. The plaintiff alleged that a poorly constructed and maintained HVAC system resulted in upper respiratory infections, coughing, eye and throat irritation and headaches.

Since SBS and BRI can be due to a number of factors and since it is often unclear who is responsible for SBS and BRI problems, an alleged victim will often sue a number of parties

including the building owner, the building manager, the developer, former owners and managers, the contractors and other builders, the architect, the engineers, the leasing broker, and the manufacturers, wholesalers and distributors of building equipment, furniture, and furnishings believed to be a cause of the problem. Claims by employees against their employers are generally governed by workmens' compensation laws.

Claims against building owners can be based on a number of different common law theories. An owner can be liable for negligence if it fails to comply with its common law duty to tenants and others to whom it owes a duty (such as the tenant's employees and invitees) to maintain the property in a reasonably safe condition. A claim by a tenant can also be based, depending on state law and on the nature of the claim, on breach of lease, breach of the implied warranty of liability, breach of the right of quiet enjoyment, fraudulent or negligent misrepresentation, or constructive eviction. A purchaser of property with indoor air quality problems may have claims against the seller based on similar theories such as breach of the contract of sale, breach of express or implied warranty, or fraudulent or negligent misrepresentation. An injured individual may also have a claim against a building owner based on theories such as assault, battery, or intentional infliction of emotional distress.

Potential recoveries include compensation for physical injury, property damage (including reduced market value of a building), economic loss, increased risk or fear of cancer and other disease, emotional distress, and the cost of future medical surveillance. A tenant may seek rent abatement, the right to terminate its lease, and other damages (such as for loss of productivity).

V. Suggestions for Building Owners

As with most environmental problems, a real estate investor's best protection against SBS and BRI problems is not to acquire the building with the problem in the first place. There are a number of ways that an investor can investigate the potential of air quality problems in a building prior to acquiring the building. First, the investor can assure itself, through a review of the plans and specifications and/or an engineering inspection, that the building has adequate ventilation and

complies, at minimum, with the ventilation standards and other requirements of ASHRAE Standard 62-1989. The investor can require representations and warranties, and perhaps indemnities, from the seller regarding ventilation and building materials and, if the building is already up and running, regarding the absence of indoor air complaints from tenants and other occupants. A diligent investor can also require air testing as part of its pre-acquisition Phase 1 environmental assessment, although air-testing is not typically part of a Phase 1 assessment⁴¹ and, because of the large number of contaminants that can contribute to SBS and BRI, could be rather expensive.

A building owner should make sure that its leases do not contain covenants regarding air quality (such as covenants establishing ventilation requirements and permitted temperature and humidity ranges) that the owner is not certain that it can satisfy. If the tenant is to have certain responsibilities for maintenance of the HVAC system, this should be specified in the lease. Also, the lease should make it clear that the tenant, and not the landlord, is responsible for air quality problems caused by or contributed to by the tenant (for example, vents blocked by the tenant, over-occupancy of the space, and off-gassing from the tenant's furniture and furnishings).

The best protection for a current building owner against claims alleging SBS and BRI is to act in accordance with the best available engineering standards and customs to prevent and, if necessary, promptly remediate, any sick building problems. Unfortunately, as noted above, the causes of SBS and BRI are not fully understood and therefore even the most diligent owner does not always know the most effective way to respond to SBS and BRI problems. However, simple operations and maintenance procedures such as cleaning filters and ducts on a regular basis, conducting periodic inspections, and proper use and storage of cleaning supplies and pesticides can prevent the occurrence of many indoor air quality problems. Prompt and diligent investigation of complaints is also important. At minimum the owner should follow the standards and recommendations in industry and government guides and publications such as ASHRAE Standard 62-1989 and the EPA's publication "Building Air Quality - A Guide for Building Owners and Facility Managers."⁴²

An owner can implement a formal indoor air quality management plan (as recommended by the EPA)⁴³ setting forth policies not only on operations and maintenance, but also on investigation of complaints, training and education of personnel, communication with tenants and occupants, and other matters. Such a management plan not only may prevent many indoor air quality problems but also can be used to demonstrate that an owner is acting reasonably to prevent such problems and thus should not be held liable for problems that occur despite its efforts. An owner's policies and management plan regarding indoor air quality should be incorporated in any building management contract.

¹ U.S. Environmental Protection Agency, Building Air Quality: A Guide for Building Owners and Facility Managers, (EPA/400/1-91/033, DHHS (NIOSH) Publication No. 91-114, December 1991).

² Steven A. Loewy, George W. Kelly, and Martha D. Nathanson, “Indoor Pollution in Commercial Buildings” Legal Requirements and Emerging Trends, 11 Temp. Envtl. L & Tech. J. 239 at 4 (1992).

³ Andrew J. Harrison, Jr., “An Analysis of the Health Effects, Economic Consequences and Legal Implications of Human Exposure to Indoor Air Pollutants.” 37 S.D.L. Rev. 289, at 10 (1992).

⁴ Supra, note 1.

⁵ Subcommittee on Health and the Environment House Committee on Energy and Commerce, April 10, 1991; testimony on the Indoor Air Quality Act of 1991.

⁶ Steve Kelly, “Indoor Air Pollution: An Impetus for Environmental Regulations Indoors?”, 6 BYU J. Pub. L. 295 (1992).

⁷ Laurence S. Kirsch, “The Status of Indoor Air Pollution Litigation”, C 432 ALI-ABA 317 at 1 (1989).

⁸ U.S. Environmental Protection Agency, Targeting Indoor Air Pollution: EPA’s Approach and Progress (EPA 400 R 92-012 March, 1993).

⁹ For example, the Asbestos Hazard Emergency Response Act, 15 U.S.C. Sections 2641-2656 (1988).

¹⁰ For example, the Indoor Radon Abatement Act of 1988, 15. U.S.C. Sections 2661-2671.

¹¹ Statutes that regulate or that grant the authority to regulate the manufacture and distribution of some of the products that can cause SBS and BRI, such as the Toxic Substances Control Act, 15 U.S.C. 2601-2654, the Federal Insecticide, Fungicide, and Rodenticide Act, 7 U.S.C. 136-136y, and the Consumer Product Safety Act, 15 U.S.C. Sections 2051-2083 are outside the scope of these materials.

¹² 42 U.S.C. Sections 7401-7642.

¹³ Supra, note 9 at 13.

¹⁴ Supra, note 3 at 22.

¹⁵ 42 U.S.C. Sections 9601-9675.

¹⁶ See, for example, Steven Creek Associates v. Barclays Bank of California, 915 F. 2d. 1355 (9th Cir. 1990), cert. denied 111 S. Ct. 2014 (1991).

¹⁷ In T&E Industries v. Safety Light Corporation, 680 F. Supp. 696 (D.N.J. 1988), a company that had dumped radioactive waste on a site that was causing high levels of radon in a building subsequently built on the site, was held liable under CERCLA to remediate the site. In Vermont v. Staco, Inc., 684 F. Supp. 822 (D. Vt. 1988), the court held that a company that produced mercury thermometers and whose employees carried mercury on their bodies and clothing from the factory to their homes resulting in high mercury levels in the air inside their homes was responsible for remediation under CERCLA.

¹⁸ Supra, note 2 at 6.

¹⁹ BNA Daily News, BNA Washington Insider, March 10, 1993.

²⁰ “Regulatory Text for OSHA Proposed Rule Covering Indoor Air Quality, Workplace Smoking”, BNA Daily Labor Report No. 58 (March 28, 1994)

²¹ Paragraph (b) of the proposed rule defines employer as “all persons defined as employers by Sec. 3(5) of the Occupational Safety and Health Act of 1970 including employers (such as building owners or lessees) who control the ventilation or maintenance of premises where employees of other employers work.”

²² Id.

²³ R.C.W.A. Section 19.7.190.

²⁴ R.C.W.A. Section 4.24.560.

²⁵ 24 N.J.R. 232.

²⁶ See discussion of ASHRAE Standard 62-1989 in part III of this chapter.

²⁷ 5 M.R.S.A. Section 1742(24).

²⁸ M.S.A. Section 144.495.

²⁹ Oregon Revised Statutes, Sections 433.521, 455.445, and 468A.775.

³⁰ For example, 1993 Illinois House Bill 2140 and 1993 New York Senate Bill No. 4594.

³¹ Id. at 1.

³² Francis J. Offerman, III, “Ventilation Standard Was Misunderstood”, 6 Indoor Pollution Law Report 4, September, 1992, page 3.

³³ New York Senate Bill No. 2405 (1993); Illinois House Bill 2057 (1993).

³⁴ Shirley J. Hansen, “New Ventilation Standard is Useful, But Limited”, 6 Indoor Pollution Law Report 2, July, 1992, page 1.

³⁵ Supra, 1 Note 8.

³⁶ Mary Rose Kornreich, “Minimizing Liability for Indoor Air Pollution”, 4 Tul. Envtl. L. J. 61 (1990).

³⁷ C. Jaye Berger, “Analyzing Causes of Action, Defense Factors in SBS Suits”, 6 Indoor Pollution Law Report 1, June, 1992, page 1.

³⁸ 500 N.W. 2d 1 (Iowa 1993).

³⁹ No. SWC 80813 (Cal., Los Angeles Super. Ct. October 1990).

⁴⁰ No. WEC 136229 (Cal., Los Angeles County Super. Ct. May 1989).

⁴¹ For example, ASTM’s Standard E1527, Standard Practice for Environmental Site Assessments: Phase I Environmental Site Assessment Process does not call for the testing of indoor air quality.

⁴² Supra, note 1.

⁴³ “Building Air Quality - A Guide For Building Owners and Facility Managers” supra note 1.