

## BUILDING AIR QUALITY ALLIANCE PROGRAM FOR BUILDING MANAGEMENT

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### ABSTRACT

Indoor air quality (IAQ) has emerged as a major concern for building owners, managers, engineers and tenants. As the public recognizes the importance of healthy, comfortable, and productive indoor environments, their awareness and demand for good IAQ increases. EPA studies rank indoor air pollution among the top five risks of environmental threats to public health. Guidance on achieving acceptable air quality and on preventing indoor air pollution is available. The 1991 EPA/NIOSH guide, *Building Air Quality: A Guide for Building Owners and Facility Managers*, has been widely accepted as a state-of-the-art guide to indoor air management. To promote the use of these straightforward guidelines, the EPA and other leaders in the IAQ field developed a voluntary program based on the principles outlined in the *Building Air Quality* guide. Government funding to promote and operate the program was eliminated due to budgetary constraints although the program had gained widespread support. The University City Science Center, a private non-profit institution, has introduced a private sector Building Air Quality Alliance closely patterned after the EPA program. This paper outlines these programs.

The guiding principals of the Alliance program include: 1) Make IAQ a Priority – establish good health, open communications, and mutual respect as priorities 2) Know How to Prevent Pollution - ensure building staff are knowledgeable, 3) Practice Good IAQ Management, 4) Fix Things That Go Wrong – establish effective problem-resolution procedures and act to solve problems promptly, 5) Communicate with Building Occupants. The Alliance action plan includes specific management practices including; Step 1) Designate an IAQ Manager, Step 2) Develop an IAQ Profile of the Building, Step 3) Address Existing and Potential IAQ Problems, Step 4) Educate Building Personnel About IAQ, Step 5) Develop and Implement a Plan for Facility Operations and Maintenance, Step 6) Manage Potential Indoor Pollutant Sources, Step 7) Communicate with Tenants and Occupants, Step 8) Establish Procedures for Responding to IAQ Complaints.

### INTRODUCTION

The quality of the air we breathe is important to our comfort, health and even our productivity. Since the advent of air conditioning and closed buildings, we have less control of our environment. People spend about 90 percent of their time indoors and air within homes and other buildings can be more polluted than the outdoor air. This is true especially in the largest and most industrialized cities. Environmental Protection Agency (EPA) studies that compare risks of environmental threats to public health consistently rank indoor air pollution (including secondhand smoke, radon, organic compounds, and biological pollutants) among the top five.

In 1991 the EPA and the National Institute for Occupational Safety and Health (NIOSH) along with many contributing organizations produced a guide for management of indoor air quality, *Building Air Quality: A Guide for Building Owners and Facility Managers* (the *Building Air Quality* guide) This manual has been widely applauded as the state-of-the-art guide to good indoor air management. Despite *Building Air Quality's* wide availability, EPA and other organizations continue to learn of indoor air problems that could be easily prevented or fixed by implementing recommended management practices based on common sense.

To promote the use of these straightforward practices to improve IAQ, the EPA and other leaders in the IAQ field developed a voluntary program based on the principles outlined in the *Building Air Quality* guide. Government funding to promote and operate the program was eliminated due to budgetary constraints although the program had gained widespread support among many building owners, managers, and trade groups.

Rather than abandon a good program, the University City Science Center (UCSC), a private, non profit institution in Philadelphia, has introduced a private sector Building Air Quality Alliance program closely patterned after the EPA program. The Alliance will provide opportunities and incentives to building owners and managers to

improve and maintain management practices and their bottom line.

The Building Air Quality program is based on a set of guiding principles derived from the *Building Air Quality* guide. Since understanding the *Building Air Quality* guide is essential to providing a building air quality program, it should be used as the starting point for program development. The Alliance provides a Manual that contains an Action Plan, which outlines the IAQ practices required.

### WHAT IS THE BUILDING AIR QUALITY ALLIANCE PROGRAM?

The Building Air Quality Alliance Program is a voluntary partnership program to promote good IAQ management practices in buildings. Partnerships among various entities can more readily achieve substantial results in improving IAQ in buildings than by acting independently.

Building owners and managers benefit in several ways when they develop good IAQ programs. By implementing the Action Plan, they increase the likelihood of good IAQ. This, in turn, can result in enhanced health and productivity of building occupants, increased energy efficiency, reduced cleaning costs, and lower equipment repair and replacement costs.

This paper describes the action plan for the program including details for the specific roles and responsibilities and the benefits of participating in a good IAQ program. The programs described in this document are intended to evolve over time to reflect new knowledge and expertise in the rapidly developing field of IAQ. As new technology is developed and new methods are accepted, the programs can be refined to reflect these developments.

### GOALS, BENEFIT AND GUIDING PRINCIPALS

The goal of the building air quality program is to achieve substantive improvement in IAQ in commercial, institutional, and public buildings by providing guidance and incentives to implement good IAQ management practices. Through this process, the growing demand for good IAQ can provide opportunities to enhance marketability and operational efficiency.

It is clear that even the diligent implementation of prescribed indoor air management practices cannot always ensure acceptable indoor air environments. Nonetheless, a proactive IAQ management strategy

can, in many cases, significantly improve IAQ.

The guiding principles of a good IAQ Program are:

- **Make IAQ a Priority**-establish good health, open communication, and mutual respect as priorities for building staff and occupants.
- **Know How to Prevent Pollution**-ensure building staff are knowledgeable about current IAQ practices and share new IAQ information with occupants and building staff.
- **Practice Good IAQ Management**-prevent IAQ problems by implementing good IAQ management practices.
- **Fix Things That Go Wrong** -establish effective problem-resolution procedures and act to solve problems promptly
- **Communicate with Building Occupants**-communicate with occupants about how they can be part of an effective IAQ management strategy

### ACTION PLAN

An Action Plan includes the specific IAQ management practices derived from the *Building Air Quality* guide. As explained later in this Manual, the Action Plan directs the participants to:

- Step 1 Designate an IAQ Manager**
- Step 2 Develop an IAQ Profile of Your Building**
  - Identify and review existing records
  - Conduct a walkthrough to assess current IAQ situation
- Step 3 Address Existing and Potential IAQ Problem**
- Step 4 Educate Building Personnel about IAQ**
- Step 5 Develop and Implement a Plan for Facility Operations and Maintenance**
- Step 6 Manage Potential Indoor Pollutant Sources, including but not limited to**
  - Remodeling and renovation
  - Mechanical System Hygiene
  - Housekeeping
  - Pest Control
  - Shipping and receiving

**Step 7 Communicate with Tenants and Occupants about Their Role in Maintaining Good IAQ**

**Step 8 Establish Procedures for Responding to IAQ Complaints**

**WHY IMPROVE IAQ MANAGEMENT PRACTICES?**

Improving IAQ management practices can generate many tangible results. Building owners and managers can increase building efficiency and profitability while occupants and tenants can enjoy a healthy, comfortable, and productive workplace.

**Better IAQ Improves Profitability.**

A building that is operating properly with respect to IAQ is likely to pay dividends of many kinds to buildings. Building owners may benefit from lower equipment repair and replacement costs, improved equipment operating efficiencies, and reduced risks of encountering IAQ problems requiring expensive mitigation and possible litigation. Building owners and managers may need to make an initial investment to train staff, profile a building, and fix problems discovered during the profile, and institute sound operational and maintenance procedures. The payback, however, from the higher levels of performance and reduced risk of liability should be well worth the initial investment.

Publicity about indoor air quality problems in both the popular press and the trade press is raising tenant awareness and increasing their expectations for improved building performance. For example, a Building Owners and Managers Association (BOMA) survey of building tenants ranks the twenty issues that tenants consider their biggest concerns. Tenants ranked cleaning services fifth, IAQ problems fourth, and heating, ventilation, and air-conditioning (HVAC) problems first. Similarly, out of the top ten complaints of building tenants, the International Facility Managers Association (IFMA) ranks poor janitorial services fifth, IAQ problems fourth, and thermal comfort problems associated with HVAC performance first and second. All the aforementioned issues are interrelated in many cases.

Building managers who perform well in HVAC and housekeeping services, and who adopt other IAQ sensitive practices outlined in the Action Plan, should be better equipped to attract tenants and keep tenants satisfied.

Facts to keep in mind:

- Good HVAC maintenance means improved energy efficiency. For example, the second stage for building owners implementing EPA's Energy Star Building Program' for HVAC systems is to profile the system, tune-up and balance the system, and institute a preventive maintenance program.
- Once IAQ problems occur, the cost of services to diagnose and mitigate these problems can be substantial, ranging from several hundred to several thousand dollars for each service rendered. IAQ diagnostic services may involve ventilation system evaluation, pollutant source characterization, pollutant measurements, and occupant health status determinations.
- Comprehensive pollutant source management can improve indoor air quality and reduce housekeeping and maintenance costs.

**Good IAQ enhances occupant health, comfort, and productivity**

Tenants and occupants in buildings with good IAQ also benefit from the reduced potential for adverse health effects from indoor air quality, as well as improved comfort and productivity. Poor IAQ can cause a variety of health problems, including headaches; eye, nose, and throat irritation; dry cough; dry or itchy skin; dizziness and nausea; difficulty in concentrating; fatigue; and sensitivity to odor. It is often difficult to know whether poor IAQ or other factors cause these symptoms. However, in some cases poor IAQ can be directly linked with specific illnesses, including hypersensitivity pneumonitis, Legionnaire's disease, or carbon monoxide poisoning. By implementing good management and operating practices, Building Partners reduce the likelihood and severity of IAQ problems, thus reducing the potential of adverse health effects from poor IAQ.

The occurrence of IAQ-related health and comfort problems may diminish morale and reduce worker productivity. Improving IAQ and reducing health problems can provide a more productive work environment.

**Effective IAQ Management and the Bottom-line**

Developing a strong IAQ program makes smart business sense for building owners and

managers concerned about their bottom line and tenant satisfaction. As tenants learn more about IAQ, they may increasingly value buildings with good IAQ, and look critically at buildings that do not practice proactive IAQ management. Given the sensitivity of building tenants to HVAC, IAQ, and housekeeping issues, implementing good IAQ management practices can significantly improve tenant satisfaction. Even small improvements in vacancy or turnover rates can have significant revenue implications for the Building owner. One government publication reported that the annualized cost of losing a 5,000 SF tenant in a 100,000 SF building is \$1.50/SF.

In an effort to control costs, building owners and managers may fail to pay adequate attention to HVAC performance, maintenance procedures, and other factors important to IAQ. Reducing HVAC maintenance may save building owners up to \$0.50 per square foot in the short run, but may cost them more in the long run due to a higher rate of tenant turnover, more frequent repair, and shorter equipment life.

Reducing HVAC maintenance may also cost tenants in the form of lower productivity. Labor costs to the tenant are typically about \$150 to \$200 per square foot. From a tenant's perspective, therefore, a 3 percent reduction in productivity would be valued at approximately \$4 to \$6 per square foot. In other words, employee morale and productivity carry a higher premium for tenants than any cost savings anticipated by building owners who cut corners on HVAC maintenance. Therefore, buildings with good IAQ should benefit from decreased operating costs, increased efficiency, enhanced marketability, and reduced risk of liability. Likewise, tenants should benefit from improved health and increased productivity. It makes economic sense for both groups to make a strong commitment to achieve and sustain good IAQ.

## OVERVIEW OF ACTION PLANS

The Action Plan is the core of the IAQ program. The Action Plan is designed to lead the building owner and manager through a logical set of steps for good IAQ management.

For the most part, the actions are derived from the *Building Air Quality Guide* and represent expert consensus on good IAQ management. The following contains a summary of some of the specific steps involved in implementing the program and must be used in conjunction with the *Building Air Quality Guide*. In some cases, the *Building Air Quality Guide*

will provide general guidance and explanation for a particular action. It may be beneficial to supplement this with other sources of information for more specific direction. Many of these sources are listed in the references to this paper.

### Building Checklist

To assist in implementing the Action Plan it is useful to fill out a building checklist. By answering the questions on the checklist, the building manager should be able to determine if his or her building already meets good IAQ requirements, or whether additional steps need to be taken to bring the building up to an acceptable level.

### Action Plan-Initial Activities

#### Step 1: Designate an IAQ Manager:

The first step for is to assign the job of IAQ Manager. The IAQ Manager can be an employee of the building owner or manager or an independent consultant, and may be responsible for IAQ in more than one building. The IAQ Manager may choose to seek assistance from outside contractors or consultants, but must retain primary responsibility. Once designated by the owner, the IAQ Manager will be responsible for the implementation of the rest of the Action Plan. The IAQ Manager will be the focus of indoor air quality activities in the building. Managing building IAQ, keeping occupants informed and involved, will be greatly facilitated by giving this one person overall responsibility for IAQ.

#### Specific Activities:

- Choose an IAQ Manager to meet criteria in the *Building Air Quality* guide.
- Train IAQ Manager.
- Have IAQ Manager implement the Action Plan and complete the Building Checklist.

An effective IAQ Manager can come from a variety of backgrounds. Since indoor air quality is a field that requires the application of many disciplines to prevent and solve IAQ problems, no single field encompasses all the principles and skills that will be needed. Examples of the types of building staff who might be designated as IAQ Manager include the facility manager, building operating engineer, the health and safety director, the public health nurse, or the employee-relations manager. Keep in mind that the IAQ Manager will be working as a "team leader," so where she or he lacks specific skills, another

person can compensate. Nevertheless, it is critical that the IAQ Manager is trained to be familiar with the building's structure and function and sufficiently conversant with IAQ issues to communicate effectively with occupants, facility personnel, and building owners.

It is essential that the IAQ Manager thoroughly understand the contents of *Building Air Quality: A Guide for Building Owners and Facility Managers*. It is strongly encouraged that the IAQ Manager complete a seminar based on the EPA's *Building Air Quality Guide*.

#### Step 2: Develop an IAQ Profile of the Building

The next step in the process is to learn about the current IAQ situation and existing building operation and maintenance practices. The *Building Air Quality Guide* refers to this step as developing a "Building IAQ Profile." The Building IAQ Profile describes the features of your building's structure, function, and occupancy that impact IAQ. By completing the Building IAQ Profile, you will gain an understanding of the current status of air quality in your building and baseline information on the factors that may cause problems in the future.

The IAQ Profile focuses on 1) identifying and reviewing records, such as manuals and operating instructions; 2) conducting a walkthrough inspection to gather information; and 3) detailing IAQ-related HVAC practices and possible pollutant sources.

The first part of developing the Building IAQ Profile focuses on identifying and reviewing the documents that should already exist at your building. You may find that you cannot locate many of the documents on the checklist, in which case you should try to collect these from outside sources if at all possible. The original architects and/or engineers may be useful sources for this information.

Identify, review, and familiarize yourself with construction and operating documents including: "As built" blueprints that have been up-dated to indicate current conditions, updated HVAC operating and maintenance manuals, up-to-date drawings of tenant buildouts and interior building renovations, test and balancing reports, information on major space use changes, and up-to-date information on building pressure relationships. If you do not have "as built" blueprints, complete the HVAC Checklist Long Form in *Building Air Quality*, pages 195-209. Request from suppliers and keep on file MSDSs for products used

in the building.

From your records, determine how many cubic feet per minute (CFM) of outside air the HVAC system was designed to deliver and, if possible, compare with the CFM it is actually delivering. Determine current heat loads of the building and compare with HVAC Capacity.

Part Two: Conduct a Walkthrough to Assess Current IAQ Situation Specific Activities. Conducting a building walk through inspection will help you acquire a good overview of occupant activities and building functions that may impact IAQ. Even if you are intimately familiar with the operations of your building, the walkthrough will allow you to view your building specifically with IAQ in mind. As you walk through your building, pay careful attention to indicators of possible IAQ problems. Simple, seemingly inconsequential items such as discolored walls and ceilings, or fans on occupant desks, could indicate IAQ problems such as mold growth or inadequate ventilation or cooling.

Part Three: During the walkthrough, complete a pollutant/source inventory using the Pollutant/Source Inventory Form, *Building Air Quality*, pages 213-219, or comparable list or drawing. Look for IAQ problem indicators including odors, dirty or unsanitary conditions, visible fungal growth, poorly-maintained filters, mold or mildew, staining or discoloration of building materials, smoke damage, presence of hazardous substances, potential for soil gas entry, unusual noises from equipment, leaks, uneven temperatures, overcrowding, and blocked vents. Significant sources of contamination should be directly exhausted to the outside.

#### Step 3: Address Existing and Potential IAQ Problems.

While conducting the walkthrough and developing the IAQ Profile, you may have identified existing or potential IAQ problems. These will need to be addressed. Some IAQ problems are easy to diagnose, especially using the knowledge gained from the *Building Air Quality Guide* and the Building IAQ Profile. In other cases, though, IAQ problems can be very complex and involved, and diagnosing them may require outside assistance by IAQ professionals. You may want to investigate and identify expert resources (including outside experts) before problems occur.

The flow chart on page 45 of the *Building Air*

*Quality Guide* shows the general scheme of conducting an IAQ investigation. It is impossible to prescribe one specific set of steps that will work for every IAQ problem. Instead, please read the *Building Air Quality* guide, Section 6, for a general understanding of the many tools available in an IAQ investigation.

#### General Strategies to Correct IAQ Problems:

- Identify and control sources to remove or reduce the source, seal or cover the source, or modify the environment.
- Improve ventilation to provide fresh air to occupant and to dilute pollutants
- Improve air filtration to clean air from outside and inside the building
- Control occupant exposure through administrative approaches such as scheduling contaminant-producing activities with IAQ in mind.

The mitigation or correction of IAQ problems is another area where there are a large number of possible actions. Refer to the *Building Air Quality Guide* for a more complete discussion. In some cases, full mitigation of a problem may be outside of the control of the building owner or manager (for example, trucks idling in an adjacent alley or exhaust from a nearby building).

#### Specific Steps:

- Identify in-house and contractor personnel whose functions could impact IAQ
- Provide training and information to in-house personnel and contractors
- Develop a flow of information from building staff to the IAQ Manager.

The process of improving IAQ involves a number of activities that require ongoing attention and commitment. Steps 4-7 of the Action Plan focus on developing and implementing standard procedures and practices for operating and maintaining the building so that IAQ awareness is routinely incorporated into building management.

#### Step 4: Educate Building Personnel about IAQ Management

It is important that building staff is knowledgeable about IAQ issues. Facility personnel generally are not trained to think about IAQ issues as they go about their work. As a result, staff may observe situations that could indicate potential or existing IAQ problems, but fail to recognize them. Educating building personnel about IAQ issues will make them a valuable agent in preventing IAQ problems. Training, both informal in-house information sharing and formal training courses, is beneficial.

#### Step 5: Develop and Implement a Plan for Facility Operations and Maintenance

IAQ can be affected both by the quality of maintenance and by the materials and procedures used in operating and maintaining the building's components. Keeping IAQ in mind when you plan for operations and maintenance is a good way to prevent IAQ problems. A written preventive maintenance program is an effective tool for improving IAQ. The plan should include monitoring, inspecting, and cleaning HVAC components such as outside air intakes, outside air dampers, air filters, drain pans, heating and cooling coils, the interior of air handling units, fan motor and belts, air humidification and controls, and cooling towers. Pages 34-36 of the *Building Air Quality Guide* contain general information on maintenance activities while pages 124-135 detail specific HVAC components, their role in IAQ, and instructions for preventive maintenance. Frequency of maintenance activities may vary from building to building. It is important that you develop a maintenance schedule based on the needs of your building.

#### Specific Steps:

- Operate HVAC system during periods of significant activity and confirm that written operating schedules reflect this.
- Operate HVAC system with outside air dampers at least partially open prior to occupants' arrival.
- Develop and follow a preventive maintenance plan that includes maintenance schedules.
- Inspect outside air dampers for nearby sources of contamination,
- Ensure that air dampers are clear of obstruction and operating properly.

- Regularly replace or clean air filters
- Clean and inspect drain pans,
- Inspect and clean heating and cooling coils.
- Inspect and clean interior of air handling units,
- Inspect fan motors and belts,
- Regularly inspect and clean air humidification equipment and controls,
- Inspect, clean, and treat cooling towers,
- Inspect and clean air distribution pathways and variable air volume (VAV) boxes,
- Update your maintenance plan when equipment is added, removed, or replaced

Step 6: Manage Potential Indoor Pollutant Sources, including Remodeling and Renovation, Smoking, Housekeeping, Pest Control, and Shipping and Receiving.

Indoor contaminants can be drawn in from outside or can originate within a building. If contaminant sources are not controlled, IAQ problems can arise, even if the HVAC system is well maintained and running properly. Step 6 involves managing some of the major sources of indoor contaminants in your building including: 1) remodeling and renovation, 2) smoking, 3) housekeeping, 4) pest control, 5) shipping and receiving, and 6) microbial contamination.

1) Unless renovation, redecorating, and remodeling are planned with IAQ in mind, these activities can create indoor air quality problems by producing dust, odors, micro-organisms and their spores, and emissions of volatile organic chemical compounds. Take steps to prevent IAQ problems when some building areas are undergoing renovation while adjoining areas continue normal operations. These steps include scheduling work during periods of minimum occupancy, arranging ventilation to isolate work areas, using specialized cleaning procedures, changing filters, minimizing emissions, and protecting equipment.

2) Environmental tobacco smoke (ETS) can be a source of complaints. While there are no federal regulations on ETS at present, many municipalities, employers, and building owners either prohibit

smoking or restrict where smoking can take place. Establishing a smoking policy is essential to maintaining good IAQ in your building. To accomplish this, you should institute a smoking policy that prohibits smoking or provides direct exhaust and adequate ventilation to areas where smoking is permitted. The only exception that can be considered is for mixed-use buildings that have bars and restaurants that allow smoking and that are ancillary to the main use of the building. In those cases, the bar or restaurant's ventilation system must be isolated from the rest of the building's ventilation system.

3) Inadequate housekeeping can cause IAQ problems, but cleaning materials themselves may be contaminant sources by producing odors and emitting a variety of chemicals.

4) Pest control methods often depend on the use of pesticides whose storage, application, and handling can have serious health effects. These necessary activities must be dealt with carefully to avoid indoor air quality problems. One approach to consider is Integrated Pest Management which emphasizes the use of non-chemical pest management practices wherever practical. The EPA Brochure, "Pest Control in the School Environment: Adopting Integrated Pest Management," may provide useful information on integrated pest management practices.

5) Shipping and receiving areas have the potential to create indoor air quality problems regardless of the types of materials being handled. Building managers should take steps to prevent loading dock vehicle exhaust from entering into the building.

6) Microbial contamination of building systems can cause major IAQ problems. Building managers should control microbial contamination by routinely inspecting for, and promptly repairing water leaks that can promote growth of biologic agents, by promptly drying, replacing, removing, or cleaning damp or wet materials and removing visible microbial contamination in ductwork, humidifiers, other HVAC and building system components, or on building surfaces when found during regular or emergency maintenance activities or during visual inspection.

#### Specific Steps:

- Request information from product suppliers on contaminant emissions.
- Discuss IAQ concerns with architects, engineers,

and contractors.

### Remodeling and Renovation

- Use and require contractors to follow special procedures described in *Building Air Quality guide*, page 6, to minimize contaminants and odors during renovation and remodeling

### Smoking

- Institute a smoking, which prohibits smoking or provides direct exhaust and adequate ventilation to areas where smoking is permitted.

### Housekeeping

- Prepare and follow written housekeeping procedures that detail the proper use, storage, and purchase of cleaning materials.

- Be aware of the housekeeping products and equipment used in your building, particularly those that are potential irritants or have other IAQ impacts.

- Purchase the safest available housekeeping products that meet your needs.

- Educate housekeeping staff or contractors about cleaning schedules, purchasing, materials storage and use, and trash disposal.

### Pest Control

- Know what pest control products are used in your building.

- Prepare written pest contract procedures that detail the proper use, storage, and purchase of pesticides according to label directions.

- Use non-chemical pest control strategies where possible.(called Integrated Pest Management)

### Shipping and Receiving

- Take steps to prevent vehicle exhaust from entering building.

Step 7: Communicate with Tenants/Occupants about Indoor Air Quality.

Managing occupant relations can be an effective way to prevent IAQ problems. It is important for building occupants to understand that their activities

can create indoor air quality problems and that their cooperation is critical for maintaining good IAQ in their building.

### Specific Steps:

- Distribute "A Building Occupants Guide to Indoor Air Quality" to building tenants/occupants.

- Routinely inform tenants and occupants about building conditions and policies that may impact IAQ.

- Notify tenants and occupants when major renovation, remodeling, maintenance, or pest control activities are planned.

### Step 8: Establish Procedures for Responding to IAQ Complaints

Occupant complaints about IAQ may be vague or specific, but they should always be taken seriously and investigated promptly and fully. In many cases, the IAQ Manager may be alerted to potential IAQ problems from occupants. Establishing procedures for responding to and resolving complaints will help ensure that all complaints are handled in a consistent and fair manner.

### Specific Steps:

- Prepare and follow clear procedures for recording and responding to IAQ complaints, including:

- Logging entries into your existing work-order system,
- Collecting information from complainant,
- Determining response capability of in-house staff,
- Identifying appropriate outside sources of assistance,
- Providing feedback to complainant,
- Following-up to ensure that remedial action has been effective,
- Inform building staff of these procedures.

### Record Keeping

One important element underlying the actions is the development and maintenance of a comprehensive, easy-to-use record keeping system. The Building Checklist should contain questions regarding the availability and location of records. The IAQ Manager may want to designate an area such as a file cabinet, bookshelves, or notebooks to store information on the IAQ program, including steps taken to complete the Action Plan. Alternatively, the



IAQ Manager may wish to develop a single list of all pertinent IAQ records and their locations. These records will be a valuable tool to help the IAQ Manager coordinate the day-to-day activities.

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