



MOLD REMEDIATION Instructor Guide

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Midwest Consortium for Hazardous Waste Worker Training

Acknowledgments

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Warning

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Disclaimer

There is currently no Occupational Safety and Health Administration (OSHA) regulation specifically regarding mold remediation. Some applicable regulations are: OSHA's Hand Protection Standard (29 CFR 1910.138), Eye and Face Protection Standard (29 CFR 1910.133), Respiratory Protection Standard (29 CFR 1910.134), and Personal Protective Equipment General Requirements (29 CFR 1910.132).

Additional training is necessary to perform many activities. These activities include implementing the emergency response plan, identifying specific molds and associated health hazards, selecting protective equipment, and performing advanced control containment or confinement. Additional site-specific training for emergency response must be provided so that you understand how to recognize and respond to alarms at the site and can carry out any role which may be assigned during a response.

For information about further training, consult the training instructor, your company safety and health plan, or your company health and safety representative.

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Preface

Trainees are here because they are or will be employed as mold remediation workers. During this program they will learn about the following topics:

- Mold-specific health and safety hazards.
- Use of personal protective equipment.
- Work practices and other controls to minimize hazards.
- Decontamination
- Other resources.

When they finish, they will be better able to do the following:

- Recognize mold-related hazards.
- Conduct safe work practices.
- Use protective equipment.
- Perform necessary decontamination.

INSTRUCTOR PREPARATION

The course incorporates a variety of teaching methods to meet varied learning styles. Discussions and small-group activities/exercises are used to present material. The Instructor Guide provides step-by-step instructions for presenting the material. Each chapter of the Instructor Guide includes information such as time requirements, teaching methods, required materials, suggested instructor preparation, minimum content requirements, issues which may arise, and reference materials. Every instructor should be familiar with the material in the entire Student Manual, the Instructor Guide, and the content he/she is teaching. In addition, the instructors should be familiar with the OSHA Standard 29 CFR 1910.120, and local mold cleanup rules and procedures. It is expected that participants will have completed the 40 hour site worker program.

Carefully review the section(s) of the Instructor's Guide which correspond to the topics you are teaching.

An emergency response plan must be in place for this program (see Appendix A) and known to all instructors.

Graphics/Audiovisuals

Graphics are available and should be referenced to assist with in-class instruction. Throughout the Student Manual are illustrations of mold damage, mold cleanup operations, respiratory protective equipment, and protective clothing. Refer trainees to these illustrations. PowerPoint slides should be limited to those which support lesson presentation. Avoid using one-word slides, slides with term definitions, and slides as lecture outlines. These types of presentations are not effective at keeping trainee attention. Effective slides refer directly to the scenario or answers developed by the small groups.

Qualifications for Trainers in the Mold Remediation Simulation

Four or more instructors are needed for the Mold Remediation Simulation (1 lead; 3 or more assistants). All personnel must be medically certified for respiratory protection and unrestricted physical activity. At least one instructor must be certified in First Aid and CPR (if EMS on site, this requirement can be waived). Specialized training in heat stress related illnesses is recommended.

The lead trainer must have successfully completed formal, documented training or otherwise possess the skills, ability, and knowledge gained through actual experience to recognize the use of and to anticipate the problems in the use of personal protective equipment and respiratory protection.

Personal work experience in the use of PPE is recommended. The lead trainer should have prior experience in training personnel in the use and decontamination of personal protective equipment. All trainers must have a working knowledge of the Emergency Response Plan.

Presentation of Material

This program is developed to be presented completely as exercises and discussion. Instructors do not need to lecture; rather the material that accompanies the exercise is provided as a resource. The instructor's role is to facilitate and assure that questions are answered. The Lesson Plan Format may be useful as a checklist for the instructor to assure that key points are covered during the exercise and discussion.

Each day should begin and end with at least 10 minutes of review. Reinforce key points and objectives. As manual chapters are covered, refer trainees to the "Key Terms" and "Review Questions" pages. Outlines in this guide for each chapter highlight main topics in the Student Manual. These outlines show the minimum content to be covered.

Small-Group Activities and Exercises

Small-group activities and exercises are the basis of this training course. Exercises are outlined in the Student Manual as well as in the Instructor's Guide. Activities are outlined in the Instructor's Guide only with instructions for presentation. The purpose of these activities and exercises is to experimentally involve trainees in clarifying information, identifying options, and applying skills. Be sure to allow sufficient time for trainees to complete activities.

Begin the course by splitting up the trainees into groups of two to four people. For an icebreaker, have the trainees introduce themselves within their group. When they introduce themselves, have them relate a situation that involved mold in their homes or at their work. What happened? How did they respond? What do they hope this course will teach them about proper mold remediation practices?

Assume that every class will have participants with a wide range of communication skills. Some trainees will have no problem participating in group discussion, while others may have difficulty speaking before the group.

Class activities and exercises enhance the learning process; therefore, it is strongly recommended that you make the atmosphere of the course activities and discussions comfortable so that all can participate. To make the course comfortable:

- Allow trainees to express their values, attitudes, and opinions freely.
- Do not judge trainees' responses.
- Facilitate discussion by paraphrasing and clarifying. It is seldom appropriate for the instructor to give opinions.
- Avoid putting people on the spot. Instead of asking individuals for answers, have a voluntary group spokesperson present answers to the class.
- Keep the groups focused on the task at hand. Because small-group activities and exercises will draw heavily on trainees' personal experience, sometimes one person can dominate the group. If this happens, steer the discussion back on track by asking another group for reactions.
- Keep the trainees alert and interested by encouraging participation. If the groups are not participating or if they are giving only cursory answers, ask the groups probing questions about their answers to make them be more specific.

Simulation

The simulation is designed to give trainees hands-on experience using equipment while reinforcing theoretical aspects learned in class discussions and fine-tuning what they practiced in the exercises. Performance checklists are completed by the trainee during the simulation. At the end of each exercise in the simulation, performance checklists must be signed by the instructor, collected, and retained by the training center as part of the trainee's permanent records.

Opening the Course

Refer to Participant Guide, Introduction Pages and Table of Contents.

- Have several 40-Hour Site Worker Manuals out as a reference and for trainees to review.
- Give overview of Acknowledgements, Warning, and Disclaimer.
- Go over Preface with students. Make sure they understand the overall objectives of the course.
- Have everyone introduce themselves and describe experience so you can better tailor the program. Some sections may be review for participants. Remember, know your audience.
- Pass out a copy of the agenda (next page). There is no copy of the agenda in the Participant's Manual. The Instructor's Manual is set up to reflect this agenda. This agenda can be adjusted by the instructor, if needed.
- Go over the Table of Contents so students have a general idea of what they will be learning in the next few days.

Chat with the trainees. Ask them questions about their training and work history.

- How long ago did you take the 40-Hour Site Worker? 8-Hour Site Worker Refresher?
- Did you take these, or any other courses with the Midwest Consortium?
- Where are you working now? In the past?
- Have you done any hazardous waste site work or mold remediation work before?

Most participants will have completed the 40-hour site worker program or be trained in asbestos abatement. Prior to work, each must be medically cleared to wear a respirator and fit-tested.

Proposed Agenda

This agenda is flexible and may be adjusted by the instructor to the needs of the class.

Day One:

- Introduction
- Planning
- Personal Protective Equipment
- Work Practices
- Decontamination

Day Two:

- Simulation (8:00 AM – 10:20 AM)
- Snack/Break (10:20 AM – 10:40 AM)
- Finish Simulation (10:40 AM – 12:00 PM)
- Discussion & Critique of Simulation Exercise (12:00 PM – 2:00 PM)

INTRODUCTION

Refer to Participant Guide, pages 9-18.

This chapter introduces the concept of mold to participants. It contains a basic definition of mold, as well as information about mold reproduction and likely locations and conditions that mold grows in.

Minimum Content Requirements

The following are minimum content requirements for the Introduction chapter:

- How is a mold problem detected?
- Mold can cause health problems.
- Mold growth is usually a direct result of moisture.
- Why take action?
- **Exercise: Mold in a School**

Teaching Methods

- Discussion
- Exercise

Reference Materials

- Ruther, Paul. “Parents and Teachers Shut Down Moldy New School.” *Everyone’s Backyard*. Vol. 20, No. 4. Winter 2002: 5-7.
- NYC Department of Health. “Fungi in Indoor Environments.” <http://www.nyc.gov/html/doh/html/epi/moldrpt1.shtml>. Accessed 4/12/07.

Questions You May Be Asked

- What is a colony?
 - A visible growth of mold.

Audio Visuals

- Projector
- Flipchart & markers
- Blue painter’s tape (can use to attach pages to wall)
- Moisture meter, if available
- List all the relevant slides/graphics that are part of the program

Special Space Requirements

- Meeting area for small groups

Suggested Instructor Preparation

- Review reference materials
- Review this section
- Prepare slide with answers to exercise
- Prepare slide with answers to review questions

Answers to Mold in a School Exercise

Have students read the exercise on pages 15-16 in the Participant Guide and then answer the questions that follow.

1. What were the initial clues that suggested the presence of mold contamination?

The moldy, musty odor that building occupants reported.
Mold present on the library's new books.

2. What caused the mold contamination and how did it spread?

The HVAC system was leaking, which provided the moisture needed for mold growth. The HVAC system then distributed mold spores throughout the building, so that the entire building became contaminated.

3. What health problems were caused by exposure to the mold?

Itchy red eyes.
Chronic cough.
Nausea.
Uncontrollable bronchial spasms.

4. What laws could the parents use to require the school to remove the mold?

This requires knowledge of local regulations. There may not be any. Generally, public opinion will result in action when children are involved, in the absence of legal requirements.

Answers to Review Questions

Have participants complete the review questions section on page 18 in the Participant Guide. This may be done as a group or in small groups.

Answers:

1. Define the term “mold”. (See pg. 5.)

“Mold” is the word often used to describe growth on surfaces after they have become wet with water or sewage. This is a general term for a large group of organisms. Yeasts, mildew, puffballs, toadstools, mushrooms, organic rusts, and molds as a group are referred to as fungi. This group constitutes 25% of all the living matter on earth. Fungi grow and multiply by feeding on living organisms or decaying organic matter including: paper, wood, wallpaper, and some adhesives.

2. List three clues that mold may be growing in a room. (See pgs. 7-8.)

Visible signs: darkened wallboard, fuzziness on upholstered surfaces.
Water damage: discolored ceiling tiles, standing water, condensation between panes of glass, condensation on pipes.
Odors: musty, moldy odors; dirty socks; stale, damp spaces.

3. List three possible health effects from exposure to mold. (See pgs. 8-9.)

Allergic reactions: itchy, watery eyes; cough; asthma attack.
Reaction to mycotoxins.
Organic Dust Toxic Syndrome (ODTS).
Hypersensitivity Pneumonitis (HP)

4. List three reasons to remediate mold. (See pgs. 10-11.)

Mold can cause health effects.
Mold can damage property.
Liability may result.
State and local requirements.

Checklist: Introduction

- | | | |
|---|------------------------------|-----------------------------|
| 1. Mold in a School Exercise Completed | Yes <input type="checkbox"/> | No <input type="checkbox"/> |
| 2. Review Questions Completed | Yes <input type="checkbox"/> | No <input type="checkbox"/> |

PLANNING

Refer to Participant Guide, pages 19-26.

This chapter outlines the four phases of the remediation process: Initial Investigation, Develop a Plan, Remediate/Re-evaluate, and Follow-Up. Participants will learn to identify types of mold remediation responses and identify the job duties of workers, supervisors, and owners in mold remediation.

Minimum Content Requirements

The following are minimum content requirements for the Planning chapter:

- Types of responses.
- The four phases of mold remediation.
- **Exercise: Job Duties**

Teaching Methods

- Discussion
- Exercise

Reference Materials

- Kansas State University. “Controlling Mold Growth in the Home.” <http://www.oznet.k-state.edu/library/hous2/mf2141.pdf>. Accessed 4/12/07.
- EPA. 402-K-01-001. *Mold Remediation in Schools and Commercial Buildings*. March 2001. <http://www.epa.gov/mold/pdfs/moldremediation.pdf>. Accessed 4/12/07.
- EPA. *A Brief Guide to Mold, Moisture, and Your Home*. <http://www.epa.gov/mold/moldguide.html>. Accessed 4/23/07.

Questions You May Be Asked

- Why all this planning? My boss just tells us to go in and get the job done.
 - Serious health effects can result from mold exposure. Also, proper work practices will reduce injury and follow up will reduce the potential for continued mold growth. Planning is essential to full remediation.
- Who performs investigations, since there is little in the way of certification in this field?
 - Usually, a certified mycologist or a certified mold inspector.
- Who certifies the mold inspector?
 - Generally, this is done by the State. Regulations vary from state to state.

Audio Visuals

- Projector
- Flipchart & markers
- Blue painter’s tape (can use to attach pages to wall)
- List all the relevant slides/graphics that are part of the program

Special Space Requirements

- Meeting area for small groups

Suggested Instructor Preparation

- Review reference materials
- Review this section
- Prepare slides with answers to exercise
- Prepare slides with answers to review questions

Answers to Job Duties Exercise

Have students review the EPA *Mold Remediation – Key Steps* figure and answer the questions on page 24 in the Participant Guide.

1. Which of the duties listed should the owner be responsible for?

- Consult health professional as appropriate throughout process.
- Select remediation manager.
- Check for return of moisture and mold problem.
- Communicate with building occupants throughout the process as appropriate to situation.

2. Which of the duties listed should the supervisor be responsible for?

- Assess size of problem and note type of mold-damaged materials.
- Plan remediation, adapt guidelines to fit situation.
- Identify source or cause of water or moisture problem.
- Select personal protective equipment (PPE).
- Select containment equipment.
- Select remediation personnel or team.
- Hidden mold discovered, re-evaluate plan.

3. Which of the duties listed should the workers be responsible for?

- Remediate.
- Clean and dry moldy items.
- Discard moldy items that can't be cleaned.
- Dry non-moldy items within 48 hours.
- Fix water or moisture problem (if adequately trained, otherwise, owner finds contractor).

Answers to Review Questions

Have students complete the review questions section on page 26 in the Participant Guide.

Answers:

1. List three actions that may result from an investigation about possible mold. (See pg. 16.)

No remediation action.
Small-scale maintenance job.
Remediation action.

2. What are the four phases of remediation? (See pg. 17.)

Phase 1: Initial Investigation
Phase 2: Develop a Plan
Phase 3: Remediate/Re-evaluate
Phase 4: Follow-Up

3. What is your role in each phase of the remediation? (See pg. 18.)

Depends on who is in the class. Could have both supervisors and workers.

Checklist: Planning

- | | | |
|---|------------------------------|-----------------------------|
| 1. Job Duties Exercise Completed | Yes <input type="checkbox"/> | No <input type="checkbox"/> |
| 2. Review Questions Completed | Yes <input type="checkbox"/> | No <input type="checkbox"/> |

PERSONAL PROTECTIVE EQUIPMENT / CHEMICAL PROTECTIVE CLOTHING

Refer to Participant Guide, pages 27-56.

Since exposure to mold can result in serious health effects, mold remediation workers should wear PPE/CPC to protect themselves. This chapter introduces participants to different kinds of respirators and protective clothing. Participants will learn to properly don, doff, and care for PPE/CPC.

Minimum Content Requirements

The following are minimum content requirements for the PPE/CPC chapter:

- Respiratory protection.
- **Exercise: Inspecting Respirators.**
- Types of Chemical Protective Clothing (CPC).
- **Exercise: Donning and Doffing PPE.**
- **Exercise: Cleaning, Storing, and Disposal of PPE.**
- **Exercise: What Would You Do?**
- **Exercise: Safe Work Practices**

Teaching Methods

- Discussion
- Exercise

Reference Materials

- CDC. “Guidance for the Selection and Use of Personal Protective Equipment (PPE) in Healthcare Settings.”
<http://www.cdc.gov/ncidod/dhqp/pdf/ppe/PPEslides6-29-04.pdf>. Accessed 4/8/07.
- EPA. 402-K-01-001. *Mold Remediation in Schools and Commercial Buildings*. March 2001. <http://www.epa.gov/mold/pdfs/moldremediation.pdf>. Accessed 4/12/07.
- Laborers-AGC Education and Training Fund. *Microbial Remediation*. June 2003.
- OSHA. *Respiratory Protection Standard 29 CFR 1910.134*.
http://www.osha.gov/pls/oshaweb/owadisp.show_document?p_table=STANDARDS&p_id=12716. Accessed 4/22/07.
- OSHA. *Eye and Face Protection Standard 29 CFR 1910.133*.
http://www.osha.gov/pls/oshaweb/owadisp.show_document?p_table=STANDARDS&p_id=9778. Accessed 4/22/07.
- OSHA. *Eye and Face e-Tool*.
<http://www.osha.gov/SLTC/etools/eyeandface/faqs.html>. Accessed 4/22/07.
- OSHA. *Hand Protection Standard 29 CFR 1910.138*.
http://www.osha.gov/pls/oshaweb/owadisp.show_document?p_table=STANDARDS&p_id=9788. Accessed 6/25/07.
- OSHA. *Personal Protective Equipment General Requirements 29 CFR 1910.132*.
http://www.osha.gov/pls/oshaweb/owadisp.show_document?p_table=STANDARDS&p_id=9777. Accessed 6/25/07.

Questions You May Be Asked

- What is NIOSH-approval?
 - For testing procedures, visit:
http://www.cdc.gov/niosh/npptl/stps/respirator_testing.htm
- Does NIOSH approve CPC?
 - No.
- About facial hair. Refer to Participant Guide, pg. 40. Also, note that after menopause, some women may have enough facial hair to cause problems creating a good seal with an APR.

Audio Visuals

- Projector
- Flipchart & markers
- Blue painter's tape (can use to attach pages to wall)
- List all the relevant slides/graphics that are part of the program

Special Space Requirements

- Meeting area for small groups

Suggested Instructor Preparation

- Review reference materials
- Review this section
- Prepare slides with answers to exercises
- Prepare slides with answers to review questions
- Read up on FIFRA, the Federal Insecticide, Fungicide, and Rodenticide Act. Biocides, such as bleach, which may be used in mold remediation are covered under this regulation. Biocides must be approved before application. See <http://www.epa.gov/pesticides/factsheets/chemicals/bleachfactsheet.htm> for more information.

Instructions for Inspecting Respirators Exercise

See page 41 of the Participant Guide.

Materials:

- Several undamaged single-use respirators
- Several single-use respirators that you have altered to be defective
- Several undamaged respirators with reusable elastomeric face pieces
- Several respirators with reusable elastomeric face pieces that you have altered to be defective

Instructions:

- Divide participants into groups.
- Pass out materials.
- Have participants inspect, disassemble, and assemble respirators.
- Assist as needed.

- Have participants fill out the worksheet & be sure to list defects.

Instructions for Donning and Doffing PPE Exercise

See page 48 of the Participant Guide.

Materials:

- N95 respirators
- Half-face APRs
- Full-face APRs
- Head covers
- Gloves
- Goggles
- Boot covers
- Full-body protective suits

Instructions:

- Divide participants into groups.
- Pass out materials.
- Have participants select ensembles for maximum, intermediate, and low levels of protection.
- Ensure that at least one group member dresses out for each of the three levels.
- Assist as needed.
- Have participants fill out the worksheet.

Participants should select the following ensembles for each level:

- **Lowest Level:** Gloves, N-95 respirator, goggles/eye protection
- **Intermediate Level:** Gloves, N-95 respirator or half-face respirator with HEPA filter, disposable overalls, goggles/eye protection
- **Maximum Level:** Gloves, disposable full body clothing head gear, foot coverings, full-face respirator with HEPA filter.

Instructions for Cleaning, Storing and Disposal of PPE Exercise

See page 49 of the Participant Guide.

- Divide participants into groups.
- Have participants fill out the worksheet.
- Assist as needed.

Expected Answers:

- | | |
|------------------------|---------------|
| • Gloves | Disposal |
| • Goggles | Clean & Store |
| • Head cover | Disposal |
| • Boot cover | Disposal |
| • Protective suit | Disposal |
| • N-95 | Disposal |
| • Half-face respirator | Clean & Store |
| • Full-face respirator | Clean & Store |

Answers to What Would You Do? Exercise

Have participants read pages 51-53 in the Participant Guide and fill out the worksheets.

For each scenario, sample answers are shown below:

1. You should select the following PPE:

- Gloves
- Full-face respirator w/ HEPA filter
- Disposable full-body clothing
- Head gear
- Foot coverings

Needs to be remediated: Focus on ceilings and walls, floor of 2nd floor.

Methods used:

- Contain the area
- Clean and dry moldy materials
- Wet wipe
- Vacuum
- Pressure wash
- Discard moldy items that cannot be cleaned
- Dry non-moldy items
- Fix water or moisture source

Containment = necessary. Full containment.

2. You should select the following PPE:

- Gloves
- Half-face respirator w/ HEPA filter
- Goggles
- Disposable full-body clothing
- Head gear
- Foot coverings

Needs to be remediated: Drywall, 2x4s.

Methods used:

- Contain the area
- Clean and dry moldy materials
- Wet wipe
- Vacuum
- Pressure wash
- Discard moldy items that cannot be cleaned
- Dry non-moldy items
- Fix water or moisture source

Containment = necessary. Limited containment.

3. You should select the following PPE:

- Gloves
- N-95 respirator
- Disposable full-body clothing
- Head gear
- Foot coverings

Needs to be remediated: Refrigerator, floor, base of wall, baseboards.

Methods used:

- Clean and dry moldy materials
- Wet wipe
- Vacuum
- Discard moldy items that cannot be cleaned
- Dry non-moldy items
- Fix water or moisture source

Containment = unnecessary.

Answers to Review Questions

Have students complete the review questions section on page 55 in the Participant Guide.

Answers:

1. List three types of respirators that may be used during mold remediation. (See pg. 24.)
 - Single-use (N-95)
 - Half-face respirator w/ HEPA filter
 - Full-face respirator w/ HEPA filter

2. List five of the seven elements OSHA requires as part of a respirator program. (See pg. 37.)
 - Medical evaluations of employees required to use respirators.
 - Fit testing procedures for tight-fitting respirators.
 - Procedures for proper use of respirators in routine and reasonably foreseeable emergency situations.
 - Procedures and schedules for cleaning, disinfecting, storing, inspecting, repairing, discarding, and otherwise maintaining respirators.
 - Training of employees in the respiratory hazards to which they are potentially exposed during routine and emergency situations.
 - Training of employees in the proper use of respirators, including putting on and removing them, any limitations on their use, and their maintenance.
 - Procedures for regularly evaluating the effectiveness of the program.

3. List three topics that must be included in training for use of gloves, eye protection, and protective clothing. (See pg. 39.)
 - Use
 - Limitations
 - Care

Checklist: PPE/CPC

- | | | |
|--|------------------------------|-----------------------------|
| 1. Inspecting Respirators Exercise Completed | Yes <input type="checkbox"/> | No <input type="checkbox"/> |
| 2. Donning and Doffing PPE Exercise Completed | Yes <input type="checkbox"/> | No <input type="checkbox"/> |
| 3. Cleaning, Storing, and Disposing of PPE
Exercise Completed | Yes <input type="checkbox"/> | No <input type="checkbox"/> |
| 4. What Would You Do? Exercise Completed | Yes <input type="checkbox"/> | No <input type="checkbox"/> |
| 5. Review Questions Completed | Yes <input type="checkbox"/> | No <input type="checkbox"/> |

WORK PRACTICES

Refer to Participant Guide, pages 57-93.

In this chapter, participants will learn to identify and demonstrate safe work practices.

Minimum Content Requirements

The following are minimum content requirements for the Work Practices chapter:

- Safe Work Practices
- **Exercise: Containment**
- **Exercise: Wet Vacuuming**
- **Exercise: Wet Wipe**
- **Exercise: HEPA Vacuuming**
- **Exercise: Disposal of Solid Debris**
- **Exercise: Unexpected Situations**

Teaching Methods

- Discussion
- Exercise

Reference Materials

- Environmental Management Institute. *Mold Remediation Supervisor Training*. 2006.
- NIOSH. “Interim Recommendations for the Cleaning and Remediation of Flood-Contaminated HVAC Systems: A Guide for Building Owners and Managers.” <http://www.cdc.gov/niosh/topics/flood/Cleaning-Flood-HVAC.html>. Accessed 4/13/07.
- “How to Troubleshoot a Central Air Conditioning System.” <http://home.howstuffworks.com/how-to-maintain-an-air-conditioner.htm> Accessed 4/11/07.
- EPA. 402-K-01-001. *Mold Remediation in Schools and Commercial Buildings*. March 2001. <http://www.epa.gov/mold/pdfs/moldremediation.pdf>. Accessed 4/12/07.
- Laborers-AGC Education and Training Fund. *Microbial Remediation*. June 2003.
- ANSI/ASHRAE 52.2 – 1999. *Method of Testing General Ventilation Air Cleaning Devices for Removal Efficiency by Particle Size*.
- OSHA e-Tool: Ladder Safety. <http://www.osha.gov/SLTC/etools/construction/falls/4ladders.html>. Accessed 6/19/07.

Questions You May Be Asked

- How often do HEPA filters have to be changed?
 - See instructions with the unit; consult supervisor.

Audio Visuals

- Projector
- Flipchart & markers
- Blue painter’s tape (can use to attach pages to wall)
- List all the relevant slides/graphics that are part of the program

Special Space Requirements

- Meeting area for small groups

Suggested Instructor Preparation

- Review reference materials
- Review this section
- Prepare slides with answers to review questions

Instructions for Containment Exercise

See page 82 of the Participant Guide.

Materials:

- Poly sheeting
- Spray adhesive
- Duct tape
- Furring strips
- Staple gun/nails

Instructions:

- Divide participants into groups.
- Pass out materials.
- Guide participants through Trainee Actions (listed below).
- Assist as needed.
- Have participants fill out the worksheet.

Trainee Actions:

- Turn off power at the source. Lock out/tag out.
- Remove furniture & light fixtures from room.
- In real life, these should be HEPA vacuumed & wet wiped before removing. Skip this for now.
- If items cannot be removed, they should be dried and covered in plastic.
- In real life, the entire room should then be HEPA vacuumed. Skip this for now.
- Seal all vents, windows, and extra doors with two layers of 6-mil poly and duct tape.
 - There should be only one entrance to the work area.
 - Overlap the tape.
 - Extend the poly 4 to 6 inches past the frame of vents, windows, and doors.
 - The first layer must not be removed until the room has passed inspection.
- Floors

- Cover floors with several layers of poly that are glued together with spray adhesive. This will guard against wear and tear.
- Be aware of possible fumes from the spray adhesive. Read the label carefully.
- Cover any seams in the floor layer with duct tape.
- The floor covering should extend 24 inches up the wall.
- Walls
 - Cover uncontaminated walls with a single layer of poly.
 - Cover all seams with duct tape.
- Floors
 - Put a second layer of poly on the floors using duct tape and spray adhesive.
 - The edges of this layer should extend up the wall a few inches past the first layer.
 - Seams of the second layer should be offset from the first layer.
- Walls
 - Put a second layer of poly on uncontaminated walls.
- Ceiling
 - Put a layer of poly on the ceiling and secure with duct tape and furring strips.
- Create a doorway/airlock
 - Cover the doorway with a sheet of 6-mil poly, extending the edges of the poly 4-6 inches past the frame.
 - Duct tape the edges down, overlapping the ends of the tape.
 - Cut a slit in the center of the poly.
 - Tape a second sheet of poly on one side of the doorway, with tape extending along the top of the poly and on the left-hand side (when facing doorway).
 - Move to the other side of the doorway.
 - Tape a third sheet of poly on one side of the doorway, with tape extending along the top of the poly and the right-hand side (when facing doorway).
 - This will create an S-shaped entryway.

Review:

- As the instructor, you should make notes of good and poor work practices that you observe. (These could be photos, if you have the equipment.)
- As a group, review observations and work practice notes from participant worksheets.

Instructions for Wet Vacuuming Exercise

See page 83 of the Participant Guide.

Materials:

- Wet vacuum cleaner
- Plastic container for liquid waste
- GloGerm powder
- UV light
- Gloves
- Plastic sheeting
- Duct tape
- Q-tips

Instructions:

- Divide participants into groups.
- Pass out materials.
- Guide participants through procedures listed on the worksheet in the Participant Guide.
- Assist as needed.
- Have participants fill out the worksheet.

Review:

- As the instructor, you should make notes of good and poor work practices that you observe. (These could be photos, if you have the equipment.)
- As a group, review observations and work practice notes from participant worksheets.

Instructions for Wet Wipe Exercise

See page 84 of the Participant Guide.

Materials:

- Disposable rags
- GloGerm oil or powder
- Various “contaminated” surfaces: linoleum, cabinetry, painted drywall, etc
- Bucket of soapy water
- Trash can for disposal of rags
- Gloves
- UV light

Instructions:

- Divide participants into groups.
- Pass out materials.
- Guide participants through procedures listed on the worksheet in the Participant Guide.
- Assist as needed.
- Have participants fill out the worksheet.

Review:

- As the instructor, you should make notes of good and poor work practices that you observe. (These could be photos, if you have the equipment.)
- As a group, review observations and work practice notes from participant worksheets.

Instructions for HEPA Vacuuming Exercise

See page 85 of the Participant Guide.

Materials:

- Vacuum cleaner with HEPA filter
- Vacuum cleaner without HEPA filter
- Contact paper
- GloGerm powder
- UV light
- Gloves
- Plastic sheeting
- Duct tape
- Q-tips

Instructions:

- Divide participants into groups.
- Pass out materials.
- Guide participants through procedures listed on the worksheet in the Participant Guide.
- Assist as needed.
- Have participants fill out the worksheet.

Review:

- As the instructor, you should make notes of good and poor work practices that you observe. (These could be photos, if you have the equipment.)
- As a group, review observations and work practice notes from participant worksheets.

Instructions for Disposal of Solid Debris Exercise

See page 86 of the Participant Guide.

Materials:

- Large pieces of lumber, drywall, carpeting, etc.
- GloGerm powder or oil
- UV light
- Gloves, eye protection
- Plastic sheeting
- Duct tape
- Hammer, saw, shears
- Large waste bin, some distance away
- Q-tips

Instructions:

- Divide participants into groups.
- Pass out materials.
- Guide participants through procedures listed on the worksheet in the Participant Guide.
- Assist as needed.
- Have participants fill out the worksheet.

Review:

- As the instructor, you should make notes of good and poor work practices that you observe. (These could be photos, if you have the equipment.)
- As a group, review observations and work practice notes from participant worksheets.

Instructions for Unexpected Situations Exercise

Have participants answer the questions on page 88 in the Participant Guide.

Answers:

1. Someone slipped on wet poly and could not get up due to back pain?

See emergency response plan. Follow.

2. You tried five gloves and each one tore as you donned it?

Rethink your donning procedures. Are you donning the gloves properly? Are the gloves defective? Do you have a sharp fingernail that could be responsible for the tears?

3. Behind drywall, you find dripping water?

Refer to the *Mold Remediation – Key Steps* figure on page 22 and Exercise: Job Duties on page 24 of the Participant Guide.

Answers to Review Questions

Have students complete the review questions section on page 93 in the Participant Guide.

Answers:

1. What is amended water? (See pg. 54.)

Amended water is tap water mixed with a detergent or other surfactant (such as soap or a mixture of polyoxyethylene ether and polyoxyethylene ester). This makes the water “wetter”.

2. What is the contaminant in all black water? (See pg. 55.)

Raw sewage (viruses + bacteria).

3. List five safety practices that reduce the possibility of injury during remediation. (See pg. 56.)

- Ergonomics
- Egress
- Walking and working surfaces
- Ladders and scaffolding
- Lock-out procedures
- Hand and portable power tools
- Compressed air use
- Electrical safety
- Confined space
- Heat and cold
- Hazard communication

4. Pick out a surface in the room where you are sitting that is about 100 square feet. Measure it. How close to the 100 square feet were you?

Provide measuring tape for trainees.

5. Why is a HEPA vacuum an essential tool for dry cleanup? (See pg. 75.)

HEPA vacuums keep mold spores from re-entering the air because of their highly efficient filters, thus protecting workers & building occupants.

Checklist: Work Practices

- | | | |
|---|------------------------------|-----------------------------|
| 1. Containment Exercise Completed | Yes <input type="checkbox"/> | No <input type="checkbox"/> |
| 2. Wet Vacuuming Exercise Completed | Yes <input type="checkbox"/> | No <input type="checkbox"/> |
| 3. Wet Wipe Exercise Completed | Yes <input type="checkbox"/> | No <input type="checkbox"/> |
| 4. HEPA Vacuuming Exercise Completed | Yes <input type="checkbox"/> | No <input type="checkbox"/> |
| 5. Disposal of Solid Debris Exercise Completed | Yes <input type="checkbox"/> | No <input type="checkbox"/> |
| 6. Unexpected Situations Exercise Completed | Yes <input type="checkbox"/> | No <input type="checkbox"/> |
| 7. Review Questions Completed | Yes <input type="checkbox"/> | No <input type="checkbox"/> |

DECONTAMINATION

Refer to Participant Guide, pages 94-101.

This chapter teaches participants about the value of decontamination during mold remediation. It also teaches participants proper techniques and procedures.

Minimum Content Requirements

The following are minimum content requirements for the Decontamination chapter:

- Reasons for using decontamination.
- Stations required for decontamination.
- Steps required to enter the work area when using wet decontamination.
- Steps required to leave the work area when using wet decontamination.
- **Exercise: Handwashing**

Teaching Methods

- Discussion
- Exercise

Reference Materials

- EPA. 402-K-01-001. *Mold Remediation in Schools and Commercial Buildings*. March 2001. <http://www.epa.gov/mold/pdfs/moldremediation.pdf>. Accessed 4/12/07.
- Laborers-AGC Education and Training Fund. *Microbial Remediation*. June 2003.

Questions You May Be Asked

- Can this stuff really be carried home?
 - Yes.
- If the mold is no longer growing, is it really a hazard?
 - Yes, the mold casing and fragments of it can cause health effects. Dead mold still carries compounds that are toxic.

Audio Visuals

- Projector
- Flipchart & markers
- Blue painter's tape (can use to attach pages to wall)
- List all the relevant slides/graphics that are part of the program

Special Space Requirements

- Meeting area for small groups

Suggested Instructor Preparation

- Review reference materials
- Review this section
- Prepare slides with answers to review questions

Instructions for Handwashing Exercise

See page 95 in the Participant Guide.

Materials:

- GloGerm oil
- UV light
- Sink for handwashing
- Soap

Instructions:

- Have participants coat their hands with GloGerm oil.
- Have them wash with soap and water.
- Use UV light to see how thoroughly washing removed contamination.
- Instruct participants to complete the checklist in the Participant Guide.

Answers to Review Questions

Have students complete the review questions section on page 100 in the Participant Guide.

Answers:

1. List three reasons to use a decontamination process. (See pg. 95.)
 - Keeps you free from contamination.
 - Keeps you from spreading contamination outside the remediation area.
 - Keeps tools and equipment free of excess contamination.

2. List the stations in a 3-station decon. (See pgs. 98-99.)
 - Equipment drop room.
 - Shower room.
 - Clean change room.

3. Put the following “steps to enter when using wet decon” in order, by placing a number to the left, 1-9 (see pg. 100):
 2. Remove street clothes.
 3. Don work clothes (protective clothing, respirator).
 7. Move through shower room into the equipment room.
 5. Inspect and don respirator.
 9. Pick up any tools needed.
 6. Put head covering on over respirator straps.
 8. Don any additional PPE necessary (hardhat, etc.).
 4. Seal gaps at wrists and ankles with duct tape.
 1. Enter the clean room.

4. Put the following steps to exit when using wet decon in order, by placing a number to the left, 1-11 (see pg. 100):
 11. Store respirator.
 9. Wash body and hair thoroughly.
 4. Put all disposable items into the waste bin.
 3. Doff all PPE except respirator.
 7. Wet hair and respirator thoroughly and remove respirator.
 5. Put all reusable items into the decon bin.
 10. Enter clean room, dry off, and redress in street clothing.
 1. Using gloved hands, brush off visible contamination.
 8. Follow protocol for cleaning respirator.
 2. Enter equipment room.
 6. Enter shower room.

Checklist: Decontamination

1. Handwashing Exercise Completed

Yes

No

2. Review Questions Completed

Yes

No

SIMULATION

The Mold Remediation Simulation involves four tasks that trainees must complete as well as practice donning and doffing both Limited and Full PPE that will be used in mold remediation work. The purpose of this simulation is to prepare trainees using hands-on activities for the actual work they will be doing during mold remediation. The four activities of this simulation are:

- Setting up containment
- Wet wipe
- Disposal of solid wastes
- HEPA vacuuming

Simulation Objectives

When you have completed this simulation, you will be better able to:

- Demonstrate donning of limited personal protective equipment.
- Demonstrate wet wipe work practices.
- Demonstrate disposal of solid wastes.
- Demonstrate doffing of limited personal protective equipment.
- Demonstrate donning full PPE.
- Demonstrate the proper use of a HEPA vacuum.
- Demonstrate setting up a containment area.
- Demonstrate doffing full PPE.

Mold Remediation Simulation Exercise – Rotation

8:00 – 9:00 AM Orientation to Site, Work Zones, Emergency Response Plan, Hand Signals, Exercise Stations and Rotation. Go over procedures for each of the stations listed below. Using the Basic Checklist for Mold Remediation (in the handouts & checklists section of this chapter), have trainees review planning for mold remediation activities.

I. Description of Mold Remediation Simulation Exercise Stations:

- | | |
|---------------------------------------|--|
| Station #1 | Don Limited PPE. |
| Station #2 | While wearing Limited PPE, trainees will practice surface cleaning techniques on several types of surfaces they will likely encounter during mold remediation such as linoleum, countertops, painted sheetrock, and a cabinet door. |
| Station #3 | While wearing Limited PPE, trainees will perform the following activities: <ol style="list-style-type: none"> a. Identify contamination on a rug, drywall, lumber, etc. b. Render materials unusable without getting contaminated or generating dust. c. Identify useful weight of plastic for encasing. d. Encase materials. e. Move encased materials to a set destination. |
| Station #4 | Doff Limited PPE. |
| TRAINEES WILL BE GIVEN A REST PERIOD. | |
| Station #5 | Don Full PPE. |
| Station #6 | While wearing Full PPE, trainees will practice using a HEPA vac in a ventilation system. Trainees will practice safe removal of filters to prevent spread of contamination. |
| Station #7 | While wearing Full PPE, trainees will practice setting up a containment area. |
| Station #8 | Doff Full PPE. |

II. Group Formation/Identification

1. Divide trainees into four equal groups: Group A1, Group A2, Group B1, and Group B2. There is a maximum of six people in each group.
2. Depending on the number of trainees in the class, group sizes or number and station order may have to be adjusted.
3. Once the groups are established, some means must be used so the instructor can easily identify the various groups. Suggested methods include:
 - a. color-coded hard hats
 - b. group designation on hard hats
 - c. Tyvek suit worn with group designation attached or applied with marker
 - d. traffic or other vest with attached group designation

III. Mold Remediation Simulation Layout

The Mold Remediation Simulation Exercise site should be laid out in a logical and clear fashion (see attached Typical Mold Remediation Simulation Layout). Each task station/area should be clearly marked. Suggested methods for marking include:

- a. signs or stakes
- b. numbers on traffic cones
- c. numbers on drums

IV. Conducting the Mold Remediation Simulation Exercise

When the site is set up with the task stations/areas marked, groups established and identified, equipment readied and the Orientation complete, the Exercise is ready to begin. Begin the Exercise per the Mold Remediation Simulation Rotation Schedule below. The schedule is tentative. Be aware of how quickly or slowly trainees are moving through stations and adjust schedule as needed.

Mold Remediation Simulation Rotation Schedule

Time/Group	A1	A2	B1	B2
9:00 – 9:20	1	1	5	5
9:20 – 9:40	2	3	6	6
9:40 – 10:00	3	2	7	7
10:00 – 10:20	4	4	8	8
10:20 – 10:40	<i>rehydrate, snack & break</i>			
10:40 – 11:00	5	5	1	1
11:00 – 11:20	6	7	2	3
11:20 – 11:40	7	6	3	2
11:40 – 12:00	8	8	4	4
12:00 – 2:00	<i>finish activities, discussion & critique</i>			

As the groups begin to rotate, keep in mind the rotation follows a basic pattern:

- Half the trainees (Group A) will begin with the Limited PPE oriented stations.
- Group A will then divide in two, with A1 doing one station and A2 doing another.
- Groups A1 and A2 will then switch.
- Group A members will doff their Limited PPE.
- The other half of the trainees (Group B) will begin the Full PPE oriented stations.
- Group B will then divide, switch, and doff PPE like Group A did.
- Group A and B will then switch, so that Group A will do Full oriented stations and Group B will do Limited PPE oriented stations.

Exercise Procedures

Use your best judgment when dividing trainees into groups for the Mold Remediation Simulation. For example, if six trainees are assigned to use one HEPA vac, then some people won't get enough hands-on training. It would be more beneficial to the trainees to provide two vacuums and split the group in half, so each trainee has more hands-on involvement in the exercise. Fine-tune the following procedures to best fit the needs of the trainees.

Station #1 – Don Limited PPE

Materials

- 24 sets of Limited PPE
- Several rolls duct tape
- 2 stools or small ladders

Instructor Prep

- Set out all materials
- Mark off area for Station #1
- Review and make 24 copies of Station #1 Checklist

Trainee Actions

- Help each other don Limited PPE in this order:
 - Disposable coveralls
 - Boots
 - Respirator – N95 or half-face APR with HEPA filter
 - Gloves
 - Goggles
- Tape seams of boots and gloves to suit

- Fill out Station #1 Checklist after completing the station

Instructor Actions

- Assist as necessary
- Initial trainee's checklists

Station #2 – Wet Wipe

Materials

- Squares of linoleum, ceramic tiles, plastics, wood
- Work table
- Bucket full of soapy water
- Disposable rags
- GloGerm oil or powder
- Utility sink or drain for wastewater disposal
- Wet vac or plastic containers (for cleanup only)

Instructor Prep

- Set out all materials
- Mark off area for Station #2
- “Contaminate” linoleum, sheetrock, countertop, and cabinet door with GloGerm oil or powder
- See Exercise: Station #2 for optional ideas and materials
- Review and make 24 copies of Station #2 Checklist

Trainee Actions

- Examine materials for visible signs of contamination
- Materials that are heavily contaminated should be disposed of
- If not considered hazardous waste (usually the case), dispose of materials in the landfill
- Wash with soap and water
- Collect waste water with a wet vacuum cleaner (shop vac) or in plastic containers
- Dispose of waste water down a sink or toilet
- Check PPE for tears, rips
- Fill out Station #2 Checklist after completing the station

Instructor Actions

- Reapply GloGerm powder as necessary
- Initial trainees' checklists

Station #3 – Disposal of Solid Wastes

Materials

- 1 or 2 rugs or pieces of carpeting up to 9'x12', based on number of trainees per group
- Lumber, plywood, or old wooden desks/chairs headed for the garbage
- Drywall
- GloGerm oil or powder
- Various weights rollable plastic sheeting, sufficient to encase “waste” materials
- 2 rolls duct tape
- Traffic cone
- UV light (black light)
- Trash can

Instructor Prep

- Set out all materials
- Mark off area for Station #2
- Sprinkle wood, drywall, and carpet with GloGerm oil or powder to serve as the contaminant
- GloGerm oil/powder glows under a UV light
- Using the traffic cone, clearly mark a destination point where the encased materials must be transported to
- See Exercise Stimuli: Station #3 for optional ideas and materials
- Review and make 24 copies of Station #3 Checklist
- Remind trainees that certain types of materials cannot be thoroughly decontaminated (wood, carpet, drywall) and so they must be thrown out
- Based on number of trainees per group:
 - If 5-6 trainees, have the group split and encase & dispose of two bundles of waste materials.
 - If 4 or fewer, assign group to encase and dispose of one bundle of waste materials.

Trainee Actions

- While wearing Limited PPE ...
- Examine materials and identify contamination
- Roll and encase materials in plastic, using duct tape, without generating dust or contaminating themselves
- Move encased materials to the destination point
- Check PPE for tears, rips
- Fill out Station #3 Checklist after completing the station

Instructor Actions

- After trainees have finished moving the materials, shine the UV light on their PPE to see if they glow – evidence of contamination

- Return materials to original point
- Unwrap materials and throw plastic sheeting and duct tape into trash
- View rugs with UV light and, if necessary, re-sprinkle rug with GloGerm oil or powder
- You may enlist trainee assistance in resetting the station
- Initial trainee's checklists

Station #4 – Doff Limited PPE

Materials

- Trash cans
- Bin labeled “Decon Bin”
- Soap and water for washing down boots
- Separate source of soap and water for hand washing

Instructor Prep

- Set out all materials
- Mark off area for Station #4
- Review and make 24 copies of Station #4 Checklist
- Remind trainees of importance of personal hygiene at this time (thorough hand washing)

Trainee Actions

- Help each other doff Limited PPE in this order:
 - Boots
 - Disposable coveralls
 - Respirators
 - Goggles
 - Gloves
- Dispose of coveralls and gloves in trash
- Place respirators and goggles in Decon Bin
- Wash down boots
- Fill out Station #4 Checklist after completing the station

Instructor Actions

- Assist as necessary
- Initial trainee's checklists

Station #5 – Don Full PPE

Materials

- 24 sets of Full PPE
- Several rolls of duct tape

- 2 stools or small ladders

Instructor Prep

- Set out all materials
- Mark off area for Station #5
- Review and make 24 copies of Station #5 Checklist

Trainee Actions

- Help each other don Full PPE in this order:
 - Disposable suits
 - Boots
 - Boot covers
 - Goggles
 - Gloves
 - Full-face APR with HEPA filter
 - Head covers
- Tape seams of boots and gloves to suit
- Fill out Station #5 Checklist after completing the station

Instructor Actions

- Assist as necessary
- Initial trainees' checklists

Station #6 – HEPA Vacuuming

Materials

- Vacuum cleaner with HEPA filter
- 1 or 2 ducts and attached grills
- Screwdrivers or other appropriate tool for taking grill off duct
- GloGerm powder
- UV light
- Plastic wrap
- Duct tape
- If necessary, non-wood ladder
- If outdoors, work table
- Trash can

Instructor Prep

- Set out all materials
- Mark off area for Station #6
- If indoors, have trainees work on an actual duct in the wall
- If outdoors, have length of ductwork and attached grill on worktable
- Simulate contamination of duct and grill with GloGerm powder

- See Exercise Stimuli: Station #6 for optional ideas and materials
- Review and make 24 copies of Station #6 Checklist
- Remind trainees that duct cleaning is important to mold remediation because as air circulates throughout the ducts, contamination could spread
- Based on number of trainees per group:
 - If 5-6 trainees, assign half to one duct and half to another duct
 - If 4 or fewer, assign group to just one duct
- If indoors and there are many ducts around the room, have trainees do all different ducts instead of focusing on just one since it is difficult to simulate dust and grime build-up.

Trainee Actions

- While wearing Full PPE ...
- Unscrew grill off the duct
- Vacuum grill & duct work with HEPA vac
- Practice safe removal of vacuum cleaner filters, dust bags, and/or dust receptacles
- Wrap filter in plastic and tape
- Check for spread of contamination with UV light
- Check PPE for tears, rips
- Fill out Station #6 Checklist after completing the station

Instructor Actions

- Reset station by sprinkling area with GloGerm powder, as necessary
- Initial trainee's checklists

Station #7 – Setting up the Containment Area

Materials

- A room to treat as a mold-contaminated hot zone
- 6-mil poly
- Duct tape
- Spray adhesive
- Furring strips
- Nails
- Hammers & saws
- Staple gun & staples
- Retractable razor knives
- Warning signs
- Ladders/scaffolding
- Work gloves

Instructor Prep

- Set out all materials
- Mark off area for Station #7
- Review and make 24 copies of Station #7 Checklist
- See Exercise Stimuli: Station #6 for optional ideas and materials

Trainee Actions

- Remove furniture & light fixtures from room.
- In real life, these should be HEPA vacuumed & wet wiped before removing. Skip this for now.
- If items cannot be removed, they should be dried and covered in plastic.
- In real life, the entire room should then be HEPA vacuumed. Skip this for now.
- Seal all vents, windows, and extra doors with two layers of 6-mil poly and duct tape.
 - There should be only one entrance to the work area.
 - Overlap the tape.
 - Extend the poly 4 to 6 inches past the frame of vents, windows, and doors.
 - The first layer must not be removed until the room has passed inspection.
- Floors
 - Cover floors with several layers of poly that are glued together with spray adhesive. This will guard against wear and tear.
 - Be aware of possible fumes from the spray adhesive. Read the label carefully.
 - Cover any seams in the floor layer with duct tape.
 - The floor covering should extend 24 inches up the wall.
- Walls
 - Cover uncontaminated walls with a single layer of poly.
 - Cover all seams with duct tape.
- Floors
 - Put a second layer of poly on the floors using duct tape and spray adhesive.
 - The edges of this layer should extend up the wall a few inches past the first layer.
 - Seams of the second layer should be offset from the first layer.
- Walls
 - Put a second layer of poly on uncontaminated walls.
- Ceiling
 - Put a layer of poly on the ceiling and secure with duct tape and furring strips.
- Create a doorway/airlock
 - Cover the doorway with a sheet of 6-mil poly, extending the edges of the poly 4-6 inches past the frame.
 - Duct tape the edges down, overlapping the ends of the tape.
 - Cut a slit in the center of the poly.

- Tape a second sheet of poly on one side of the doorway, with tape extending along the top of the poly and on the left-hand side (when facing doorway).
- Move to the other side of the doorway.
- Tape a third sheet of poly on one side of the doorway, with tape extending along the top of the poly and the right-hand side (when facing doorway).
- This will create an S-shaped entryway.
- Fill out Station #7 Checklist after completing the station

Instructor Actions

- Assist trainees and give instructions where necessary.
- Initial trainees' checklists.

Station #8 – Doff Full PPE

Materials

- Trash cans
- Bin labeled “Decon Bin”
- Soap and water for washing down boots
- Separate source of soap and water for hand washing

Instructor Prep

- Set out all materials
- Mark off area for Station #8
- Review and make 24 copies of Station #8 Checklist
- Remind trainees of importance of personal hygiene at this time (hand washing)

Trainee Actions

- Help each other doff Full PPE in this order:
 - Boot covers
 - Boots
 - Disposable coveralls
 - Head covers
 - Full-face APRs with HEPA filters
 - Goggles
 - Gloves
- Dispose of boot covers, disposable coveralls, head covers, and gloves in trash
- Place goggles and respirators in Decon Bin
- Wash down boots
- Fill out Station #8 Checklist after completing the station

Instructor Actions

- Assist as necessary
- Initial trainees' checklists

Exercise Stimuli (Optional)

Introduce these stimuli to trainees to make activities more interesting. Also use to tailor program to trainees' needs and interests. Feel free to add your own stimuli to this list.

Station #2 – Wet Wipe

Stimulus: Rinse water.
 Proper Response: Identify need to collect waste water from cleaning. Collect. Dispose of per local regulations.
 Resources Required: Plastic tubs, squeegee, wet vacuum cleaner (shop vac), disposable rags, paper towels.

Station #3 – Disposal of Solid Wastes

Stimulus: Glass has cut through the plastic.
 Proper Response: Remove glass and place in sturdy plastic container. Re-wrap waste in plastic and seal. Clean up any contamination which may have spread.
 Resources Required: Glass.

Station #6 – HEPA Vacuuming

Stimulus: Duct out of arm's reach.
 Proper Response: Acquire non-wood ladder (wood may retain contamination) and use it to properly reach duct.
 Resources Required: Non-wood ladder.

Station #7 – Setting up the Containment Area

Stimulus: Furring strips fall.
 Proper Response: Using a ladder to reach safely, reattach furring strips.
 Resources Required: Furring strips, non-wood ladder.

Critique

As the mold remediation simulation is being carried out by participants, pay close attention to their actions. On the checklists, make note of when a group or participant does particularly well or does a task inefficiently/incorrectly. After the simulation is over, and after a lunch break, gather trainees together in a large group.

Open a discussion on the simulation. How did the trainees like the exercise? Opinions on content and duration are welcome. What do trainees think went well? This is a learning experience for the trainees, so errors are also expected. View errors as a chance to improve. Invite trainees to discuss what they could do to improve their performance during real mold remediation activities. Instructors should also be afforded the opportunity to participate in this discussion.

Video tape playback can help trainees to recognize their own successes and problem areas.

Use a blackboard or a flip chart to record insightful or key points.

If any useful feedback for improving the course comes up during discussion, please forward those comments to UC, and they will be considered for the next version.

Simulation Definition

The Mold Remediation Simulation is a series of exercises designed to familiarize each program trainee with the proper protocols used during mold remediation activities.

Minimum Simulated Site Specifications

1. Running water available from an outside spigot or an air-driven pump (if outdoors) or an indoor spigot or water fountain (if indoors) to supply water for remediation exercises and to provide potable water to prevent dehydration among trainees during simulation.
2. Telephone or radio to summon emergency assistance.
3. Access to adequate restrooms within 100 yards of site.
4. Physical space (parking lot, field, large indoor area, at least 150' X 100').
5. Shelter (if outdoors) or briefing room with a seating capacity of at least 30.
6. If planning to hold simulation outdoors, prepare contingency plan for bad weather.
7. Site should be situated so as to minimize public reaction or preparations should be made to deal with the public.

8. A sign should be used to indicate that training is occurring. Local authorities (police, fire, etc.) and the local media (print, radio, and television) should be notified of the exercise. Also use for publicity.
9. If night exercises contemplated, provide for adequate lighting.
10. Close proximity to classroom facility is preferable.

Assumptions

1. Class size – 24 trainees maximum
2. Required equipment and materials:
 - a. 24 Limited PPE Outfits
 - i. Disposable coveralls
 - ii. Boots
 - iii. Head covers
 - iv. Gloves
 - v. N95 Respirators or Half-face APRs with HEPA filters
 - vi. Goggles
 - b. 24 Full PPE Outfits
 - i. Disposable coveralls
 - ii. Boots
 - iii. Boot covers
 - iv. Head covers
 - v. Gloves
 - vi. Goggles
 - vii. Full-face APRs with HEPA filters
 - c. Work tables
 - d. 24 clipboards & pens
 - e. 24 copies of each Station Checklist
 - f. De-fogging solution
 - g. First Aid Kit
 - h. Drinking fluids/supplies
 - i. Barrier tape/stakes/safety cones
 - j. 3 Trash cans
 - k. 8 Rolls of duct tape
 - l. 4 Stools or short ladders for suiting up
 - m. 2 Large plastic bins labeled “Decon Bin”
 - n. GloGerm oil or powder (purchase online at www.glogerm.com)
 - o. UV light (black light)
 - p. Vacuum with HEPA filter
 - q. Vacuum without HEPA filter
 - r. Contact paper
 - s. Rugs or pieces of carpeting up to 9’x12’
 - t. Lumber, concrete blocks, upholstered furniture, linoleum squares, ceramic tile
 - u. Enough 6-mil poly to complete disposal of solid waste exercise
 - v. Bucket of soapy water
 - w. Disposable rags
 - x. Plastic containers

3. Optional equipment and supplies:
 - a. Leather gloves
 - b. Non-wood ladder
 - c. Squeegee
 - d. Wet vacuum cleaner
4. Required trainee attire for mold remediation simulation:
 - a. Must wear steel toed shoes.
 - b. If eyeglasses are worn, must wear. No contacts can be worn with respiratory protection. Consideration needs to be given to how those workers who wear glasses can be accommodated (special kits can be purchased for F/F masks).
 - c. Work clothes (may be stained).
5. **Trainees must provide a doctor note verifying physical capabilities before being permitted to suit up and participate.**

Mold Remediation Performance Checklists

See the following pages.

Mold Remediation Performance Checklist
Station 1: Don Limited PPE

Think about when you were donning Limited PPE. Please answer the following questions and obtain the instructor's initials.

Trainee Name: _____

YES NO

1. Did you inspect the PPE for rips or defects?
2. Was there any defective equipment?
3. If so, what?

4. Did you suit up in Limited PPE?
5. Did you up the PPE on in this order?
 - a.Disposable suit
 - b.Boots
 - c.Respirator – N95 or half-face APR with HEPA filter
 - d.Gloves
 - e.Goggles
6. Did you or your partner tape seams around your boots?
7. Did you or your partner tape seams around your gloves?
8. Did you encounter any difficulties?
9. List any difficulties below:

Instructor's Initials: _____

Mold Remediation Performance Checklist
Station 2: Wet Wipe

Think about your performance with wet wiping surfaces. Please answer the following questions and obtain the instructor's initials.

Trainee Name: _____

YES NO

1. Were you suited up in Limited PPE?
2. Did you personally work with any of the following surfaces?
 - a. Linoleum
 - b. Ceramic
 - c. Plastic
 - d. Wood
3. Did you use soapy water to wash surfaces?
4. Did you collect waste water?
5. Did you dispose of waste water down the drain?
6. When you had finished, did the UV light show any remaining "contamination" on the surface?
7. Did you see any "contamination" on your gloves?
8. Did you encounter any difficulties?
9. List any difficulties below:

Instructor's Initials: _____

Mold Remediation Performance Checklist
Station 3: Disposal of Solid Wastes

Think about your performance as you disposed of solid wastes. Please answer the following questions and obtain the instructor’s initials.

Trainee Name: _____

YES NO

1. Did you wear Limited PPE?
2. Did you identify any contamination on the solid waste?
3. Did you and your partner break up any waste materials?
4. Did you and your partner collect and move waste materials without generating dust?
5. Did you seal any waste in 6-mil poly?
6. Did you carry any packaged waste to a trash receptacle?
7. When you had finished, did the UV light show any “contamination” on your gloves?
8. Did you see any “contamination” glowing on the Q-tip swab taken from the exterior of the packaged waste?
9. Did you encounter any difficulties?
10. List any difficulties below:

Instructor’s Initials: _____

Mold Remediation Performance Checklist
Station 4: Doff Limited PPE

Think about when you were doffing Limited PPE. Please answer the following questions and obtain the instructor's initials.

Trainee Name: _____

YES NO

1. Did you doff your Limited PPE?
2. During the activities, did your suit or gloves rip?
3. Did you doff the PPE on in this order?
 - a. Boots
 - b. Disposable suit
 - c. Respirator – N95 or half-face APR with HEPA filter
 - d. Goggles
 - e. Gloves
4. Did you wash down your boots?
5. Did you put your disposable suit in the trash?
6. If you wore a half-face APR, did you put it in the decon bin?
7. If you wore an N95 respirator, did you put it in the trash?
8. Did you put your goggles in the decon bin?
9. Did you put your gloves in the trash?
10. Did you wash your hands afterwards?
11. Did you encounter any difficulties?
12. List any difficulties below:

Instructor's Initials: _____

Mold Remediation Performance Checklist
Station 5: Don Full PPE

Think about when you were donning Full PPE. Please answer the following questions and obtain the instructor's initials.

Trainee Name: _____

YES NO

- 1. Did you inspect the PPE for rips or defects?
- 2. Was there any defective equipment?
- 3. If so, what?

- 4. Did you suit up in Full PPE?
- 5. Did you up the PPE on in this order?
 - a. Disposable suit
 - b. Boots
 - c. Boot covers
 - d. Goggles
 - e. Gloves
 - f. Respirator – full-face APR with HEPA filter
 - g. Head cover
- 6. Did you or your partner tape seams around your boots?
- 7. Did you or your partner tape seams around your gloves?
- 8. Did you encounter any difficulties?
- 9. List any difficulties below:

Instructor's Initials: _____

Mold Remediation Performance Checklist
Station 6: HEPA Vacuuming

Think about your performance with the HEPA vacuum cleaner. Please answer the following questions and obtain the instructor's initials.

Trainee Name: _____

YES NO

1. Were you suited up in Full PPE?
2. Did you or your partner unscrew the grill off the duct?
3. Did you or your partner use a HEPA-filtered vacuum cleaner?
4. Did you practice safe removal the HEPA vacuum's filter?
5. Did you seal it in plastic?
6. When you looked at the sealed vacuum filter under UV light, did you see any "contamination" on the exterior of the package?
7. Did you see any "contamination" on your gloves?
8. Did you or your partner have to use a ladder?
9. Did you encounter any difficulties?
10. List any difficulties below:

Instructor's Initials: _____

Mold Remediation Performance Checklist
Station 7: Containment Area

Think about when you were setting up a containment area. Please answer the following questions and obtain the instructor's initials.

Trainee Name: _____

YES NO

1. Did you and your partner help set up a containment area?
2. Did you and your partner seal all vents, windows, and extra doors with two layers of poly and duct tape?
3. Did you extend the poly 4-6 inches past all vents, windows, and doors?
4. Did you and your partner cover the floor with several layers of poly?
5. Did you and your partner cover the walls with two layers of poly?
6. Did you and your partner cover the ceiling with a layer of poly?
7. Did you and your partner use furring strips?
8. Did you and your partner create a doorway or airlock?
9. Did you overlap the ends of all duct tape you used?
10. Did you encounter any difficulties?
11. List any difficulties below:

Instructor's Initials: _____

Mold Remediation Performance Checklist
Station 8: Doff Full PPE

Think about when you were doffing Full PPE. Please answer the following questions and obtain the instructor's initials.

Trainee Name: _____

YES NO

1. Did you doff your Full PPE?
2. During the activities, did your suit or gloves rip?
3. Did you doff the PPE on in this order?
 - a. Boot covers
 - b. Boots
 - c. Disposable suit
 - d. Head cover
 - e. Respirator – full-face APR with HEPA filter
 - f. Goggles
 - g. Gloves
4. Did you put your boot covers in the trash?
5. Did you wash down your boots?
6. Did you put your head cover in the trash?
7. Did you put your disposable suit in the trash?
8. Did you put your full-face APR in the decon bin?
9. Did you put your goggles in the decon bin?
10. Did you put your gloves in the trash?
11. Did you wash your hands afterwards?
12. Did you encounter any difficulties?
13. List any difficulties below:

Instructor's Initials: _____

APPENDIX A: MOLD REMEDIATION EMERGENCY RESPONSE PLAN

I. Introduction

- A. The Mold Remediation Simulation is a complex, multi-part exercise which integrates much of the training of the Mold Remediation Program into a hands-on simulation where attendees don and perform tasks in Limited and Full levels of respiratory and personal protective equipment.
- B. As with any hands-on simulation or exercise, there are numerous potential safety hazards. In order to insure that instructors and attendees are aware of these potential hazards and how to react to them, the minimum safety requirements enumerated below must be implemented during every Mold Remediation Simulation Exercise.

II. Safety Briefing

Before the Mold Remediation Simulation Exercise is started, all program attendees will receive a safety briefing which covers the contents of this plan. (You may want to have students sign a document to acknowledge receipt of briefing.) If in-suit radios are not used, a clear set of hand signals must be established, verified, and used during exercise if PPE will get in the way of regular verbal communication.

III. Emergency Briefing

- A. Emergency communications equipment (telephone, cell phone, 2-way radio) will be present on the site.
- B. Communications equipment will be verified to be working before the Simulation begins.
- C. Emergency telephone numbers and directions to the site will be posted at each telephone on the site.
- D. Maps to the nearest treatment center should be posted in the event it is elected to transport a non-emergency case for treatment.

IV. Emergency Medical Treatment

- A. At least one instructor present on the site shall have current certification in or the equivalent of the Red Cross Basic CPR course (8-hour).
- B. A standard First Aid Kit shall be available for use during the Mold Remediation Simulation Exercise.
- C. Use of standby EMS crew is preferable (if available) instead of the above.

V. Site Access

- A. There shall be at least two entrance/exit points to the simulation site.
- B. If the Mold Remediation Simulation Exercise is conducted in a public area, a sign shall be posted identifying it as a training simulation.

VI. Physical Hazards

- A. Heavy lifting and physical exertion will be required. Extra caution is required because of the additional stresses from PPE wear. Use of proper lifting technique is essential.
- B. The bulky, heavy PPE increases potential for falling because it restricts range of motion and changes the center of gravity. The extra weight also increases risk of injury from a fall. These problems will be magnified if the simulation site is not on level ground. The need for caution and attention to balance and dexterity must be emphasized. Non-suited safety person must stay close to each suited person.
- C. Handling and moving heavy materials is always hazardous, but even more so in PPE. All instructors and course attendees on site are required to wear safety shoes. Extra care and attention is required to protect the hand from pinching or crushing injuries.

VII. Heat Stress

- A. Heat stress due to wearing heavy equipment and chemical protective suits must be a major concern in summer months and cannot be ignored even in cold weather.
- B. All attendees should be familiar with heat stress from classroom presentations and be able to recognize it.
- C. Adequate drinking water and electrolyte replacements (e.g. Gatorade) must always be available. At high heat stress levels up to 2 liters per hour of liquid may be required by each person to maintain body fluid levels.

- D. Air temperature and humidity should be monitored before suits are donned. This information is available from the National Weather Service.
- E. The lead instructor on site must monitor heat stress condition and adjust work/rest times and breaks to insure everyone drinks enough fluid.
- F. All instructors and attendees must insure they drink adequate liquids to avoid becoming a heat casualty.
- G. Shaded break area is recommended.
- H. Cool weather may present opposite problem as suit is removed, person could chill from cold air hitting body.

VIII. Wearing of Limited and Full PPE

- A. Wearing of Limited and Full protection presents additional hazards which rate attention:
 - 1. Weight – The additional weight increases stress, and affects mobility and balance.
 - 2. Claustrophobia – Some people cannot handles being enclosed in a respirator or suit. They must be calmed and removed from the suit.
 - 3. Hyperventilation – The stress of suit or respirator causes some people to hyperventilate. They must be calmed and removed from the suit to restore normal breathing.

IX. Responsibilities

- A. Instructors:
 - 1. Must insure that all issues listed in this plan have been discussed in class prior to the Mold Remediation Simulation Exercise.
 - 2. Must insure all participants are aware of the hazards, how to recognize and react to them.
 - 3. Must have at least three instructors present at all times during the Mold Remediation Simulation Exercise. One shall be designated as lead and have overall responsibility for the exercise.
- B. Attendees:
 - 1. Be aware of the hazards from classroom training and the site safety briefing.
 - 2. Watch yourself and your fellow classmates to try to avoid hazards.

X. Weather

- A. In the event of adverse or inclement weather, the lead instructor must determine if the Exercise can be conducted without endangering the attendees substantially beyond the inherent risks of the Exercise under the best conditions. Weather conditions to be considered include, but are not limited to excessive heat or cold, rain, snow, and limited visibility.
- B. Plans should exist for use of an alternate sheltered site to avoid disruption due to weather.

XI. Emergency Stop

- A. An emergency stop signal (hand held air horns work well), separate and distinct from any signal used as a training stimulus will be used to terminate the exercise in the event of an emergency.
- B. All personnel on site must know the emergency stop signal.