

## Steps to Healthier Homes

- Start with People
- House as a System
- **Keep It:**
  - Dry
  - Pest-Free
  - Safe
  - Maintained**
- Making it Work
  - Clean
  - Ventilated
  - Contaminant-Free



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## Contaminant & Maintenance

### Legacy Toxics

- Lead-Based Paint
- Asbestos
  - Siding
  - Plaster
  - Insulation
- Chromated Copper Arsenate Wood
- Mercury
  - Thermometers & Fluorescent Lamps
- Pesticide Residues

### Created or Grown

- Cockroaches
- Mice and Rats
- Mold
- Carbon Monoxide
- Sewer Gas

And Then There is  
**Radon**



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## Maintenance

- Solid waste
- Water supply
- Sewer system
- Heating/cooling/dehumidification/humidification
- Cooking
- Ventilation
- Rainwater control/drainage
- Structural integrity
- Storage / Organization



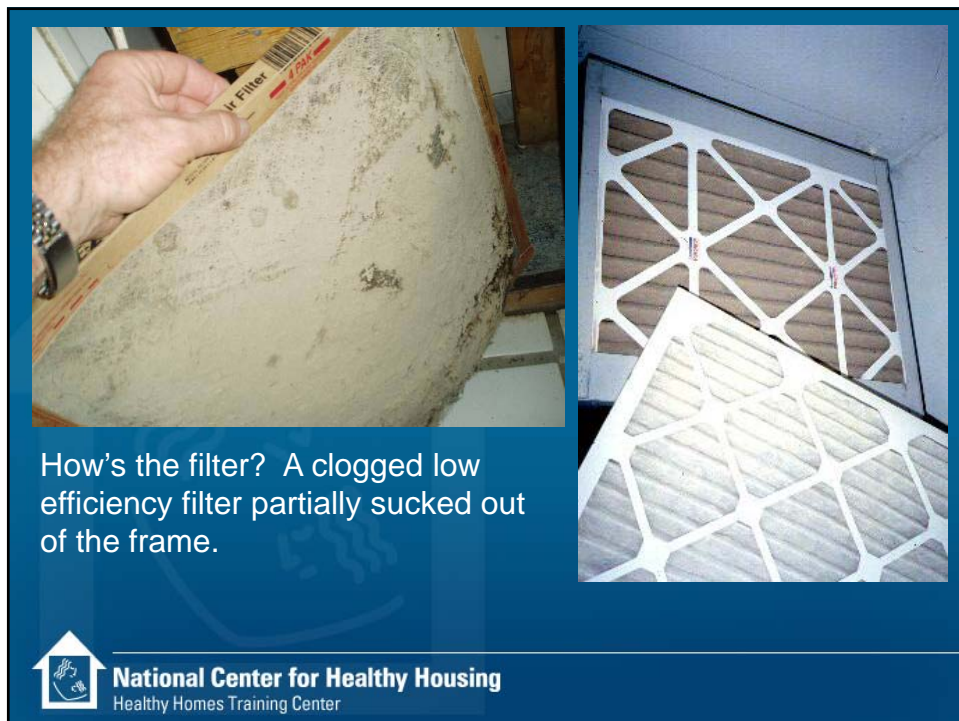
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## Maintenance Actions

- Inspect
- Clean
- Lubricate
- Replace
- Repair
- Organize



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## When?

- On-going
- Seasonally
- Annually

**Healthy Homes Maintenance Checklist**

The following checklist was developed for the Healthy Homes Training Center and Network as a tool for healthy home maintenance. A healthy home is one that is constructed, maintained, and rehabilitated in a manner that is conducive to good occupant health.

To maintain a healthy home, occupants should keep it dry, clean, and pest-free, and prevent injury and contact with chemical contaminants both indoors and outdoors. Good home maintenance can act to reduce allergens, prevent illness, and reduce injury from accidents. This checklist provides basic guidelines; items may need to be checked more often depending on local conditions and manufacturer suggestions.

Developed for the National Healthy Homes Training Center by Terry Brannon, Colorado Association and Elder Care, DPH Association.

	Spring	Fall	As Needed	As Needed (As Weather)
<b>Field &amp; Exterior</b>				
Water drains away from HOUSE	✓			
No trip, fall, chipping, chalking, or major hazards	✓	✓		
Fence around pool intact	✓	✓		
Check for signs of rodents, bats, snakes, lizards	✓	✓		
Drain outdoor faucets and hoses	✓	✓		
Check window seals and other drainage	✓	✓		
Clean gutters and downspouts	✓	✓		
<b>Basement &amp; Crawlspace</b>				
No wet surfaces, mold/mildew	✓	✓		
Sump pump and check valve working	✓	✓		
Floor drains working	✓	✓		
Vacuum basement surfaces	✓	✓		
Check for signs of rodents, bats, snakes, lizards	✓	✓		
<b>Exterior Roof, Walls, Windows - check for leaks</b>				
Sealants in gasket concealed	✓	✓		
Check chimney, soffit, plumbing vents, skylight flashing	✓	✓		
Make sure gutters discharge water away from building	✓	✓		
Check attic vents	✓	✓		
Check attic for signs of rod infestation	✓	✓		
Check for exterior roof damage	✓	✓		
Look for peeling paint, abraded areas	✓	✓		
Look for signs of leaks where deck attaches to house	✓	✓		
Check below window & door for flashing defect	✓	✓		
Repair broken, cracked glass	✓	✓		
Look for signs of leaks at window and door sills	✓	✓		
Clean after vent	✓	✓		
Check exhaust ducts are clear	✓	✓		

Maintenance Checklist continued on back

## Lead and Lead-Based Paint

- Peeling, Chipping Paint / Deteriorated Paint
- Dust
- Soil
- Drinking water
- Consumer Products such Pottery, Cribs, Jewelry, Candle Wicks
- Cultural Items
- Contaminated Sites



## Why Avoid Lead?

- Reduced IQ
- Learning disabilities
- Impaired hearing
- Reduced attention spans, behavior problems
- Anemia
- Kidney damage
- Damage to central nervous system
- Coma, convulsions, death

## Peeling paint outside



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## Lead: Age of Housing Matters

Year House Was Built	Percent of Houses with Lead-Based Paint
Before 1940	87 percent
1940-1959	69 percent
1960-1978	24 percent
All US Housing Stock	40 percent



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## Prevalence on Deteriorated Paint - 2007

- 2% of homes have broken plaster or peeling paint
- Conditions that Deteriorate Paint
  - 17.5% of homes exterior problems that can deteriorate paint.
  - In past twelve months,
    - 7.9% of homes had interior water damage
    - 10.3% of homes had exterior water damage



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## Available Testing

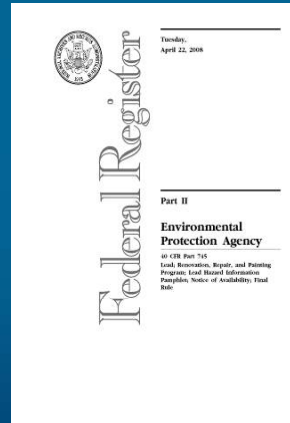
- Paint chip
- Dust - Clearance testing
  - 40 micrograms of lead per square foot on floors
  - 250 micrograms of lead per square foot on window sills.
- Bare soil
  - 400 ppm in play areas
  - 1200 ppm in other areas
- Drinking water



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## EPA Lead Renovation, Repair and Painting (RRP) Rule

- Effective April 22, 2010
- Applies to pre-1978:
  - Target Housing (same as disclosure rule)
  - Child-occupied facilities
- Triggers:
  - Compensation
  - Paint disturbance (a/k/a renovation)
- 40 CFR 745.80 to 745.91
- April 22, 2008 *Federal Register*



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## Impacts of RRP Rule

- 8.4 million renovation events annually
  - Impact may drop to 4.4 million events
- Requires certification of:
  - 210,000 renovation firms by EPA after October 22, 2009
  - 235,000 individuals by accredited trainers after April 22, 2009
- Estimated by EPA to add \$35 per job



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## Why Now?

- Required by the Residential Lead-based Hazard Reduction Act of 1992
- Congress required rule to be finalized in 1996
- Still to come:
  - Public buildings built before 1978
  - Commercial buildings that create lead-based paint hazards



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## Lead-Based Paint Rules

EPA/HUD Lead Disclosure Rule – 1996

Sale or lease of target housing

EPA Renovation, Repair, and Painting (RRP) Rule – 2010

Renovation of target housing or child-occupied facility

Hazard Standards – 2001

Lead in paint, dust, and soil

Lead-based Paint Activities Rule – 1996

Standards for:

- Abatement
- Risk assessment
- Lead inspection

EPA Pre-renovation Education Rule – 1999 and 2008

HUD Lead-safe Housing Rule – 1999

Federally-assisted Housing

OSHA Construction Standard - 1992



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## EPA Resources



- [www.epa.gov/lead](http://www.epa.gov/lead)
- [www.epa.gov/lead/pubs/renovation.htm](http://www.epa.gov/lead/pubs/renovation.htm)

Also  
[www.hud.gov/lead](http://www.hud.gov/lead)



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## So What Will Change?

- "Certified Renovation Firm" Disturbs Paint
  - EPA or State Certification (after 10/22/09)
  - Fees and five-year renewal
- "Certified Renovator" Supervises Work
  - One-day training (after 4/22/09)
  - Certified by EPA-Approved Training Provider
  - Five-year renewal
- Mandatory Work Practices
  - Isolate work area
  - Contain dust
  - Thoroughly clean-up work area for debris and dust
- Post-renovation Cleaning Verification
- Documentation!

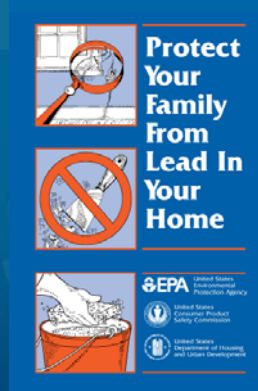


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## A New Booklet

Only for Leases and  
Sales of Target Housing



For Renovations in Target  
Housing and Child-occupied  
Facilities



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## How clean is clean?

- Clearance testing for lead
  - 40 micrograms of lead per square foot on floors
  - 250 micrograms of lead per square foot on window sills.



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## Lead Disclosure

- At property transfer, provide buyer/renter:
  - Lead warning statement
  - Summary of information on lead hazards (yes, no, don't know)
  - Documents on specific information about lead-based paint and lead hazards.
  - Tenant signature
- Rentals
  - Common Area results must be disclosed to all tenants.
  - At lease signing
  - Applies to oral leases.
  - Federal courses teach:



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## Cleaning Verification Card



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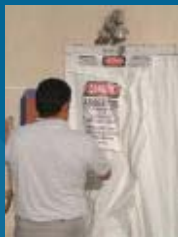
## Housing Code Provisions Related to Paint

- **304.2 Protective treatment.**
  - All exterior surfaces, including but not limited to, doors, door and window frames, cornices, porches, trim, balconies, decks and fences shall be maintained in good condition.
  - Exterior wood surfaces, other than decay-resistant woods, shall be protected from the elements and decay by painting or other protective covering or treatment.
  - Peeling, flaking and chipped paint shall be eliminated and surfaces repainted.
- **304.6 Exterior walls.** All exterior walls shall be free from holes, breaks, and loose or rotting materials and maintained weatherproof and properly surface coated where required to prevent deterioration.
- **305.3 Interior surfaces.** All interior surfaces, including windows and doors, shall be maintained in good, clean and sanitary condition. Peeling, chipping, flaking or abraded paint shall be repaired, removed or covered. Cracked or loose plaster, decayed wood and other defective surface conditions shall be corrected.



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## Asbestos



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## Why avoid asbestos?

- Health effects:
  - Lung Cancer
  - Mesothelioma
  - Asbestosis
- Smokers are at greater risk!



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## How to handle asbestos

- LEAVE IT ALONE (if in good condition).
- Look for signs of wear or damage such as tears, abrasions, or water damage but avoid touching the material.
- If damaged or renovation might disturb it, repair or removal by a licensed professional is needed.



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## Vermiculite



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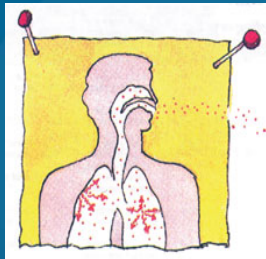
## Asbestos Regulations

- National Emission Standard for Hazardous Air Pollutant (NESHAP)
  - Applies to buildings with more than 4 units
  - Work practices, training and notice to EPA
- Model Asbestos Program for States
  - Applies to buildings with more than 10 units
  - Work practices and training
- EPA's Ban on Asbestos in Products Reversed in 1992



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## Radon – A Serious Health Concern

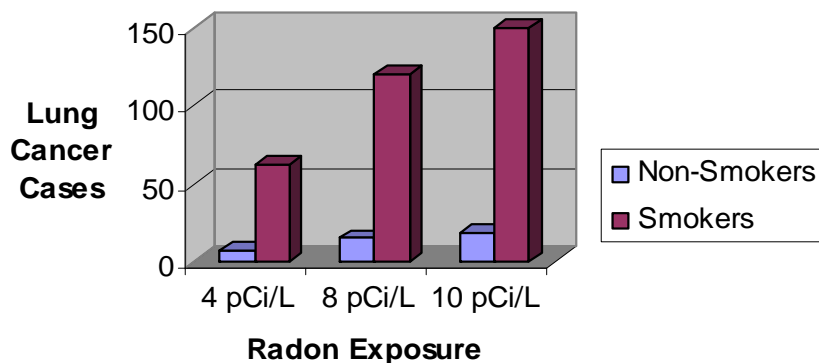


- Radon is a naturally occurring gas produced by the breakdown of uranium and radium in ground.
- Radon
  - 2<sup>nd</sup> leading cause of lung cancer after smoking with more than 20,000 deaths annually
  - Leading cause of lung cancer in nonsmokers and people who have never smoked.



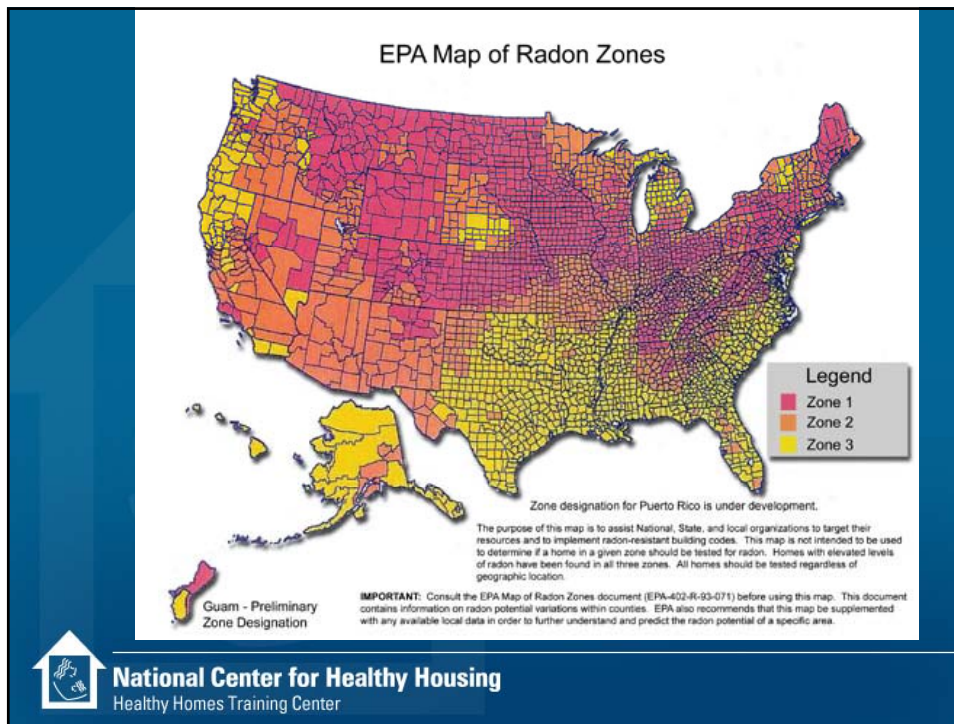
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**Estimated Lung Cancer Cases In a Population of 1,000**




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## How Radon Gets into a Home

1. Cracks in solid floors
2. Construction joints
3. Cracks in walls
4. Gaps in suspended floors
5. Gaps around service pipes
6. Cavities inside walls
7. Other openings
8. Water supply

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## Testing for Radon

- Short Term
  - Minimum 48 hours - \$10-\$20
  - Useful results (home sales, rental, occupancy)
- Long Term
  - 91 days to 1 yr - \$20-\$30
  - Better indicator of need to mitigate
- If result is 4 pCi/L or higher take a follow-up test OR fix the home



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## Testing for Radon

### Testing Options:

- For kits call 1-800-SOS-RADON, purchase retail, or from certified company
- Hire a professional



**Radon Data Card**  
(Print Comments on Back)

In order to Analyze test, all information must be filled out completely.  
Please Print (Circle Color Under Lab Code No. 00-0000)

Name John Smith Phone 123 456 7890

Address 12345 Main St, Apt 100 County MD

City Washington State MD Zip 20001

Room Used For Testing Room Basement Other \_\_\_\_\_

Room Level Basement 1st Floor 2nd Floor 3rd Floor \_\_\_\_\_

(Right) Cap Retrieved Date 1/1/2020 Time 10:00 AM (Print Test)

(Print) Cap Retrieved Date 1/1/2020 Time 10:00 AM (Print Test)

# Testing Address Office (For mailing address please use below)

12345 Main St, Apt 100  
WASHINGTON DC 20001

ATTN: RGLP



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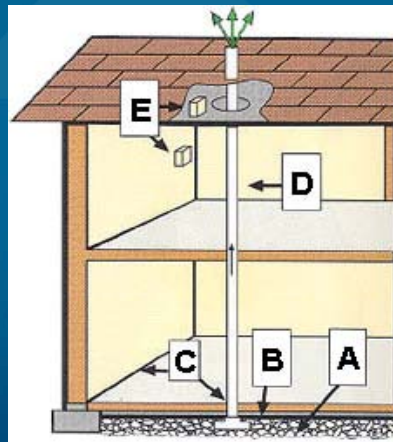
## Radon Reduction Systems

- New Construction
  - Passive Sub-Slab Depressurization System
  - Active Sub-Slab Depressurization System
- Existing Housing
  - Active Sub-Slab Depressurization System



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## Passive Sub-Slab Depressurization System (New Construction)

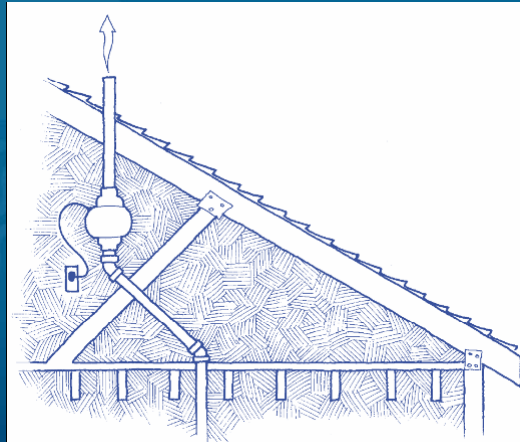


- A. Gas-Permeable Layer
- B. Plastic Sheetting
- C. Seal and Caulk
- D. Vent Pipe
- E. Junction Boxes



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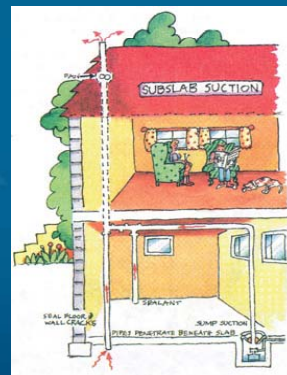
## Fans Makes It An Active System



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## Radon Fixes: Existing Housing

- Seal floor and cracks
- Vent radon gas from below slab
- Fan sucks air from below slab – active system
- Sump suction reduces radon gas entry



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## Label Radon Systems



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## Radon Mitigation Costs

	Average Costs
<b>New Construction</b>	
- Passive only	\$350 - \$500
- Active system	\$650 - \$800
<b>Existing Homes</b>	\$800-\$2,500



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## Finding a Qualified Contractor

- Contact
  - State radon offices
  - EPA's web site  
[www.epa.gov/radon/proficiency.html](http://www.epa.gov/radon/proficiency.html)
- 2 Private National Proficiency Programs
  - National Environmental Health Association (NEHA) [www.neha-nrpp.org/](http://www.neha-nrpp.org/)
  - National Radon Safety Board (NRSB) [www.nrsb.org](http://www.nrsb.org)



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## Resources

- State Radon Contacts
  - [www.epa.gov/iaq/whereyoulive.html](http://www.epa.gov/iaq/whereyoulive.html)
- Coupons for Test Kits - 800-SOS-RADON (767-7236)
- Radon Mitigation - 800-644-6999
- Other Questions - 800-55RADON (557-2366)
- IAQ Questions - 800-438-4318



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## Sewer Gas

- A mixture of gases generated by bacteria and fungi while digesting wastes
- Often contains methane, hydrogen sulfide, ammonia, carbon dioxide, and carbon monoxide
- Source - Dried out traps in drains, especially in floor drains or homes that have been vacant for awhile.



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## Key Messages

- Systems should be inspected regularly to ensure proper function.
- Some maintenance activities require the use of trained professionals.



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