



# INDOOR WATER INTRUSION (INDOOR WATER LINE BREAKS)

Region 8 Sustainability & Environmental Management System

## 1.0 Purpose & Scope

The purpose of this procedure is to provide a standardized approach to handle the unwanted entry of water, known as “water incursions or intrusions” into an indoor environment. This procedure applies to incidents, such as but not limited to:

- indoor water line breaks or leaks associated with plumbing,
- sprinkler activation,
- leaks from roof, around window frames or foundations,
- heating, ventilating, and air conditioning (HVAC) system malfunctions,
- condensation from piping (insulated and uninsulated), and
- sewer line leak or back- up or break.

Water incursions / intrusions must be dealt with promptly and correctly to prevent mold and indoor air quality issues.

## 2.0 Activities & Departments Affected

Employees and contractors in Region 8 facilities should be aware of this procedure.

## 3.0 Exclusions

None.

## 4.0 Forms Used & Permits Required: (include reporting requirements)

Federal and State Forms and Permits: None

In-house GSA Region 8 and Contractor Forms:

- Work Orders

## 5.0 Acronyms, Abbreviations, and Definitions

Acronyms	Meaning
COR	Contracting Officer Representative
DFC	Denver Federal Center
EPA	U.S. Environmental Protection Agency
EPG	GSA, PBS, Region 8, Environmental Programs Group
GSA	U.S. General Services Administration
HVAC	heating, ventilating, and air conditioning
O&M	Operations and Maintenance
PBS	Public Building Service
PM	Project Manager
SEMS	Sustainability & Environmental Management System



# INDOOR WATER INTRUSION (INDOOR WATER LINE BREAKS)

Region 8 Sustainability & Environmental Management System

Definitions:

Black Water: Waste water contaminated with sewage.

Grey Water: Poor quality water obtained from baths, basins, sinks, washing machines, dishwashers etc.

## 6.0 Procedure

**State Specific Procedures & Requirements** [refer to individual State Legal Reviews for details on Statues, Laws, and Rules]: None

**Standardized Procedure:**

6.1 When anyone discovers water incursion, including water pooling on the floor, leaking water from the walls or ceiling or any other unusual circumstance, in any building, they will call:

During business hours	Call the <u>Building Manager</u> .	
	If the <u>Building Manager</u> is not available, call the other members of that <u>Building Manager's team</u> .	
After hours and on weekends	Otherwise call the Call Center:	
	For the DFC and all of Region 8:	<b>1-888-999-4777</b>
	Call the <u>Building Manager's</u> cell phone number listed on the DFC call sheet.	
	If the <u>Building Manager</u> does not answer, call the other members of that <u>Building Manager's team</u> .	
	Otherwise call the Call Center	
	For the DFC and all of Region 8:	<b>1-888-999-4777</b>

After hours the Call Center number is rerouted to the Mega Center **1-800-487-4158**

If at any point in this procedure it is discovered that water is flowing towards a sanitary sewer drain, the city's wastewater reclamation treatment authority needs to be contacted **IMMEDIATELY**. Follow the *GSA Sanitary Sewer Discharge Environmental Procedure*. At the Denver Federal Center also contact the GSA Environmental Programs Group (EPG) to handle notification and submittal of documentation.

6.2 The O&M Contractor will assess the water intrusion:

- Identify the source of the water.
- Stop the source, turn off the valve.
- Evaluate the extent of the problem and damage:

6.3 Once the source is identified and valve turned off, the O&M Contractor will leave the impacted area if any of the following is observed:

- Sanding water on floor



## INDOOR WATER INTRUSION (INDOOR WATER LINE BREAKS)

### Region 8 Sustainability & Environmental Management System

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- Wall or drywall impact
  - Ceiling tile impact
  - Carpet, furniture or equipment impact
- 6.4 First Response Actions (generally performed by the Building Manager's Operations and Maintenance (O&M) Contractor):
- Must occur with 24-48 hours, after which mold starts growing.
  - Mop or wet-vacuum any standing water on the floor before any cleaning begins.
  - The maintenance staff must be aware that specified areas of government facilities, whether owned or leased, may require higher levels of cleaning, such as with the use of bleach and/or other disinfectants. These areas may include child-care facilities, laboratories, and kitchens.
    - If this cleanup is not done by the maintenance staff, they or the building manager need to work with the Project Manager (PM) or Environmental Personnel to ensure these specific areas are handled as required.
- 6.5 If Mold is suspected (area has not been dried within 48 hours):
- Contact the Safety and Industrial Hygiene Team for guidance.
  - Mold or mildew may occur anywhere where moisture is found; under or on the flooring materials (e.g. carpeting), behind the walls or in the duct work.
  - Do not use deodorants and other strong smelling chemicals to mask potential musty odors. These chemicals may mask the existence of mold and make identifying mold contamination areas more difficult.
- 6.6 If sewage or water originating from the sewer lines, known as black water is present [special case]:
- All water incursions that may contain sewage, regardless of the extent of damage, will require a thorough cleaning of all affected surfaces with a soap and water. Dilute bleach solution (1 part bleach to 10 parts water) or an appropriate cleanser should be used.
  - All dry wall and other porous surfaces that have come in contact with black water must be removed.
    - Dispose of all porous items (e.g., drywall, books, carpet, padding, fabric furniture) contaminated with sewage water.
  - Occupants are not to enter contaminated areas until cleaning is completed.
- 6.7 Flooring:
- Flooring with moisture will require extraction cleaning of the carpeting; removal of the carpeting may be required depending on the level of damage and possible contamination. In areas where extensive mold growth is found, special work practices, similar to those used for asbestos abatement will be needed. Mold abatement may be beyond the in-house capabilities of the facility.
    - On square carpet tile, lifting up a corner and testing the underside with a moisture meter is recommended. If the carpet squares are moist, they should be removed and allowed to dry, before re-installation.



## INDOOR WATER INTRUSION (INDOOR WATER LINE BREAKS)

### Region 8 Sustainability & Environmental Management System

---

- Do not place furnishings back onto the carpet until it is completely dried. Use floor discharge fans to speed up the drying process.
- If floor tiles are removed from the floor, assume that they contain asbestos and contact the Asbestos Program Manager.

#### 6.7 Walls:

- Check drywall that may be impacted by water damage with a moisture meter. Hand dryness is **NOT** an appropriate check.
- If water, may have flowed behind the wall and the moisture meter indicates dampness, pull cove baseboard and call a disaster recovery company.
  - Check to confirm that the drywall is non-asbestos containing, so that the selected recovery company can drill holes along base and top of drywall to install specialty fans for drying.
  - Dry wall and other porous surfaces that have come in contact with water and have registered moisture content after 48 hours must be removed.
- Insulation that has become wet or moldy should be removed and replaced. If the material is suspected to be asbestos, contact the Asbestos Program Manager for further guidance.
- Remove and replace water-damaged drywall that has been wet for 72 hours or longer.

#### 6.8 Ceiling Tiles:

- Ceiling tiles that have water stains should be removed and replaced. Ceiling tiles should never be painted to cover water stains.
- Ceiling tiles that show evidence of mold growth need to be carefully removed, discarded and replaced. No special disposal procedures are necessary for stained or moldy ceiling tiles. Although all building materials with mold needs to be sealed in plastic, before being removed and carried out through a work area, to limit the spread of mold.

#### 6.9 Ductwork:

- Promptly remediate ventilation ductwork that shows signs of water incursion.
- Isolate the affected section of ductwork of the ventilation system before cleaning begins.

#### 6.10 Furnishings:

- All furnishings in the affected area should be wiped down with a soap and water or disinfectant solution (depending on the water source).
- Electronics should be allowed to thoroughly air dry before returning it to use.

## 7.0 Records Management

No reports are maintained. Work Orders are retained by the COR.



# INDOOR WATER INTRUSION (INDOOR WATER LINE BREAKS)

Region 8 Sustainability & Environmental Management System

## 8.0 References

Colorado Department of Public Health and Environment, 2002, "Mold Information Sheet"  
New York City Department of Health and Mental Hygiene, 2003, "Guidelines on Assessment and Remediation of Fungi in Indoor Environments"

Penn State University, the Milton S. Hershey Medical Center, College of Medicine, 2001, "Water Incursion Check List Procedures"

U.S. Environmental Protection Agency, 2001, "Mold Remediation in Schools and Commercial Buildings", EPA 402-K-01-001

U.S. Environmental Protection Agency, 2002, "A Brief Guide to Mold, Moisture and Your Home"

## 9.0 Appendices

**Attachment A:** Indoor Water Damage Response Flowchart

**Attachment B:** Water Damage Response Guidelines, From EPA, Tables 1 and 2

Document Control Information:	Approved & Dated:
Indoor Water Intrusion "Month-Date-Year".doc	RJM March 1, 2013

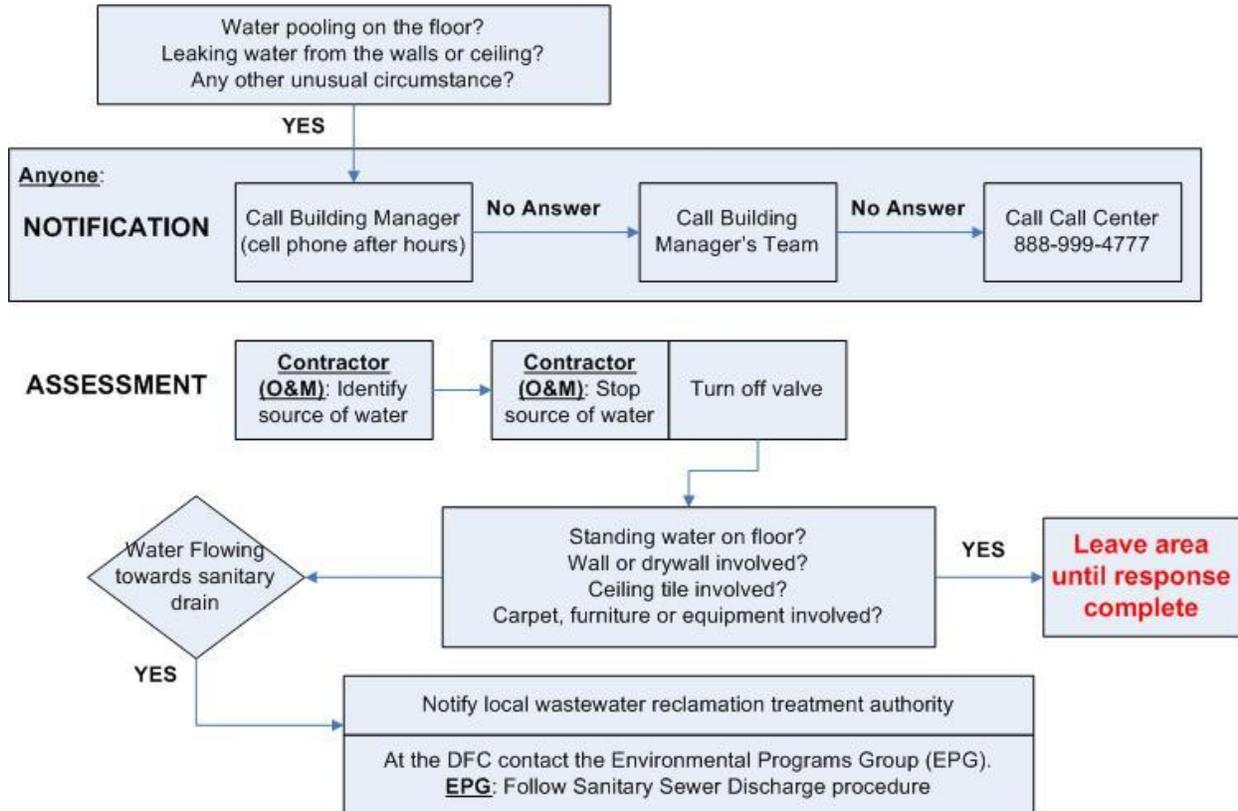
Document Revision and Update:		
Revision Date	Nature of Revision	Revision made by:
12/05/2008	Working Draft	Robert J. Melvin, Lindsay E. Allen
01/29/2009	Original Release	Robert J. Melvin, Tom Record, Mike Gasser, Mike Carr
01/29/2010	ISO 14001 update	Robert J. Melvin
03/30/2010	Consolidation and flow chart	Erik Petrovskis, Robert J. Melvin
04/13/2010	If water flows down the sanitary sewer notify proper individuals	Robert J. Melvin, Mike Gasser
05/22/2012	Emphasize Roles and Responsibilities in section 6, update flowchart	Nick Gutschow, Robert J. Melvin
03/01/2013	Update telephone numbers, add gsa.gov/sems url	Robert J. Melvin



# INDOOR WATER INTRUSION (INDOOR WATER LINE BREAKS)

Region 8 Sustainability & Environmental Management System

## ATTACHMENT A: Indoor Water Damage Response Flowchart



### FIRST RESPONSE ACTIONS (Property Manager Responsibility)

<p><b>Initial Response</b></p> <ul style="list-style-type: none"> <li><input type="checkbox"/> Must occur with 24-48 hours, after which mold starts growing.</li> <li><input type="checkbox"/> Mop or wet-vacuum any standing water on the floor before any cleaning begins.</li> <li><input type="checkbox"/> Sensitive areas (child-care, kitchens, laboratories) require more stringent cleaning</li> </ul>	<p><b>Mold Suspected?</b></p> <ul style="list-style-type: none"> <li><input type="checkbox"/> Contact the Safety and Industrial Hygiene Team for guidance. Mold or mildew may occur anywhere, where moisture is found.</li> <li><input type="checkbox"/> Do not use deodorants or other strong smelling chemicals to mask potential odors.</li> </ul>	<p><b>Sewage Suspected?</b></p> <ul style="list-style-type: none"> <li><input type="checkbox"/> Thorough cleaning with bleach (1:10) or equivalent</li> <li><input type="checkbox"/> Dispose all porous items</li> <li><input type="checkbox"/> No occupancy until cleaning complete</li> </ul>
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### SPECIAL CONSIDERATION

Review asbestos reports prior to restoration; added safety requirement.

<p><b>Flooring</b></p> <ul style="list-style-type: none"> <li><input type="checkbox"/> Test carpet tile for moisture</li> <li><input type="checkbox"/> Extraction clean carpet or remove</li> <li><input type="checkbox"/> Abate mold or asbestos, if needed</li> <li><input type="checkbox"/> Do not replace furnishings until dry</li> </ul>	<p><b>Walls</b></p> <ul style="list-style-type: none"> <li><input type="checkbox"/> Test walls for moisture</li> <li><input type="checkbox"/> Contact Asbestos Program Manager</li> <li><input type="checkbox"/> Remove insulation</li> <li><input type="checkbox"/> Replace drywall that has been wet for 48 hours or longer</li> </ul>	<p><b>Ceiling Tiles</b></p> <ul style="list-style-type: none"> <li><input type="checkbox"/> Replace stained ceiling tile</li> <li><input type="checkbox"/> Replace moldy ceiling tiles</li> </ul>
<p><b>Ductwork</b></p> <ul style="list-style-type: none"> <li><input type="checkbox"/> Isolate affected section and promptly remediate</li> </ul>	<p><b>Furnishings</b></p> <ul style="list-style-type: none"> <li><input type="checkbox"/> Wipe down with soap and water or disinfectant</li> <li><input type="checkbox"/> Thoroughly air dry electronics before use</li> </ul>	<p>Rev. 04/02/2012</p>



# INDOOR WATER INTRUSION (INDOOR WATER LINE BREAKS)

## Region 8 Sustainability & Environmental Management System

### ATTACHMENT B: WATER DAMAGE RESPONSE GUIDELINES, FROM EPA 402-K-01-001: MOLD REMEDIATION IN SCHOOLS AND COMMERCIAL BUILDINGS:

Table 1: Water Damage – Cleanup and Mold Prevention Guidelines for Response to Clean Water Damage Within 24-48 Hours to Prevent Mold Growth*	
Water-Damaged Material <sup>1</sup>	Actions
Books and papers	<ul style="list-style-type: none"> <li>• For non-valuable items, discard books and papers.</li> <li>• Photocopy valuable/important items; discard originals.</li> <li>• Freeze (in frost-free freezer or meat locker) or freeze-dry.</li> </ul>
Carpet and backing – dry within 24-48 hours <sup>2</sup>	<ul style="list-style-type: none"> <li>• Remove water with water extraction vacuum.</li> <li>• Reduce ambient humidity levels with dehumidifier.</li> <li>• Accelerate drying process with fans.</li> </ul>
Ceiling tiles	<ul style="list-style-type: none"> <li>• Discard and replace.</li> </ul>
Cellulose insulation	<ul style="list-style-type: none"> <li>• Discard and replace.</li> </ul>
Concrete or cinder block surfaces	<ul style="list-style-type: none"> <li>• Remove water with water extraction vacuum.</li> <li>• Accelerate drying process dehumidifiers, fans, and/or heaters.</li> </ul>
Fiberglass insulation	<ul style="list-style-type: none"> <li>• Discard and replace.</li> </ul>
Hard surface, porous flooring <sup>2</sup> (Linoleum, ceramic tile, vinyl)	<ul style="list-style-type: none"> <li>• Vacuum or damp wipe with water and mild detergent and allow to dry; scrub if necessary.</li> <li>• Check to make sure underflooring is dry; dry underflooring if necessary.</li> </ul>
Non-porous, hard surfaces (Plastics, metals)	<ul style="list-style-type: none"> <li>• Vacuum or damp wipe with water and mild detergent and allow to dry; scrub if necessary.</li> </ul>
Upholstered furniture	<ul style="list-style-type: none"> <li>• Remove water with water extraction vacuum.</li> <li>• Accelerate drying process dehumidifiers, fans, and/or heaters.</li> <li>• May be difficult to completely dry within 48 hours. If the piece is valuable, you may wish to consult a restoration/water damage professional who specializes in furniture.</li> </ul>
Wallboard (Drywall and gypsum board)	<ul style="list-style-type: none"> <li>• May be dried in place if there is no obvious swelling and the seams are intact. If not, remove, discard, and replace.</li> <li>• Ventilate the wall cavity, if possible.</li> </ul>
Window drapes	<ul style="list-style-type: none"> <li>• Follow laundering or cleaning instructions recommended by the manufacturer.</li> </ul>
Wood surfaces	<ul style="list-style-type: none"> <li>• Remove moisture immediately and use dehumidifiers, gentle heat, and fans for drying. (Use caution when applying heat to hardwood floors.)</li> <li>• Treated or finished wood surfaces may be cleaned with mild detergent and clean water and allowed to dry.</li> <li>• Wet paneling should be pried away from wall for drying.</li> </ul>
<p>* If mold growth has occurred or materials have been wet for more than 48 hours, consult Table 2 guidelines. Even if materials are dried within 48 hours, mold growth may have occurred. Items may be tested by professionals if there is doubt. Note that mold growth will not always occur after 48 hours; this is only a guideline.</p> <p>These guidelines are for damage caused by clean water. If you know or suspect that the water source is contaminated with sewage, or chemical or biological pollutants, then Personal Protective Equipment and containment are required by OSHA. An experienced professional should be consulted if you and/or your remediators do not have expertise remediating in contaminated water situations. Do not use fans before determining that the water is clean or sanitary.</p>	



# INDOOR WATER INTRUSION (INDOOR WATER LINE BREAKS)

## Region 8 Sustainability & Environmental Management System

<sup>1</sup> If a particular item(s) has high monetary or sentimental value, you may wish to consult a restoration/water damage specialist.

<sup>2</sup> The subfloor under the carpet or other flooring material must also be cleaned and dried. See the appropriate section of this table for recommended actions depending on the composition of the subfloor.

Table 2: Guidelines for Remediating Building Materials with Mold Growth Caused by Clean Water\*

Material or Furnishing Affected	Cleanup Methods <sup>†</sup>	Personal Protective Equipment	Containment
<b>SMALL – Total Surface Area Affected Less Than 10 square feet (ft<sup>2</sup>)</b>			
Books and papers	3	Minimum N-95 respirator, gloves, and goggles	None required
Carpet and backing	1, 3		
Concrete or cinder block	1, 3		
Hard surface, porous flooring (linoleum, ceramic tile, vinyl)	1, 2, 3		
Non-porous, hard surfaces (plastics, metals)	1, 2, 3		
Upholstered furniture & drapes	1, 3		
Wallboard (drywall and gypsum board)	3		
Wood surfaces	1, 2, 3		
<b>MEDIUM – Total Surface Area Affected Between 10 and 100 (ft<sup>2</sup>)</b>			
Books and papers	3	Limited or Full  Use professional judgment, consider potential for remediator exposure and size of contaminated area	Limited  Use professional judgment, consider potential for remediator/occupant exposure and size of contaminated area
Carpet and backing	1, 3, 4		
Concrete or cinder block	1, 3		
Hard surface, porous flooring (linoleum, ceramic tile, vinyl)	1, 2, 3		
Non-porous, hard surfaces (plastics, metals)	1, 2, 3		
Upholstered furniture & drapes	1, 3, 4		
Wallboard (drywall and gypsum board)	3, 4		
Wood surfaces	1, 2, 3		
<b>LARGE – Total Surface Area Affected Greater Than 100 (ft<sup>2</sup>) or Potential for Increased Occupant or Remediator Exposure During Remediation Estimated to be Significant</b>			
Books and papers	3	Full  Use professional judgment, consider potential for remediator exposure and size of contaminated area	Full  Use professional judgment, consider potential for remediator/occupant exposure and size of contaminated area
Carpet and backing	1, 3, 4		
Concrete or cinder block	1, 3		
Hard surface, porous flooring (linoleum, ceramic tile, vinyl)	1, 2, 3, 4		
Non-porous, hard surfaces (plastics, metals)	1, 2, 3		
Upholstered furniture & drapes	1, 3, 4		
Wallboard (drywall and gypsum board)	3, 4		
Wood surfaces	1, 2, 3, 4		
<p>*Use professional judgment to determine prudent levels of Personal Protective Equipment and containment for each situation, particularly as the remediation site size increases and the potential for exposure and health effects rises. Assess the need for increased Personal Protective Equipment, if, during the remediation, more extensive contamination is encountered than was expected. Consult Table 1 if materials have been wet for less than 48 hours, and mold growth is not apparent.</p> <p>These guidelines are for damage caused by clean water. If you know or suspect that the water source is contaminated with sewage, or chemical or biological pollutants, then the Occupational Safety and Health Administration (OSHA) requires PPE and containment.</p>			
<b>CLEANUP METHODS</b>			
Method 1:	Wet vacuum (in the case of porous materials, some mold spores/fragments will remain in the material)		



## INDOOR WATER INTRUSION (INDOOR WATER LINE BREAKS)

*Region 8 Sustainability & Environmental Management System*

	but will not grow if the material is completely dried). Steam cleaning may be an alternative for carpets and some upholstered furniture.
Method 2:	Damp-wipe surfaces with plain water or with water and detergent solution (except wood-use wood floor cleaner); scrub as needed.
Method 3:	High-efficiency particulate air (HEPA) vacuum after the material has been thoroughly dried. Dispose of the contents of the HEPA vacuum in well-sealed plastic bags.
Method 4:	Discard – remove water-damaged materials and seal in plastic bags while inside of containment, if present. Dispose of as normal waste. HEPA vacuum area after it is dried.
<b>CONTAINMENT</b>	
Limited:	Use polyethylene sheeting ceiling to floor around affected area with a slit entry and covering flap; maintain area under negative pressure with HEPA filtered fan unit. Block supply and return air vents within containment area.
Full:	Use two layers of fire-retardant polyethylene sheeting with one airlock chamber. Maintain area under negative pressure with HEPA filtered fan exhausted outside of building. Block supply and return air vents within containment area.

Source: [http://www.epa.gov/mold/mold\\_remediation.html](http://www.epa.gov/mold/mold_remediation.html)