Section 1

Indoor Air Quality Management Plan

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A. Purpose/Scope

The purpose of this document is to provide building operational standards to ensure good indoor air quality within Mounds View School facilities. The intent of this plan is to proactively manage indoor air and provide a healthy and safe indoor environment for students, staff and community.

This "Living Document" is to be reviewed annually or more often if significant changes are needed to assure individual building air quality is being addressed.

B. Goals for Quality Indoor Air

Note: Add/Delete goals as necessary.

Mounds View Public Schools have identified the following goals to assure quality indoor air within its facilities. Each goal has been developed to allow for easy evaluation and auditing.

1. Provide sufficient outside air to all occupied spaces.

   - ♦ All new renovation and construction of mechanical/ventilation systems will be based on owner determined occupancy loads to ensure 15 cubic feet per minute of outside air per person.

   - ♦ Ensure that all ventilation systems are operating at design parameters and no less than 5 cfm/person of outside air.

   Note: The District's long-term goal is to upgrade facilities to provide 15 CFM/person of outside air. The short-term goal is to provide quantity of outside air as per original design or greater, if possible with existing systems.

2. Improve effectiveness of cleaning buildings and ventilation systems through better procedures and equipment.

   - ♦ Install vacuum cleaners with higher efficiency filter bags (filter particle size down to .1 micron with 90% efficiency).
   - ♦ Inspect HVAC system regularly and clean as necessary.

3. Reduce volatile organic compound (VOC) exposure by controlling cleaning chemical quantity and usage time.

   - ♦ Use only those cleaning chemicals approved by District.
   - ♦ Ventilate building during cleaning to purge contaminants.
   - ♦ Follow District standard for low VOC cleaning chemicals whenever possible.

4. Reduce infiltration of moisture/water into buildings.

    - Establish a baseline of present condition of building envelope and prioritize for corrective actions.
    - Conduct ongoing roof/building facade evaluation and replacement/remediation cycle.
    - Perform routine tunnel inspections and develop remedial action, if necessary.

5. Provide education/training to various staff including teachers, custodians and maintenance personnel.

    - Train staff to be observant of IAQ problems.
    - Train maintenance personnel to assure quality preventive maintenance as it relates to IAQ.
    - Train custodial staff on the importance of quality cleaning and cleaning chemical usage.
    - Educate and inform staff of the relationship between facilities and health. Instruct staff on the importance of maintaining classroom space and self-management.

C. Background Information

Although indoor air quality problems have been around since, perhaps, the first building was constructed, it wasn't until recent years that the subject of indoor air quality was viewed as a concern by facility managers and building occupants. In fact, over the past two decades, the Environmental Protection Agency (EPA) and the National Institute for Occupational Safety and Health (NIOSH) have been responding to a growing number of questions and concerns related to indoor air quality.

One of the major reasons for current indoor air quality problems is the effect that the energy crunch of the 1970s had on building design. As an energy conservation measure, buildings were constructed with windows that would not open, and a building's exterior shell was tightly constructed to prevent energy loss. Coupled with inadequate or improperly operated or maintained Heating, Ventilation and Air Conditioning (HVAC) equipment, contaminants can become trapped within these buildings and result in air quality problems, or Sick Building Syndrome (SBS). In fact, a committee of the World Health Organization estimates that as many as 30% of new or remodeled buildings may have unusually high rates of sick building complaints.

FAQs

(Frequently Asked Questions)

What is Indoor Air Quality?

Today, the public is becoming increasingly concerned about factors that must be considered in order to create a safety environment for learning. The quality of air in schools is one of those factors.

If indoor air quality problems do exist in your building and are indeed affecting individuals, they must be identified and remedied to the extent possible.

What are the goals of a school indoor air quality management plan?

The goal of an indoor air quality management plan for a school is to provide indoor air quality that contributes to a favorable learning environment for students, productivity for teachers and staff as well as health for occupants. The proper management of indoor air quality in schools reflects on the stewardship of the public's investment in education.

However, the intent of the management plan is not to solve all indoor air quality concerns in a school. Rather, the intent is to provide a road map to assist in managing indoor air quality.

A school indoor air quality management plan should include guidance that encourages the prevention as well as the timely resolution of indoor air quality problems as they arise with minimal cost and disruption. The U.S. Environmental Protection Agency (EPA) has developed *Indoor Air Quality: Tools for Schools* that focuses on a limited number of basic operations and maintenance activities that school staff may implement as part of an indoor air quality management plan.

A healthy indoor environment consists of many factors, including good air quality. When all factors are properly aligned and working together, the building environment contributes to the productivity, comfort and a sense of health and well being of building occupants.

Good air quality is an important component of a healthy indoor environment. For the purposes of this document, the definition of good air quality includes:

- Introduction and distribution of adequate ventilation air (outside air).
- Control of airborne contaminants.
- Maintenance of acceptable temperature and relative humidity.

It is important to remember that while occupant complaints may be related to time at work, they may not necessarily be due to the quality of the air. Other factors such as noise, lighting, ergonomic stressors (workstation and task design), and job-related psycho social stressors can – individually and in combination – contribute to the complaints.

As research continues and our knowledge grows, the design, alteration, renovation, and management of buildings with an emphasis on indoor air quality will become more prevalent, as will remediation options for existing facilities suffering from Sick Building Syndrome.

D. Process Utilized

Mounds View Schools followed a logical process as described in the "Tools for Schools" document to develop this plan. The specific process included:

- Interview with building engineer/principal to develop a database of the occupants present satisfaction with the quality of indoor air.
- A baseline assessment of the indoor air quality within each facility which included appropriate indoor air quality tests.
- Problems isolated were appropriately remediated or a plan was set up for remediation.

FAQs

What Does Good Indoor Air Quality Imply?

Good indoor air quality implies that the following indoor environmental conditions are present:

- Temperatures are within the range that most occupants consider comfortable.
- Airborne pollutants that are generated within the space (e.g. copiers, printers, cleaning products) are purged by adequate air exchange or other means. Carbon dioxide levels are satisfactory.
- Other airborne pollutants that are not indigenous to the space are not present.
- The ventilation system provides adequate and uniform air movement to avoid the perception of stuffiness.
- Most of the occupants do not experience eye. Respiratory, or mucous membrane irritation or allergic-like symptoms when in the space.

What can I do to help?

- Drink plenty of water (speaking all day, chalk dust, beverages like coffee and alcohol, and low humidity levels tend to make people very dehydrated).
- Be on the lookout for blocked vents/units.
- Don't over water plants—this may cause leaking on floors/surfaces.
- Keep eating/drinking to a minimum in carpeted rooms/areas.
- Wet-wipe dusty surfaces to reduce amounts of airborne dust.

E. Historic Review

Past policies and programs have had a significant impact on today's indoor air quality. The following is a brief summary of how indoor air quality problems have come to light today.

- **Energy Conservation**

  The energy crisis of the early 1970s caused building owners to expend considerable effort toward energy conservation. Buildings were planned and renovated to reduce outside air infiltration. Window and door openings were reduced and more tightly sealed. Outside air quantities for mechanical systems were minimized. In some cases, the operating times for heating, ventilation, and air conditioning equipment were decreased. Standards were reduced for the number of air changes in a room. Buildings became more compact in an effort to minimize perimeter wall surface, thereby reducing heat loss or heat gain. Modern buildings have more interior space with no direct access to exterior walls. As a result, modern facilities are more likely to retain potentially hazardous contaminants such as particles and gases for longer periods of time and in higher concentrations than ever before.

  The thermal environment also may have been adversely affected by these energy conservation measures. For example, to reduce the need to reheat conditioned air, the temperature of the cooling medium frequently was raised. This resulted in increased humidity, reduced human comfort, and an enhanced environment for the growth of bacteria, fungi and other biological contaminants.

  However, it is important to emphasize that an energy efficient building can also provide good indoor air quality.

- **Product Technology**

  The number and type of contaminants introduced into indoor air by new products have grown rapidly in the last few decades. Each year, new products are introduced for use during and after the construction of buildings. The effects of these products and materials on humans often cannot be predicted. Many years may pass before the dangers of a chemical are realized and brought into public awareness. Consider, for example, the past and present uses of formaldehyde, asbestos, tobacco and solvents released by glues. Product technology has given us materials that directly affect the quality of indoor air in ways that are of increasing concern to building planners and users.

- **Maintenance**

  Evolving issues from architects, design codes, energy crisis, building additions, and budget crunches have challenged building maintenance objectives. As a result, maintenance manpower and activities, such as changing air filters, routine vacuuming, and preventative maintenance (i.e., lube/belt replacement) have been compromised or have not occurred. The evaluation of maintenance practices will come about as we begin to understand their relationship to indoor air quality. Maintenance functions must receive sufficient funding if we are to ensure the health and safety of students, staff, and community usage of facilities.

- **Education and Training**

  People who plan, design, maintain, and operate buildings have not received formal education or in-service training regarding indoor air quality. Practicing architects, engineers, educational facility planners, and maintenance/operations personnel may not have received training in the link between their decisions and the quality of indoor air. Because IAQ is a relatively new concern, these and other health-related subjects are frequently absent from the curricula in architectural and engineering schools. Indoor air quality is discussed in terms of thermal comfort but not as an environmental health factor. Workshops are now emerging that are specifically geared to those people involved in the planning and operation of school facilities; however, they do not begin to meet the need. More in-service training programs and professional continuing education courses will have to be provided to fill this educational gap.

- **Change in Building Use**

  Changes in programs during the life of a building are common in the educational field. These changes can be initiated by federal laws, such as P.L. 94-142 (Education for All Handicapped Children Act of 1975) or by unique state and local program implementation. Facility planners or the operations and maintenance staff may have to modify school buildings to accommodate the new use. Building changes often take the form of spatial modifications, the addition of new equipment, or alternations to the electrical and lighting systems. Many times, the mechanical or air distribution systems receive little or no corresponding change, which results in poor quality of indoor air due to over (or under) heating, cooling, and/or ventilation.

- **Cost of Construction**

  Construction costs have escalated in recent decades. To reduce costs, building technology has been used to decrease the volume of a building, reduce the number of windows, create multi-use educational spaces, and/or simplify mechanical system designs. Cost decisions can and do have a negative impact on the quality of indoor air by creating buildings with few or no operable windows and mechanical systems that offer minimal ventilation under optimum conditions. Increasingly, planners will need to include indoor air quality concerns in construction cost decisions.

F. District Policy

The District understands the importance of providing quality indoor air to our staff, students and community. The District is committed to ensuring that acceptable indoor air quality is provided and maintained in all District buildings. The Management Plan provides the tools to help provide acceptable indoor air quality.