Indoor Environmental Quality Policy

Reviewed: August 2013

1. Applicability

This policy applies to indoor environmental quality in all OHSU-owned buildings and leased spaces.

2. Scope and Purpose

This policy is intended to assure that all employees working in any OHSU owned or leased building are provided with an indoor environment that is safe, comfortable and free from contaminants or conditions that may adversely impact health outcomes. There may be contract restrictions in leased spaces in which the owner may have specific control over conditions.

3. Background

Indoor environmental quality is a real but highly complex issue that often involves a multitude of factors and building systems. Indoor air quality problems can be very complicated due to the complexity of the buildings and ventilation systems, highly charged emotions from occupants, and the fact that standard epidemiology and industrial hygiene evaluation techniques can be inconclusive. Employee symptoms are often similar to common ailments not necessarily attributed to building air/environmental quality. There are few, if any, applicable regulations and standards, and research is ongoing on employee health issues, at exposure levels typically encountered in indoor environments.

Many indoor air quality (IAQ) complaints are related to mucous membrane and/or respiratory irritation, headache, or fatigue. This would include but is not limited to; itching, redness, irritation of the eyes, nasal congestion, coughing, runny nose, dryness and irritation of throat. However these symptoms are not unique to IAQ issues.

4. Definitions

a) Indoor Environmental Quality (IEQ) – An indoor environment with an acceptable and reasonable degree of comfort and air quality that minimizes the development of adverse health complications. Indoor environmental quality addresses both physical hazards (illumination, comfort, ventilation, etc.) and health hazards (chemical and bio-aerosol exposures). Indoor environmental quality concerns may include reports of unusual or obnoxious odors and physical symptoms (i.e.: eye and respiratory irritation, and headaches).

b) Acceptable Indoor Air Quality – A level of air quality that does not adversely impact health status and may be attained through diligent but reasonable measures. OHSU

defines acceptable indoor air quality as air in which there are no known contaminants at harmful levels set forth in this document.

c) Permissible Exposure Limits (PEL) – Occupational Safety and Health Administration Permissible Exposure Limit -- this level is a time-weighted average and is an enforceable standard that must not be exceeded during any eight-hour work shift of a 40-hour work week.

d) Threshold Limit Value (TLV) - American Conference of Governmental Industrial Hygienists Threshold Limit Value -- this level is a recommended time-weighted average upper limit exposure concentration for a normal eight to 10-hour workday and a 40-hour work week

e) ASHRAE – an acronym for the American Society for Heating, Refrigeration and Air-Conditioning Engineers. ASHRAE sets consensus standards regarding HVAC performance and IEQ. These are often used as best practices in industry.

f) HVAC – an acronym for heating, ventilation and air-conditioning.

g) Bio-aerosol – an airborne contaminant that is biological in origin, such as bacteria, viruses, molds, pollens, insect debris, and cellular components, such as proteins.

4. Best Practice Guidelines

The levels and ranges for indoor air constituents listed in the table below are deemed protective of the general population, but may not be appropriate for hypersensitive individuals. A small percentage of workers, because of age, sex, genetic factors, personal habits (such as smoking, alcohol consumption, and drug use), medication, or previous exposures, may experience adverse health effects from some substances at levels even lower than best practice standards:

PARAMETER	ASHRAE	OSHA PEL	ACGIH TLV
Humidity	40% - 60 %	N/A	N/A
Temperature	68 - 75 (winter) 73 – 79 (summer)	N/A	N/A
Carbon Dioxide	1,000 ppm (<800 ppm preferred)	5,000 ppm	5,000 ppm
Carbon Monoxide	9 ppm	50 ppm	25 ppm
Hydrogen Sulfide	N/A	20 ppm	10 ppm
Ozone	N/A	0.1 ppm	0.05 ppm
Particulates	N/A	15 mg/m ^{3} (total) 5 mg/m ^{3} (resp.)	10 mg/m ^{3} (total) 3 mg/m ^{3} (resp.)
Formaldehyde	N/A	0.75 ppm	0.3 ppm
Nitrogen Dioxide	N/A	5 ppm	3 ppm

5. Indoor Air Quality Investigation Procedure

Concerns should be reported through managers or higher levels of administration:

a) Report uncomfortable temperature, ventilation, or lighting concerns to Facilities & Real Estate or building management.

b) Report poor sanitation that may affect air quality to housekeeping/custodial services for your area.

c) All other reports associated with indoor environmental quality shall be directed, via a manager, to Environmental Health and Radiation Safety (EHRS):
   - Marquam Hill Campus and off-site locations: 503 494-7795
   - West Campus: 503 690-5390

Investigation will be conducted by EHRS and may include interviews, observations, and analytical monitoring. A typical investigation will look at the following:

1. Inadequate Ventilation -- These problems involve lack of adequate fresh air and uneven distribution of fresh air within a building.

2. Humidity and Temperature -- These problems involve levels of these parameters outside the normal comfort range.

3. Inside Contamination -- Copy machines, office products, and chemicals stored indoors have been identified as significant sources of indoor air problems in some investigations.

4. Outside Contamination -- This is caused by the re-entrainment of previously exhausted contaminants, generally caused by improper air intake placement or by periodic changes in the wind conditions. A common problem is vehicle exhaust fumes from parking garages, loading docks, and helipads being drawn into a building ventilation system.

5. Microbial Contamination -- This type of problem is usually associated with water leaks, water infiltration, elevated indoor humidity, humidifiers, and contaminated ventilation ductwork.

6. New Building Materials -- This results from building materials (including carpeting) releasing gasses into the air during and shortly after the materials are first installed. Increased ventilation after installation will enhance the dissipation of these chemicals. These problems usually resolve with time.

In some cases IAQ investigation may require; monitoring for specific chemical contaminants.

EHRS will submit a report to the affected parties describing the reported concerns, findings, and recommendations. Risk Management may provide consultation if the concerns result in Workers Compensation reports and/or claims.

Remediation is generally the responsibility of Facilities & Real Estate or building management. EHRS may provide oversight for, and validation of, these activities. Costs of remediation may be incurred by departments if causal factors are associated with department operations.

6. Injury and Illness

If individuals experience adverse health effects suspected to be contributed to by the indoor environment, they shall immediately notify their supervisor and should arrange for medical attention. This should be in consultation with Risk Management. An injury report must be completed on the Worker and Student Injury Reporting System (WSIRS) system.

7. Responsibilities

a) Employees – Report problems when they become apparent to supervisors/managers, and participate in investigations.

b) EHRS - Investigate and report potential IEQ issues utilizing approved techniques and current information available. Provide consultation for remediation activities.

c) Facilities & Real Estate, Design & Construction, and building management – Assist with investigations and any necessary remediation building systems. Provide information about products used in construction, remodeling, or demolition of a work space that may be associated with IEQ concerns. Provide engineering blueprints that aid in evaluating workspaces and involve EHRS in advance of scheduled building renovations.

d) Departments – Provide single point of contact for communication during investigation and remediation phases. Cost of indoor air quality evaluations may be incurred by departments, if likely source or need is related to department work activity. This will be evaluated on a case-by-case basis.

8. Limitations of IAQ Investigations

a) Sampling methodologies and acceptable limits have been established for many contaminants. However, occupants may continue to experience discomfort at contaminant levels below standards for occupational exposure. Also, individual sensitivities vary.

b) Sampling and measuring indoor mold contamination on surfaces is of limited value because mold is found in virtually all environments, and because no consensus or regulatory standards have been established. One of the problems with establishing standards is that individual sensitivity to mold varies greatly

9. References

ASHRAE Standards 62-2001 and 55-2004
AIHA Field Guide for the Determination of Biological Contaminants in Environmental Samples
AIHA Report of Microbial Growth Task Force
ACGIH Guidelines for the Assessment of Bioaerosols
EPA Indoor Air Quality