University of Vermont

Department of Environmental Health and Safety
Occupational Health and Safety Office

321 Ryan Street
Essex, Vermont 05452

INDOOR AIR QUALITY MANAGEMENT PROGRAM

In accordance with
OSHA Publication 3430-04 2011
EPR Publication EPA-402-K-97-003, October 1997
ASHRAE 62.1-2012 and 55-2010
ASTM E1971-05

REVISED AND DISTRIBUTED BY:

THE UNIVERSITY OF VERMONT
DEPARTMENT OF ENVIRONMENTAL HALTH AND SAFETY
OCCUPATIONAL HEALTH AND SAFETY OFFICE

REVIEWED BY:

DEPARTMENT OF ENVIRONMENTAL HALTH AND SAFETY
OCCUPATIONAL HEALTH AND SAFETY OFFICE

Occupational Health and Safety Manager
Occupational Health Program Coordinator

September 2025

University of Vermont

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EMERGENCY AND ASSISTANCE

No work will be performed where an emergency cannot be immediately observed and/or prompt rescue assistance summoned.

FIRE – POLICE – RESCUE – EMERGENCY MEDICAL SERVICE…….. 9-1-1

Dial 911 and tell them you are at the University of Vermont. Provide them with your building address, building name, and room number as well as the details of your emergency.

> CALL IMMEDIATELY FOR ANY EMERGENCY
> INCLUDING CHEMICAL SPILL, FIRE, INJURED,
> TRAPPED, OR SICK PERSON.

UVM POLICE SERVICES…… (802) 656-3473
FIRE – POLICE – RESCUE – EMERGENCY MEDICAL SERVICE

UVM Medical Center - Emergency Department …… (802) 847-2434
111 Colchester Avenue, Main Campus, West Pavilion, Level 1, Burlington, VT 05401
(Medical emergency and evaluation)

Champlain Medical Urgent Care…… (802) 448-9370
150 Kennedy Drive, South Burlington, VT 05403
(Medical consultation and evaluation)

UVM and Other Administrative Offices

Department of Environmental Health and Safety…… (802) 656-7233
Occupational Health and Safety Office ohso@uvm.edu

Service Operations Support…… (802) 656-2560
(Physical Plant Department, chemical cleanup, disposal, and storage) sos@uvm.edu

Department of Risk Management…… (802) 656-3242
(Accident investigations, insurance services) risk.management@uvm.edu

1.0 PROGRAM STATEMENT

1.1 Purpose

The University of Vermont (UVM), Department of Environmental Health and Safety (EHS), Occupational Health and Safety Office (OHSO) is dedicated to providing safe work facilities for UVM Personnel (UVM employees (faculty/staff), students, and visitors, including contractors and consultants) and complying with federal and state occupational health and safety standards.

UVM Personnel should have a clean, healthy environment in which to work, study, and perform various activities. If the air quality is poor, it can affect a person's comfort, health, and productivity. UVM is committed to providing indoor environments that are free of contaminants and airborne disease agents. This document provides guidance in how select the correct response actions following a reported concern or evidence of an indoor air quality issue inside a UVM building or facility.

All UVM Personnel, including administrators and union representatives, share responsibility in responding in event of an indoor air quality complaint.

1.2 Standards

The information in this written program is intended to provide basic procedures in response to an indoor air quality complaint and is a means to analyze workplace conditions, contributing factors, and determine appropriate corrective actions against occupational workplace hazards. Additionally, this program is written in accordance with:

OSHA Publication 3430-04 2011
EPR Publication EPA-402-K-97-003, October 1997
American Society of Heating, Refrigeration and Air-Conditioning Engineers 62.1-2012
American Society of Heating, Refrigeration and Air-Conditioning Engineers 55-2010
American Society for Testing and Materials (ASTM) E1971-05

1.3 Scope

While most IAQ complaints revolve around strange odors or non-specific symptoms, some are the result of a potentially hazardous source. IAQ complaints can range from single isolated events involving comfort (temperature, relative humidity, drafts) or unfamiliar smells/odors, to more complex issues where the air quality may be suspected of causing illness. Identifying the underlying cause(s) can be very simple or extremely challenging as there can be many variables in play including potential sources, building functions, mechanical systems, and varying individual sensitivities.

The objectives of this written program are:

1. Reduce the levels of indoor air pollutants through preventative measures such as routine housekeeping, maintenance activities, periodic building evaluations and inspections, and IAQ-specific policies and procedures.
2. Provide and maintain adequate air flow by maintaining and repairing ventilation equipment, which will promote a comfortable and healthy environment for faculty, staff, and students.
3. Respond to IAQ-related concerns and complaints in a prompt and thorough manner and effectively communicate the progress of investigative and corrective actions to all impacted parties.

All UVM Personnel are encouraged to report all IAQ concerns regardless of how minor they may seem. Although an expedient response is critical, taking short cuts can have undesirable consequences such as occupational exposures, odor problems, and other hazards. For prompt corrective action of an IAQ

concern, immediately call Service Operations Support (SOS). SOS will contact the appropriate UVM personnel to respond. Work tasks shall be arranged through appropriate channels. A Work Order in UVM's enterprise Integrated Work Management Software (IWMS) Planon shall be submitted. It is recommended an IAQ Occupant Questionnaire found in *Appendix A* be completed and provided to OHSO. The questionnaire helps reduce misunderstanding and creates a history that can be referred to at a future date.

These guidelines for addressing IAQ issues are general and do not cover all possible situations. OHSO should be consulted whenever there is a question that cannot be answered by these guidelines.

1.4 Roles and Responsibilities

To successfully achieve UVM's goal of Academic Excellence, individual members of our campus community must understand their roles and accept responsibility as described in UVM policies and plans. Please use the resource of UVM's Safety websites to increase your personal awareness and minimize your risk for injury both on and off campus. These are summarized on the webpage Health and Safety Roles and Responsibilities | Environmental Health and Safety | The University of Vermont (uvm.edu).

We look to all members of the University community to do their part in helping to meet this goal.

1.4.1 Department Administration

1. Maintain and update Design Guidelines requiring that projects be designed according to current VOSHA standards and that hazard elimination, engineering controls, and administrative controls, for occupant use and maintenance work be designed into projects wherever feasible.
2. Provide administrative and financial support for this program within individual units.
3. Ensure that personal protective equipment (PPE) is provided and maintained within the department.
4. Support disciplinary action in the event that proper procedures are neglected and/or obviously not followed.

1.4.2 Department of Environmental Health and Safety

1. Designate and empower individuals who will act as competent and/or qualified person(s) who will be responsible for the preparation and implementation of this program.
2. Ensure that employees who will act as competent and/or qualified person(s) are adequately trained and/or qualified.
3. Ensure this program is implemented and maintained within departments.
4. Serves as the primary contact person for IAQ issues and concerns.
5. Conducts investigative efforts involving IAQ complaints and concerns, documents investigative efforts, and communicates with applicable building occupants and representatives concerning complaints and corrective actions.
6. Develops corrective recommendations, actions, and/or controls, and works collaboratively with the colleges and departments in their implementation.
7. Conducts training and education in the recognition, prevention, and resolution of IAQ related issues.
8. Consult with outside entities as needed.
9. Annual review and revision as necessary for this program to meet current state and federal regulations or industry guidelines.

1.4.3 UVM Department of Facilities Management

1. Responsible for day-to-day routine maintenance activities that could potentially impact IAQ.
2. Conducting appropriate preventative maintenance on equipment such as heating ventilation and air conditioning (HVAC) systems that could impact IAQ.
3. Assisting EHS with investigative efforts following reports of compromised IAQ as necessary.
4. Limiting the use of high VOC compounds in cleaning, painting, and maintenance activities.
5. Selecting appropriate cleaning equipment that minimize impacts to IAQ including utilizing vacuums equipped with High Efficiency Particulate Air (HEPA) filtration.
6. Reviewing cleaning materials on a routine basis and, where possible, replacing them with "green" brands that can improve IAQ.
7. Performing comprehensive cleaning in areas where suspected IAQ issues may be associated with overall cleanliness

1.4.4 UVM Project Managers/ Planning, Design and Construction (PDC)

1. Overseeing the proper installation of supply and exhaust air to buildings as part of construction/renovation projects.
2. Ensuring proper balancing of air supply and exhaust systems installed as part of new or renovated campus buildings/spaces.
3. Assisting EHS with investigative efforts following reports of compromised IAQ and with the development of corrective actions as necessary.
4. Ensuring that the proper use of materials, such as low VOC paint and adhesives, and proper construction practices are used to minimize impacts to finished and/or occupied areas during and following construction activities.
5. Communicating with building occupants regarding pending construction/renovation projects and potential impacts to IAQ.

1.4.5 UVM Department of Residential Life

1. Responding to student IAQ complaints and concerns in a timely manner and reporting such events to SOS and OHSO.
2. Assisting EHS with investigative efforts following reports of compromised IAQ and with the development of corrective actions as necessary.

1.4.6 UVM Managers and Supervisors

1. Responding to employee IAQ complaints and concerns in a timely manner and reporting such events to SOS and OHSO.
2. Coordinates building walk through assessments including initial building profiles and annual building reviews.
3. Coordinate the corrective actions required of hazards brought to their attention by employees.
4. Assisting EHS with investigative efforts following reports of compromised IAQ and with the development of corrective actions as necessary.
5. Complete a "First Report of Injury" or "Incident" report and produce any additional documentation needed to investigate and work-related injuries and illnesses.

1.4.7 UVM Personnel

1. Comply with this program and any further safety recommendations provided by the supervisor and/or Occupational Health and Safety Office.
2. Complete required training and request further instructions if unclear.
3. Conduct assigned tasks in a safe manner and wear all assigned PPE.
4. Report to a supervisor any new hazards, unsafe or unhealthy work conditions, and job-related injuries and illnesses to the supervisor immediately.

2.0 INFORMATION AND TRAINING

Information and training will be provided or arranged by the Occupational Health and Safety Office to any unit or individual requesting guidance or training to satisfy implementation of this program.

Prior to conducting work in response to a water intrusion event, employees must be trained to know:

- Basic IAQ concepts
- IAQ concerns and contaminants
- Mold awareness
- Proper PPE
- UVM Water Intrusion Response Program
- Preventative and corrective measures
- IAQ communication
- Common IAQ misconceptions

Please see UVM's Water Intrusion Response Program for additional training requirements that may be pertinent. Upon completion of the training, the employee must be able to demonstrate the above-mentioned information. Any type of training format can be used, as long as a hands-on portion is provided where necessary, such as PPE or equipment use.

Retraining will be required when it is believed an employee does not have the understanding and/or skill in response and communication in event of a water intrusion. Also, retraining may be required if the following occurs:

1. Changes in the workplace show previous training does not meet requirements,
2. Other indications that employee(s) inadequacies in knowledge or information have not been retained.

3.0 PREVENTION

Preventative maintenance plays a critical role in maintaining the quality of air by assuring building systems are operating effectively and efficiently, and that procedures are in place to minimize non-system impacts to IAQ. In addition, it helps to maintain comfortable temperature and humidity levels in occupied areas.

1. Indoor humidity should be below 60% relative humidity (RH), preferably at 30%-50% RH.
2. Regularly scheduled inspections of building components and HVAC systems should be performed.
3. Dry and clean wet or damp spots within 48 hours.
4. Promptly solve and eliminate water and moisture problems before additional hazards arise.

The following sections describe basic fundamental preventative measures that can be conducted to reduce potential risks to IAQ.

3.1 Housekeeping

Regular and thorough cleaning is an important means for the removal of air pollutant sources. However, the use of cleaning products may also contribute to indoor air pollution. To ensure that cleaning practices remove pollutants, or prevent additional pollutant sources, the following guidelines should be adhered to while using cleaning products, tools, and equipment:

1. Utilize cleaning agents that have been reviewed and approved for use. All containers must be clearly labeled, tightly closed, and stored in a secured location when not in use. Whenever possible, use cleaning products without added fragrances.
2. Vacuums should be equipped with high efficiency particulate air (HEPA) filtration and wet wiping techniques should be used to clean and control dust/particulate build up in indoor environments.
3. UVM Personnel should discuss with other occupants the use of any outside odor causing item that could impact IAQ. This would include discussions prior to utilizing personal air fresheners, incense, diffusers, or any other odor causing item.
4. Significant cleaning operations, such as carpet washing should be conducted when areas are scheduled to be unoccupied for extended periods, such as holiday breaks or during the summer for residential halls. Carpets should be thoroughly cleaned utilizing deep-water extraction and properly dried. Proper drying should include carpet drying fans and dehumidification.

3.2 Construction Activities

IAQ must be considered when planning construction and renovation projects. Renovation and construction activities can create many sources that can lead to compromised IAQ. To minimize potential impacts to occupants the following preventative measures can be implemented.

1. Project Managers should communicate with building occupants and ensure that construction areas in occupied buildings are isolated from the occupied areas. This can be achieved through the construction of temporary barriers or the use of plastic sheeting. In addition, areas can be placed under negative air pressure.
2. Ensure construction activities utilize methods to minimize dust and odors such as wet cutting of concrete and/or the use of low odor/low VOC paints and adhesives. Painting and drying, or any other construction tasks that require the use of chemical materials should occur during periods of low occupancy and with proper ventilation.

3.3 HVAC Systems

Preventative maintenance involves routine inspections, adjustments, and repair of building structures and systems that include HVAC systems, unit ventilators, local exhaust, and fresh air intakes. Preventative maintenance plays a major role in maintaining the quality of air by assuring that the building systems are operating effectively and efficiently.

4.0 REPORTABLE HAZARDS

Vermont State and federal regulations do not have general IAQ standards that cover all the numerous indoor air pollutants that can be spread through a building. There are guidelines addressing the most common workplace complaints related to IAQ. They typically fall into three basic categories: biological, chemical, and particle. If it is suspected or evidence of any of the following hazards, contact a supervisor and SOS.

Appendix D provides the most common reportable IAQ related workplace complaints.

5.0 RESPONSE AND COMMUNICATION

Prompt and effective communication between UVM Personnel is an essential component in IAQ response. The building occupants shall be notified in the affected area(s). Communication will be conducted via electronic correspondence (e-mail), written documentation, personal meetings, or group/open forum discussions. The form of communication will be determined based on the IAQ concern, its severity, and employees affected. Conditions shall determine if building occupants will need to be relocated during investigation or remediation activities.

OHSO, in collaboration with Facilities Management, and approved vendors, will manage and conduct the following activities:

1. Conduct or distribute occupant interview questionnaires and journals. IAQ Questionnaire is provided in *Appendix A*. IAQ Occupant Journal is provided in *Appendix B*.
2. Investigate potential source(s) of the IAQ complaint. IAQ Assessment Checklist is provided in *Appendix C*.
3. Confirm with zone manager or supervisor is notified and able to identify, alleviate or isolate the problem, or fix as soon as possible.
4. Notify all applicable building contacts as needed and communicate with the building occupants as appropriate addressing all concerns.
5. Data collection: baseline indoor air quality measurements (real time parameters: temperature, humidity, CO_2, CO, and others as determined by EHS).

The assessment will include observations to assess potential factors that could impact IAQ through. During an initial walk through, physical components that affect the air quality of functional spaces will be examined, including flooring or carpeting, walls, ceilings, furniture, air intakes and exhaust, entrances and exits, mechanical spaces, and roofs.

Identifying the cause(s) of IAQ problems and complaints may be difficult if an obvious source is not evident. Investigating unclear IAQ problems should take into account patterns and factors, such as occupant complaints and symptoms, location(s) in the building, time of day, seasonal differences, and relationship to activities inside or outside the building.

6.0 CORRECTIVE ACTIONS AND RESTORATION ACTIVITIES

The purpose of remediation is to remove the source and hazards to prevent occupational exposure and damage to building materials and furnishings. Remediation includes both the identification and correction of the conditions that permit unsafe work conditions and environment, as well as the steps to remove damaged materials safely and effectively.

Experienced professional judgement will determine if an approved vendor is required to conduct remediation activities.

6.1 Remediation

Following an assessment determining the source(s) to an IAQ concern, complaint, or other hazards, a remediation plan can be implemented. The remediation plan should include steps to permanently correct the problem. The plan should also cover the use of appropriate personal protective equipment (PPE) to be used.

Important – Prior to building materials being disturbed, removed, and disposed of, the EHS – Environmental Safety and Compliance Office (ESC) shall be consulted to confirm that building

materials are negative for asbestos. Please refer to UVM's Asbestos Management Program for more information.

A remediation plan should include steps to carefully alleviate the issue contain and remove any contaminated items and building materials in a manner that will prevent further contamination:

1. Do not eat or drink in the affected areas.
2. Do not run the HVAC system if you know or suspect that it is contaminated with mold or other hazards, as it could spread contamination throughout the building.
3. Remediators should avoid exposing themselves and others to dust or particulates as they conduct their cleanup activities.
4. When possible, remediation activities should be scheduled during off hours when building occupants are less likely to be affected.
5. Appropriate personnel will determine whether containment of the work area is required.
6. The work area and areas used by remediation workers for egress should be cleaned with a damp cloth or mop and a detergent solution and HEPA vacuumed.
7. All areas should be left dry and visibly free from contamination and debris.

6.2 Project Monitoring

OHSO, in collaboration with Facilities Management, and approved vendors, will perform project monitoring to include the following activities:

1. Document the extent of progress of the project.
2. Work areas shall be inspected at least once every twenty-four (24) hours.
3. A remediation project will be classified as complete when the following criteria have been met:
    a. The problem has been identified and addressed.
    b. Building materials, if applicable, have been repaired or replaced.
    c. Building occupants can safely reoccupy the areas.

6.3 Sampling

Experienced professional judgement and best industry standards should be utilized when testing for potential IAQ hazards. Additionally, sampling only provides "snapshot" information only for the moment in time in which the sampling occurred.

Sampling may be considered in specific instances, such as:

- Source(s) of contamination is unclear.
- Health concerns are evident or following a medical diagnosis.
- Cases where litigation is involved.
- Following a remediation project.

OHSO shall provide a sampling plan and oversight for the collection of samples. Sampling may consist of air samples, surface samples, and in some cases bulk or water samples. Experienced professional judgement by OHSO or a hired vendor will be considered in interpretation of analytical results from sampling.

7.0 PERSONAL PROTECTIVE EQUIPMENT

UVM Personnel shall utilize PPE during IAQ assessments and remediation to prevent contact with eyes or skin, inhalation, or ingestion of particulates and hazards agents, such as bacteria, viruses, mold spores and structures. For specific information on PPE guidelines, please see UVM's PPE Program.

8.0 RECORDKEEPING

8.1 Filed Complaints and Project Records

IAQ-related Work Orders in UVM's enterprise Integrated Work Management Software (IWMS) Planon are held and maintained by Facilities Management and OHSO.

EHS will retain all IAQ complaints, written descriptions, investigative reports, and exposure monitoring. The resolution of IAQ concerns must be documented and the impacted parties informed in writing of the corrective actions.

8.2 Training Records

Training records will be maintained within personnel training files within the department the UVM Personnel works in. Applicable training records can be filed and stored within OHSO.

The training record must include the date and time of training, name of trainer/instructor, and name of UVM Personnel.

Contact OHSO for more information on training requirements and scheduling.

University of Vermont

APPENDIX A

IAQ Occupant Questionnaire

Department of Environmental Health and Safety
Occupational Health and Safety Office
321 Ryan Street, Essex, Vermont 05452
ohealth@uvm.edu ● (802) 656-7233

IAQ Management Program

OCCUPANT INTERVIEW - INDOOR AIR QUALITY

EMPLOYEE INFORMATION

Name: Click or tap here to enter text.

NETID: Click or tap here to enter text.

Job Title: Click or tap here to enter text.

Email: Click or tap here to enter text.

SUPERVISOR INFORMATION

Name: Click or tap here to enter text.

NETID: Click or tap here to enter text.

Job Title: Click or tap here to enter text.

Email: Click or tap here to enter text.

Department: Click or tap here to enter text.

Department Contact Name (*if different from Supervisor*): Click or tap here to enter text.

Department Contact Email (*if different from Supervisor*): Click or tap here to enter text.

Is the source of the problem(s) identified? ☐ **Yes** ☐ **No**
If so, explain: Click or tap here to enter text.

BUILDING INFORMATION

Building Name: Click or tap here to enter text.

Address: Click or tap here to enter text.

Area of Concern (*describe*):
Click or tap here to enter text.

Room Function (*office, classroom, etc.*):
Click or tap here to enter text.

Floor Level: Click or tap here to enter text.

Room Number: Click or tap here to enter text.

SYMPTOMS PATTERNS

What kind of symptoms or discomfort are experiencing? Click or tap here to enter text.

Are you aware of other people with similar symptoms or concerns? ☐ Yes ☐ No

If yes, please provide names and work locations: Click or tap here to enter text.

Do you have any health conditions that may make you particularly susceptible to environmental problems?

☐ contact lenses ☐ chronic cardiovascular disease ☐ undergoing chemotherapy or radiation therapy

☐ allergies ☐ chronic respiratory disease ☐ immune system suppressed by disease or other causes

☐ prefer not to answer ☐ chronic neurological problems ☐ other (*specify*): Click or tap here to enter text.

TIMING PATTERNS

When did you first occupy the space? Click or tap here to enter text.

How long have you occupied the space (days, years)? Click or tap here to enter text.

When did your symptoms start? Click or tap here to enter text.

When are symptoms generally worst? Click or tap here to enter text.

Do symptoms go away or improve? ☐ Yes ☐ No If so, when? Click or tap here to enter text.

OCCUPANT INTERVIEW - INDOOR AIR QUALITY

Do you notice symptoms more after certain activities? ☐ Yes ☐ No If so, when? Click or tap here to enter text.

Have you noticed any other events (such as weather events, temperature or humidity changes, or activities in the building) that tend to occur around the same time as your symptoms?
Click or tap here to enter text.

SPATIAL PATTERNS

Where are you when you experience symptoms or discomfort?
Click or tap here to enter text.

Where do you spend most of your time in the building?
Click or tap here to enter text.

ADDITIONAL INFORMATION

Do you have any observations about building conditions that might need attention or might help explain your symptoms (e.g., temperature, humidity, drafts, stagnant air, odors)?
Click or tap here to enter text.

Have you sought medical attention for your symptoms?
Click or tap here to enter text.

Do you have any other comments?
Click or tap here to enter text.

APPENDIX B

IAQ Occupant Journal

Department of Environmental Health and Safety

IAQ Management Program

Occupational Health and Safety Office
321 Ryan Street, Essex, Vermont 05452
ohealth@uvm.edu ● (802) 656-7233

Risk Management
284 East Avenue, Burlington, Vermont 05405
risk.management@uvm.edu ● (802) 656-3242

OCCUPANT JOURNAL - INDOOR AIR QUALITY

Please record each occasion when you experience a symptom of ill-health or discomfort that you may think may be linked to an environmental condition in the building/facility. It is important that you record information accurately, because that will help to identify conditions (e.g., equipment, operation, etc.) that may be associated with an IAQ issue.

EMPLOYEE INFORMATION

Name: Click or tap here to enter text.

NETID: Click or tap here to enter text.

Job Title: Click or tap here to enter text.

Email: Click or tap here to enter text.

SUPERVISOR INFORMATION

Name: Click or tap here to enter text.

NETID: Click or tap here to enter text.

Job Title: Click or tap here to enter text.

Email: Click or tap here to enter text.

Department: Click or tap here to enter text.

Department Contact Name (*if different from Supervisor*): Click or tap here to enter text.

Department Contact Email (*if different from Supervisor*): Click or tap here to enter text.

BUILDING INFORMATION

Building Name: Click or tap here to enter text.

Address: Click or tap here to enter text.

Area of Concern (*describe*):
Click or tap here to enter text.

Room Function (*office, classroom, etc.*):
Click or tap here to enter text.

Floor Level: Click or tap here to enter text.

Room Number: Click or tap here to enter text.

ADDITIOANL INFORMATION

Click or tap here to enter text.

Department of Environmental Health and Safety
Occupational Health and Safety Office
321 Ryan Street, Essex, Vermont 05452
ohealth@uvm.edu ● (802) 656-7233

IAQ Management Program

OCCUPANT JOURNAL - INDOOR AIR QUALITY

	Date/Time	Location	Symptoms/Severity	Duration	Comments
Day 1	Click here to enter text.	Click here to enter text.	Click here to enter text.	Click here to enter text.	Click here to enter text.
Day 2	Click here to enter text.	Click here to enter text.	Click here to enter text.	Click here to enter text.	Click here to enter text.
Day 3	Click here to enter text.	Click here to enter text.	Click here to enter text.	Click here to enter text.	Click here to enter text.
Day 4	Click here to enter text.	Click here to enter text.	Click here to enter text.	Click here to enter text.	Click here to enter text.
Day 5	Click here to enter text.	Click here to enter text.	Click here to enter text.	Click here to enter text.	Click here to enter text.
Day 6	Click here to enter text.	Click here to enter text.	Click here to enter text.	Click here to enter text.	Click here to enter text.
Day 7	Click here to enter text.	Click here to enter text.	Click here to enter text.	Click here to enter text.	Click here to enter text.
Day 8	Click here to enter text.	Click here to enter text.	Click here to enter text.	Click here to enter text.	Click here to enter text.
Day 9	Click here to enter text.	Click here to enter text.	Click here to enter text.	Click here to enter text.	Click here to enter text.
Day 10	Click here to enter text.	Click here to enter text.	Click here to enter text.	Click here to enter text.	Click here to enter text.
Day 11	Click here to enter text.	Click here to enter text.	Click here to enter text.	Click here to enter text.	Click here to enter text.
Day 12	Click here to enter text.	Click here to enter text.	Click here to enter text.	Click here to enter text.	Click here to enter text.
Day 13	Click here to enter text.	Click here to enter text.	Click here to enter text.	Click here to enter text.	Click here to enter text.
Day 14	Click here to enter text.	Click here to enter text.	Click here to enter text.	Click here to enter text.	Click here to enter text.
Day 15	Click here to enter text.	Click here to enter text.	Click here to enter text.	Click here to enter text.	Click here to enter text.

Additional Comments:
Click here to enter text.

APPENDIX C

IAQ ASSESSMENT CHECKLIST

Department of Environmental Health and Safety

Occupational Health and Safety Office
321 Ryan Street, Essex, Vermont 05452
ohealth@uvm.edu ● (802) 656-7233

Risk Management
284 East Avenue, Burlington, Vermont 05405
risk.management@uvm.edu ● (802) 656-3242

IAQ Management Program

INDOOR AIR QUALITY ASSESSMENT CHECKLIST

For **EHS staff only**.

EMPLOYEE INFORMATION

Name: Click or tap here to enter text.

NETID: Click or tap here to enter text.

Job Title: Click or tap here to enter text.

Email: Click or tap here to enter text.

SUPERVISOR INFORMATION

Name: Click or tap here to enter text.

NETID: Click or tap here to enter text.

Job Title: Click or tap here to enter text.

Email: Click or tap here to enter text.

Department: Click or tap here to enter text.

Department Contact Name (*if different from Supervisor*): Click or tap here to enter text.

Department Contact Email (*if different from Supervisor*): Click or tap here to enter text.

Is the source of the problem(s) identified? ☐ **Yes** ☐ **No**
If so, explain: Click or tap here to enter text.

BUILDING INFORMATION

Building Name: Click or tap here to enter text.

Address: Click or tap here to enter text.

Construction Date: Click or tap here to enter text.

Area of Concern (*describe*):
Click or tap here to enter text.

Room Function (*office, classroom, etc.*):
Click or tap here to enter text.

Floor Level: Click or tap here to enter text.

Room Number: Click or tap here to enter text.

Floor Plans/Diagrams available? ☐ Yes ☐ No

HVAC INFORMATION

Type of HVAC System: Click or tap here to enter text.

Age of HVAC System: Click or tap here to enter text.

Last Service Date/Filter Change:
Click or tap here to enter text.

Locations of HVAC (intake, exhaust, etc.):
Click or tap here to enter text.

Any test and balance reports? ☐ Yes ☐ No

HOUSEKEEPING INFORMATION

How often is the office vacuumed? ☐ Yes ☐ No

How often are carpet and drapes shampooed? ☐ Yes ☐ No

How often are floors waxed? ☐ Yes ☐ No

Are there any visible signs of dust? ☐ Yes ☐ No

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risk.management@uvm.edu ● (802) 656-3242

INDOOR AIR QUALITY ASSESSMENT CHECKLIST

Have pesticides been applied recently?

ADDITIONAL INFORMATION

Occupant Interview Completed	☐ Yes	☐ No
Occupant Journal Completed	☐ Yes	☐ No
Number of Occupants in space: Click or tap here to enter text.		
Age or range of occupants: Click or tap here to enter text.		
Any recent renovations or new furnishings: Click or tap here to enter text.	☐ Yes	☐ No
Any construction activities in or adjacent to the space: Click or tap here to enter text.	☐ Yes	☐ No
Any known assessments done prior?	☐ Yes	☐ No
If so, reports available?	☐ Yes	☐ No
Any reported doctor visits or medical diagnosis?	☐ Yes	☐ No
Do you anticipate any legal issues involved?	☐ Yes	☐ No
Regularly scheduled maintenance of the building, HVAC system, etc. conducted by Facilities Management?	☐ Yes	☐ No
Any recent extreme weather or other extreme conditions that may have occurred? If so, explain: Click or tap here to enter text.	☐ Yes	☐ No
Any known building problems (structural damage, maintenance issues, previous fires, etc.)? If so, explain: Click or tap here to enter text.	☐ Yes	☐ No
Any known history water damage or intrusion (staining, leaks, mold)? If so, explain: Click or tap here to enter text.	☐ Yes	☐ No
Any known pest control issues? If so, explain: Click or tap here to enter text.	☐ Yes	☐ No
Have pesticides been applied recently?	☐ Yes	☐ No
Any chemicals used or stored in the space?	☐ Yes	☐ No
If so, are Safety Data Sheets (SDS) available?	☐ Yes	☐ No
Any perceived odor? If so, explain: Click or tap here to enter text.	☐ Yes	☐ No
Any plants in the space?	☐ Yes	☐ No
Any pets (dog, cat, aquariums, etc.) in the space? Type of animal(s): Click or tap here to enter text.	☐ Yes	☐ No
Any visible apparent mold growth?	☐ Yes	☐ No

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INDOOR AIR QUALITY ASSESSMENT CHECKLIST

WALK THROUGH INSPECTION

			Condition or Comments:
HVAC System	☐ Yes	☐ No	Click to enter text.
Changes to HVAC	☐ Yes	☐ No	Click to enter text.
Windows/Skylights	☐ Yes	☐ No	Click to enter text.
Doors	☐ Yes	☐ No	Click to enter text.
Overall Cleanliness	☐ Yes	☐ No	Click to enter text.
Outdoor Air Intakes	☐ Yes	☐ No	Click to enter text.
Exterior Walls	☐ Yes	☐ No	Click to enter text.
Furniture	☐ Yes	☐ No	Click to enter text.
Smoking	☐ Yes	☐ No	Click to enter text.
Visible Water Damage	☐ Yes	☐ No	Click to enter text.
Wall/Ceiling Coverings	☐ Yes	☐ No	Click to enter text.
Roof	☐ Yes	☐ No	Click to enter text.
Gutters	☐ Yes	☐ No	Click to enter text.
Foundation	☐ Yes	☐ No	Click to enter text.
Exterior Landscaping/ Grade (slope)	☐ Yes	☐ No	Click to enter text.

DATA COLLECTION

Real Time Parameters			Result or Comments:
Temperature (68˚F – 78˚F)	☐ Yes	☐ No	Click to enter text.
Relative Humidity (30%-60%)	☐ Yes	☐ No	Click to enter text.
Carbon Dioxide (CO_2)	☐ Yes	☐ No	Click to enter text.
Carbon Monoxide (CO)	☐ Yes	☐ No	Click to enter text.
Total Volatile Organic Compounds (TVOCs)	☐ Yes	☐ No	Click to enter text.
Particulate Matter ($PM_{2.5}$)	☐ Yes	☐ No	Click to enter text.
Particulate Matter (PM_{10})	☐ Yes	☐ No	Click to enter text.

Further Recommended Investigation/Sampling			
Formaldehyde (HCHO)	☐ Yes	☐ No	Click to enter text.
Nitrogen Dioxide (NO_2)	☐ Yes	☐ No	Click to enter text.
Ozone	☐ Yes	☐ No	Click to enter text.
Sulfur Dioxide	☐ Yes	☐ No	Click to enter text.
Air Movement	☐ Yes	☐ No	Click to enter text.
Mold	☐ Yes	☐ No	Click to enter text.
Bacteria	☐ Yes	☐ No	Click to enter text.
Radon	☐ Yes	☐ No	Click to enter text.
Lead	☐ Yes	☐ No	Click to enter text.
Asbestos	☐ Yes	☐ No	Click to enter text.
Other	☐ Yes	☐ No	Click to enter text.

APPENDIX D

COMMON REPORTED IAQ HAZARDS

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COMMON REPORTED INDOOR AIR QUALITY (IAQ) HAZARDS

Asbestos is a naturally occurring mineral fiber in rock and soil. Because of its fiber strength and heat resistance it has been used in manufacturing for a variety of materials.	Elevated concentrations of airborne asbestos can occur after asbestos-containing materials are disturbed by cutting, sanding or other remodeling activities. Improper attempts to remove these materials can release asbestos fibers into the air, increasing asbestos levels and endangering people.	Asbestos has been used in a wide range of manufactured goods, mostly in insulation, fire-retardant, building materials, friction products, heat/chemical-resistant components.
Carbon Dioxide (CO_2) is a colorless, odorless, and tasteless gas. It is a naturally occurring constituent of the atmosphere being a product of completed carbon combustion and is also a product of human respiration. At high enough concentrations it leads to an increased respiratory rate, tachycardia, cardiac arrhythmias and impaired consciousness.	Acceptable CO_2 concentrations in outdoor air typically range from 300-500 ppm (ASHRAE). Procedures for determining recommended outside air supply rates for occupied buildings are prescribed in the American Society of Heating, Refrigeration and Air-Conditioning Engineers (ASHRAE) Standard 62.1-2004, Ventilation for Acceptable Indoor Air Quality, which specifies minimum ventilation rates and indoor air quality that will be acceptable to human occupants and is intended to minimize the potential for adverse health effects.	High CO_2 levels may indicate a problem with overcrowding or inadequate outdoor air ventilation rates. During periods of occupancy, carbon dioxide levels in a building will typically rise above normal background levels. The level of increase of carbon dioxide concentrations is generally related to the number of individuals in an area and the amount of outside air being introduced into that area.
Carbon Monoxide (CO) is a colorless, odorless gas produced by the incomplete burning of material containing carbon. Employees exposed to low levels of CO may feel sick with headache and nausea and will feel better when exposed to fresh air outside.	CO Indoor carbon monoxide levels can be compared with the Vermont Occupational Safety and Health Administration (VOSHA) permissible exposure limit (PEL) of 35 ppm.	Common sources of CO are leaking vented combustion appliances, automobile exhaust, parking garages, etc. When not properly ventilated, emitted CO can build up.

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COMMON REPORTED INDOOR AIR QUALITY (IAQ) HAZARDS

Damp and Water Damaged Building Materials	Over time, if building materials remain damp or wet, the structural integrity of such components may become compromised. Additionally, damp or wet building components and furnishings may release chemicals indoors, such as volatile organic compounds. Various odors may result and worsen with time if impacted areas remain wet or damp.	
Formaldehyde (HCHO) is a chemical or substance, colorless, strong-smelling gas often found in aqueous (water based) solutions. It is a sensitizing agent that can cause an immune system response upon initial exposure. It is also a cancer hazard. Acute exposure is highly irritating to the eyes, nose, and throat and can make anyone exposed cough and wheeze. Subsequent exposure may cause severe allergic reactions of the skin, eyes and respiratory tract. Ingestion of formaldehyde can be fatal, and long-term exposure to low levels in the air or on the skin can cause asthma-like respiratory problems and skin irritation such as dermatitis and itching. Concentrations of 100 ppm are immediately dangerous to life and health (IDLH).	While the use of formaldehyde in new building products and materials has decreased, new products that contain formaldehyde can off gas creating the potential for impacting IAQ. Results of indoor air sampling for formaldehyde will be compared to the OSHA permissible exposure limit (PEL) in the workplace of 0.75 parts formaldehyde per million parts of air (0.75 ppm) measured as an 8-hour time-weighted average (TWA). The standard includes a second PEL in the form of a short-term exposure limit (STEL) of 2 ppm which is the maximum exposure allowed during a 15-minute period. The action level, which is the standard's trigger for increased industrial hygiene monitoring and initiation of worker medical surveillance is 0.5 ppm when calculated as an 8-hour TWA.	Formaldehyde is commonly used as a preservative in medical laboratories and mortuaries. Additionally it can be found in products such as adhesives in pressed wood, particle board, medium density fiberboard, plywood, textile treatments, finish coatings, and urea formaldehyde foam insulation. It is also used in rubber/latex manufacture, dye manufacture and use, laboratory fixatives (formalin solutions), disinfectants, and preservatives.
Hazardous Materials are any biological agent and other disease-causing agent which after release into the environment and upon exposure, ingestion, inhalation, or assimilation into any person...will or may reasonably be anticipated to cause death, disease, behavioral abnormalities, cancer, genetic mutation, physiological malfunctions...or physiological deformations in such persons or their offspring.	Hazardous materials It is important to handle hazardous materials according to manufacturers' guidelines. Wastes generated from hazardous materials use must be stored in proper containers in designated locations.	The presence of hazardous building materials, such as lead and asbestos, typically do not pose a risk to building occupants unless they become damaged during maintenance operations or as part of construction/renovation activities.

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Mold is a type of fungi that is naturally occurring and can be found in various indoor and outdoor environments year-round. Contact and inhalation of structural members, spores, proteins, enzymes, and mycotoxins from mold can cause various health effects.	If mold is introduced to an indoor environment and left unchecked, mold gradually causes building material and structural damage, damage to furnishings, and impacts indoor air quality (IAQ). Potential health concerns are important reasons to prevent mold growth and remediate existing areas impacted by mold growth. Even dead mold can cause adverse health effects.	
Odors that are unusual or obnoxious may indicate an indoor air quality issue or hazard.	Adjacent rooms and floors should be inspected to help determine if the problem is limited to one area or is throughout the building. Building occupants should be interviewed to see if any work or other activities can identify the route cause.	Common sources include cleaning products, various chemicals, personal fragrances, rotting food, sink and floor drains, and construction activities.
Other Biological Hazards such as bacteria, viruses, and pathogens introduced to the work environment can contribute significantly to indoor air pollution.	It is critical that these hazards be reported immediately, and corrective action implemented as soon as possible to prevent further contamination or potential health risks.	
Pesticides are any substances or mixture of substances used for preventing, destroying, repelling, or mitigating any pest.	These substances include insecticides, herbicides, fungicides, and various other substances used to control pests. Pesticides can cause harm to humans, animals, and the environment because they are designed to kill or otherwise adversely affect living organisms. Pesticides can also kill potential disease-causing organisms.	
Pests	Damp building materials and furnishings may attract rodents and other pests, such as dust mites and cockroaches. Many pests can cause further damage to building materials and furnishings. Additionally, pests can introduce physical and biological hazards within the indoor environment.	

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COMMON REPORTED INDOOR AIR QUALITY (IAQ) HAZARDS

Radon is a colorless, odorless, and tasteless radioactive gas. It comes from the natural decay of uranium and some other radionuclides that are present in soil.	Radon testing should be conducted in those buildings following the completion of major renovations or new construction. Sampling results will be compared to the United States Environmental Protection Agency (US EPA) and maximum interior value of 4.0 picocuries per liter of air (pCi/L).	Radon gas can accumulate in buildings, such as crawl spaces and basements.
Temperature/Relative Humidity (%RH) are important because thermal comfort underlies many complaints about "poor air quality."	Indoor temperature and relative humidity can be compared to the American Society of Heating, Refrigerating and Air Conditioning Engineers (ASHRAE) Standard 55-2004. ASHRAE standard 55-2004 (Thermal Environmental Conditions for Human Occupancy) generally defines methods for determining acceptable indoor temperature ranges based on the level of human occupant activity (i.e., metabolic rate), occupant clothing insulation, ambient humidity, and other factors. The intent of the standard is to provide acceptable thermal comfort for a desired percentage of building occupants.	Extreme temperatures and relative humidity can create a hazardous work environment increasing the risk of injury or illness. The type of work, the local working conditions, and an individual's personal response should be considered when working in extreme temperatures.
Volatile Organic Compounds (VOCs) refer to organic chemical compounds that have significant vapor pressures, and that can adversely affect the environment and human health. The composition of VOCs makes it possible for them to evaporate under normal indoor atmospheric conditions of temperature and pressure. VOCs are emitted by a wide array of products numbering in the thousands		Examples include paints and lacquers, paint strippers, cleaning supplies, pesticides, building materials and furnishings, office equipment such as copiers and printers, correction fluids and carbonless copy paper, and graphics and craft materials, including glues and adhesives, permanent markers, and photographic solutions. More commonly known VOCs include benzene, formaldehyde, methylene chloride, trichloroethylene, and tetrachloroethylene. In offices, VOCs result from new furnishings, wall coverings, and office equipment such as photocopy machines, which can off gas VOCs into the air. Good ventilation and air-conditioning systems are essential to reduce VOC emissions in the indoor environment.