
Radon and a Healthy Home:

Radon Measurement
and Mitigation Basics

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Division of Public Health
Department of Health Services





Amanda Koch, MPH

- Began Radon Program Manager position in May 2024
- 9th year at the WI DHS in environmental public health
- Chicago native, UW-Madison alum



Effigy Mounds National Monument
Harpers Ferry, IA

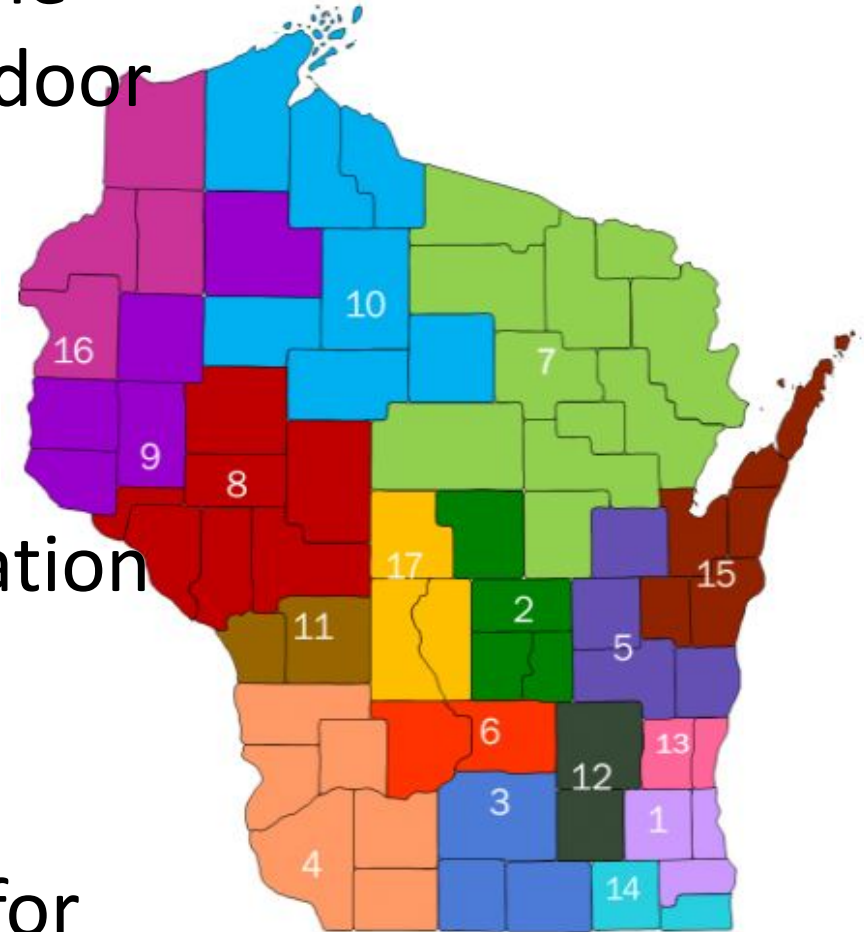
DHS Indoor Radon Program

DHS receives funding from the U.S. EPA's State and Tribal Indoor Radon Grant.

DHS leads statewide radon outreach and education.

DHS funds 17 Radon Information Centers (RICs) throughout Wisconsin.

RICs serve as local resource for radon expertise and reduced-cost test kits.





Topics We'll Cover

- Radon basics
- Health effects from radon exposure
- Testing for radon
- Controlling radon in homes

Radon Basics

- What is radon?
- Where does it come from?
- What are the health effects?



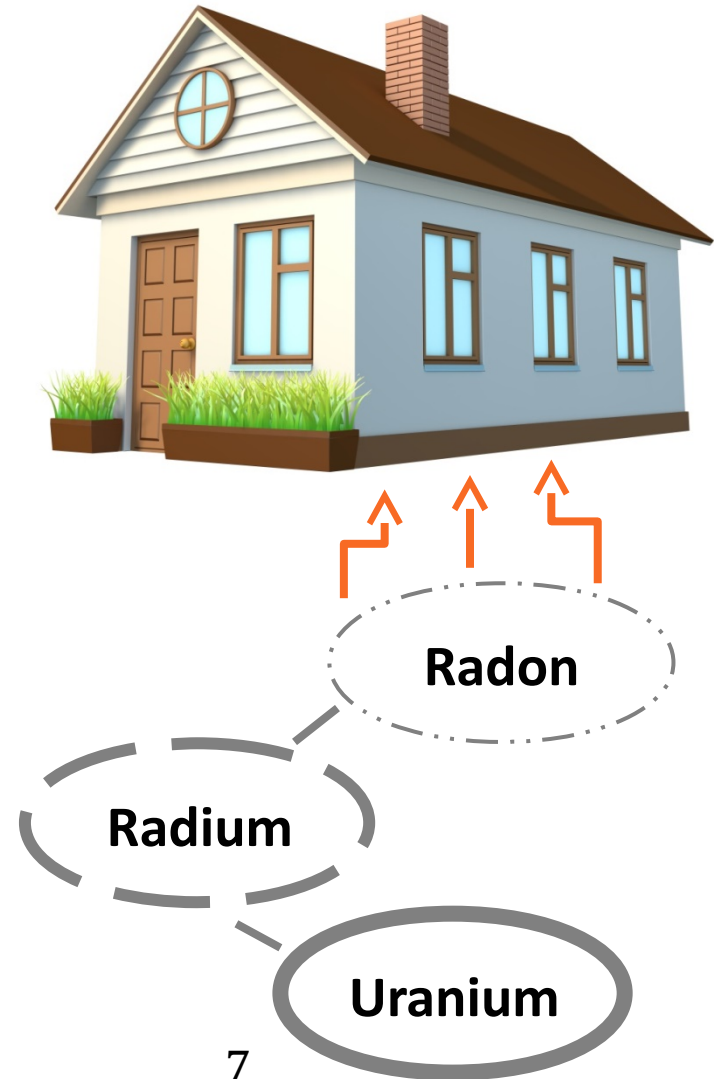
What is Radon?

- A colorless, odorless, radioactive gas that comes from the natural breakdown of uranium in the ground.
- Found all over the world and across Wisconsin.
- Average outdoor level: 0.4 pCi/L
Average indoor level: 1.25 pCi/L
- Found in all types of buildings, old and new.



Where does radon come from?

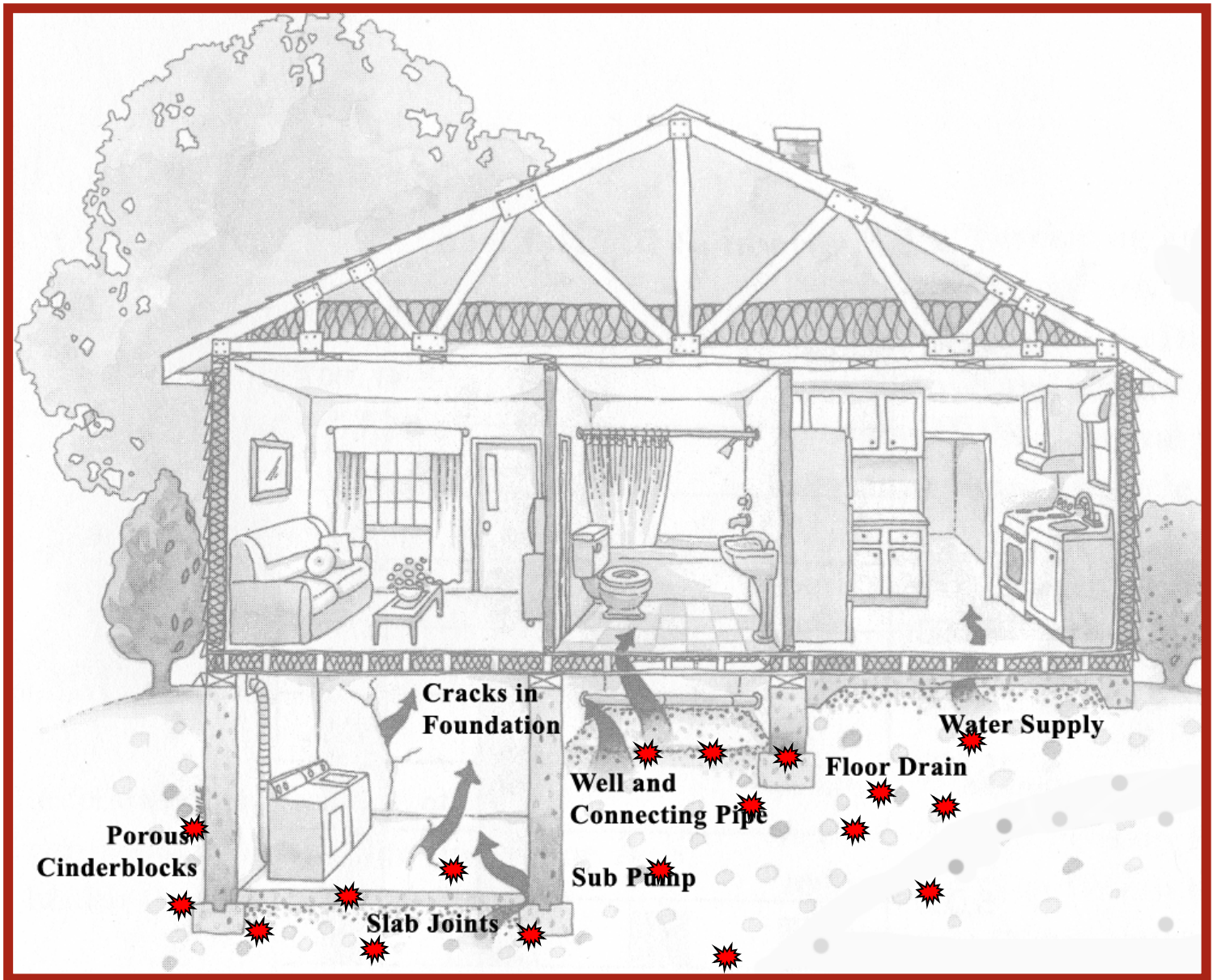
- Radon comes from the natural radioactive decay of uranium in the Earth's crust.
- Radon gas can enter homes through cracks and openings.
- High radon levels build up inside homes and buildings.
- About 1 in 10 homes in Wisconsin has high radon levels.



Factors that Influence Radon Levels

- How much uranium/radium is in the soil.
- Porosity of the soil (e.g., sand vs. clay).
- House construction including foundation type: basement, crawlspace, slab-on-grade.
- Weather conditions: Levels are higher during winter heating season.
- Occupant activity.





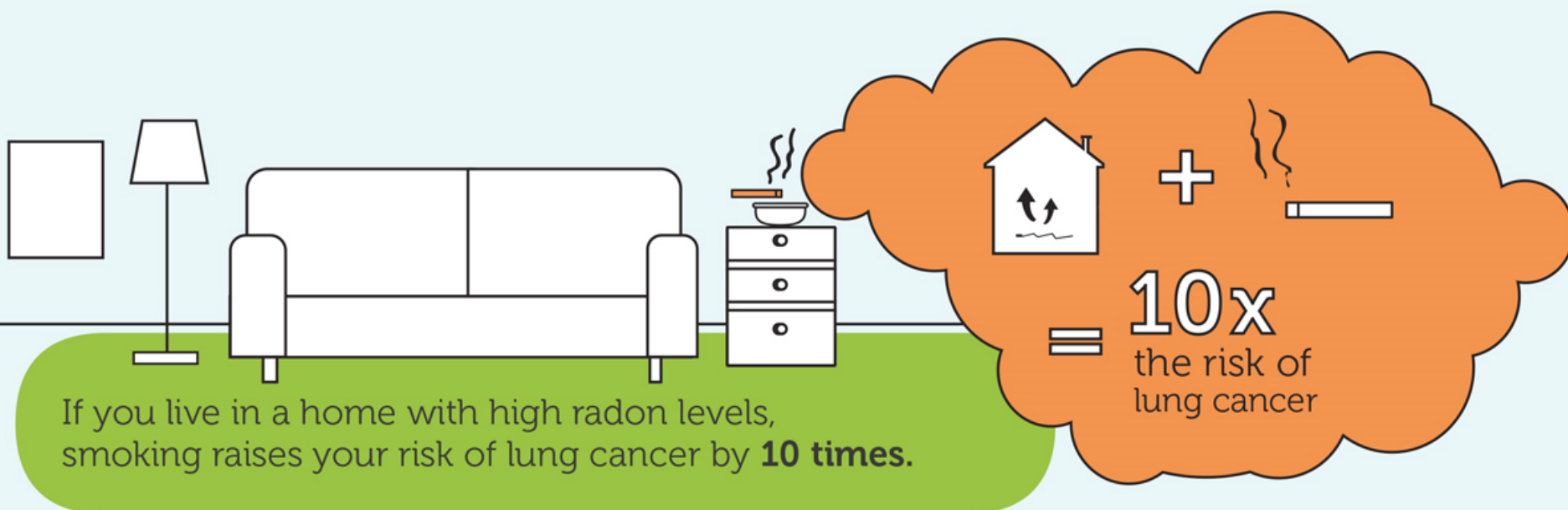
Health Effects from Radon Exposure

- Radon is a class “A” carcinogen.
- Breathing in high levels of radon over long periods of time can cause lung cancer.
- Radon does NOT cause any short-term health effects such as coughing, headaches, or shortness of breath.
- EPA estimates 21,000 lung cancer deaths are caused by radon each year.

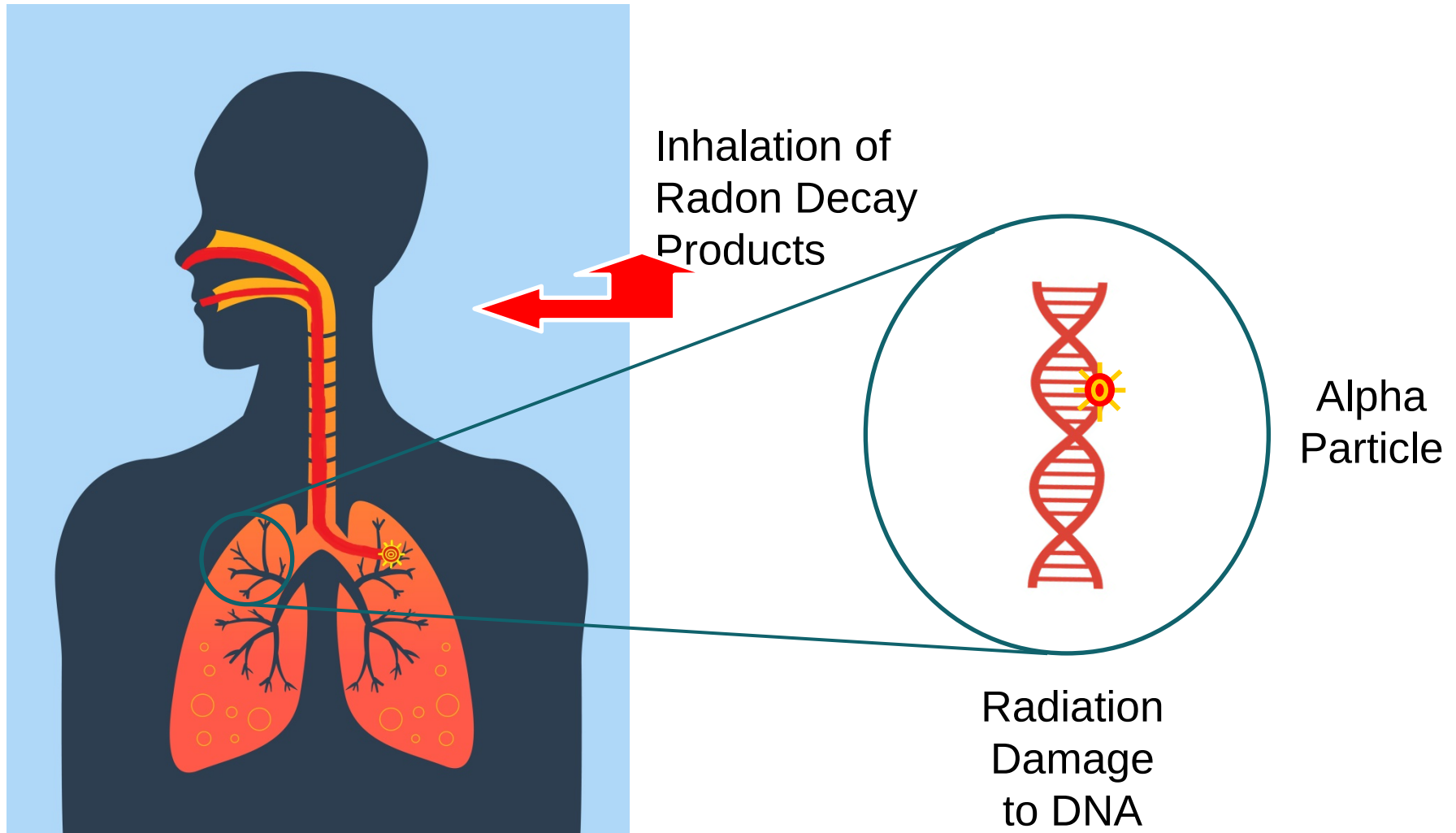


Health Effects from Radon Exposure

Radon and Smoking: A Dangerous Combination



How Radon Causes Lung Cancer



Testing for Radon

- Overview
- Radon Test Kits
- Radon Maps



Testing for Radon

- Radon is measured in picocuries per liter (pCi/L).
- EPA Action Level: 4 picocuries per liter (pCi/L)
- Mitigation (fixing) recommended for radon levels above 4 pCi/L.
- Two types of radon tests:
 - **Short-term test**
 - Long-term test



Testing is the ONLY way to know your home's radon levels



100 pCi/L



?



1.25 pCi/L

Radon Tests



**ALPHA ENERGY
LABORATORIES**

RADON SAMPLER

**DO NOT REMOVE, TEAR, OR
PUNCTURE THIS PAPER**

THIS SIDE MUST FACE UPWARD DURING TESTING

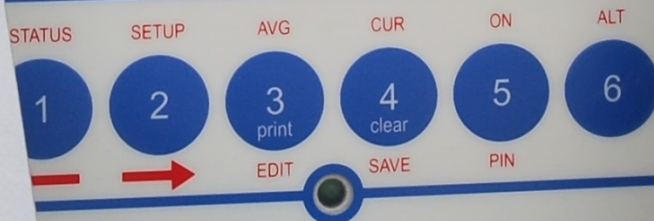
CONTENTS: ACTIVATED CHARCOAL
Manufactured by Alpha Energy Laboratories

1029

CONTINUOUS RADON MONITOR



UNIT 2



AT END OF TEST - REMOVE AND DISCARD THE FOAM PLUG AND THE PLASTIC HOOK TO SEAL: REMOVE PROTECTIVE STRIP FROM INSIDE OF THIS FOR MAXIMUM TEST ACCURACY, SHIP TO THE LAB IMMEDIATELY

THIS AND READ

BE FINALIZED IF ANY INFORMATION IS MISSING AND THERE MAY BE IF THE LABORATORY HAS TO REQUEST AND ADD THE MISSING DATA

WARNING

WWW.RADON.COM

NEW ANIMATED TEST INSTRUCTIONS AT OUR WEB SITE:

FULLY LOOK AT AND READ THE INSTRUCTIONS? YES NO

1ST TIME FOLLOW-UP REAL ESTATE POST-MITIGATION? YES NO

WERE THE CRAWL SPACE VENTS CLOSED? N/A YES NO

HOUSE CONDITIONS MAINTAINED DURING TEST? YES NO

BASEMENT 1ST AND OTHER ROOM TESTED? YES NO

TEST 40 50 60 70 80 IF OVER 85 DON'T TEST

TEMPERATURE OF THE AREA TESTED WAS: (+/- 5 degrees F)

YOUR ANSWERS TO EACH QUESTION BELOW:

24 HR. FORMAT

CLOCK

ENDING CLOCK

NOTICE!

CLOCKS ARE IN

PLEASE PRINT CLEARLY: NAME

PLEASE PRINT CLEARLY: TEST ADDRESS

PLEASE PRINT CLEARLY: CITY, STATE, ZIP

PLEASE PRINT CLEARLY: PHONE NUMBER

PLEASE PRINT CLEARLY: FAX #

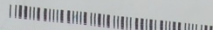
DATE

Jan 2016

USE BY

Short-Term Test

- Recommended by EPA to begin with a short-term test.
- Kits contain activated charcoal.
- Test runs for 2 to 7 days.
- Best time to test is during winter heating season.
- Placed in lowest livable area of home (e.g., basement).
- **Follow kit instructions.**

6622053  USE BY Jan 2016

TEST RESULTS FOR THIS KIT MAY BE AVAILABLE AT OUR WEB SITE. radon.com. AFTER THE SAMPLE IS ANALYZED.

DATE 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31

PLEASE PRINT CLEARLY: NAME _____

PLEASE PRINT CLEARLY: TEST ADDRESS _____

PLEASE PRINT CLEARLY: CITY, STATE, ZIP _____

NEED YOUR TEST RESULTS ASAP? THEN CAREFULLY PRINT AN E-MAIL ADDRESS ON PAGE 2

STARTING CLOCK NOTICE: CLOCKS ARE IN 24 HR. FORMAT ENDING CLOCK

CIRCLE YOUR ANSWER(S) TO EACH QUESTION BELOW:

THE AVERAGE TEMPERATURE OF THE AREA TESTED WAS: (+/- 5 degrees F)
IF BELOW 35 DON'T TEST 40 50 60 70 80 IF OVER 85 DON'T TEST

FLOOR TESTED: BASEMENT 1ST 2ND OTHER ROOM TESTED _____

WERE CLOSED HOUSE CONDITIONS MAINTAINED DURING TEST? YES NO

IF APPLICABLE, WERE THE CRAWL SPACE VENTS CLOSED? YES NO

TESTING FOR: 1ST TIME FOLLOW-UP REAL ESTATE POST-MITIGATION

DID YOU CAREFULLY LOOK AT AND READ THE INSTRUCTIONS? YES NO
YOU CAN VIEW ANIMATED TEST INSTRUCTIONS AT OUR WEB SITE: WWW.RADON.COM

WARNING: ANALYSIS CANNOT BE FINALIZED IF ANY INFORMATION IS MISSING AND THERE MAY BE AN EXTRA CHARGE IF THE LABORATORY HAD TO REQUEST AND ADD THE MISSING DATA.

AND READ THIS

AT END OF TEST - REMOVE AND DISCARD THE FOAM PLUG AND THE PLASTIC HOOK

DO NOT REMOVE, TEAR, OR PUNCTURE THIS PAPER



Advice for Humanists

Always use an approved device:

<https://nrpp.info/devices/approved-devices/>

- Approved devices must undergo routine performance testing including calibration.
- Approved devices tend to have readily available user support.



Monitor Technologies Radon Alarm Micro-printer Professional Model MTL103 for 102

Worldwide Home and Electronics (10989)
99.7% positive · [Seller's other items](#) · [Contact seller](#)

US \$59.95
or 4 interest-free payments of \$14.99 available with **Klarna**. [Learn more](#)

Condition: **Used** ⓘ
"SELLING UNTESTED"

[Buy It Now](#)

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Additional service available
☐ 1-year protection plan from Allstate - **\$10.99**

🔗 People are checking this out. 5 have added this to their watchlist.

Advice for Humanists

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Interpreting Results

- If initial test is <4 pCi/L:
 - Test again in 2-5 years or after major renovations.
- If initial test is between 4-7 pCi/L:
 - Follow up with **long-term** test or a 2nd short-term test if results are needed quickly.
- If initial test is above 8 pCi/L:
 - Follow up with a 2nd short-term test.
 - Average two tests.

6622053

USE BY Jan 2016

TEST RESULTS FOR THIS KIT MAY BE AVAILABLE AT OUR WEB SITE. radon.com. AFTER THE SAMPLE IS ANALYZED.

PLEASE PRINT CLEARLY: NAME _____

PLEASE PRINT CLEARLY: TEST ADDRESS _____

PLEASE PRINT CLEARLY: CITY, STATE, ZIP _____

NEED YOUR TEST RESULTS ASAP? THEN CAREFULLY PRINT AN E-MAIL ADDRESS ON PAGE 8

STARTING CLOCK

NOTICE: CLOCKS ARE IN 24 HR. FORMAT

ENDING CLOCK

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WARNING

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ON MAXIMUM TEST ACCURACY, SHIP TO THE LAB IMMEDIATELY.

TO SEAL: REMOVE PROTECTIVE STRIP FROM INSIDE OF THIS OPENING

AT END OF TEST - REMOVE AND DISCARD THE FOAM PLUG AND THE PLASTIC HOOK

AND READ THIS



EPA Map of Radon Zones

Overview

Test kits

**Radon
maps**

EPA Radon Zones (with State Information)

DISCLAIMER: The purpose of this map is to assist national, state and local organizations to target their resources and to implement radon-resistant building codes. This map is not intended to be used to determine if a home in a given zone should be tested for radon. Homes with elevated levels of radon have been found in all three zones. All homes should be tested regardless of geographic location. EPA recommends that this map be supplemented with any available local data in order to further understand and predict the radon potential for a specific area.

To learn more about radon, visit [EPA's Radon Website](#).

For radon information in locations outside of the continental United States please use the links below to view each location on the map.

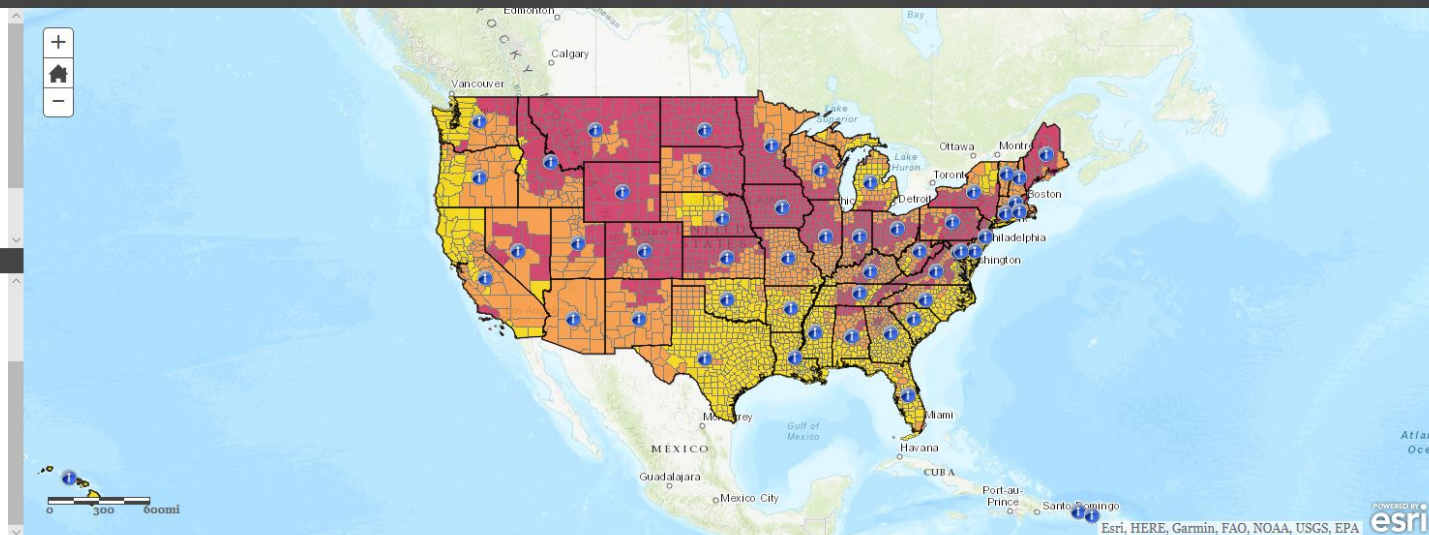
Hawaii
Guam
Puerto Rico
Virgin Islands

LEGEND

Radon Zones by County

Radon Data

- Zone 1: Counties with predicted average indoor radon screening levels greater than 4 pCi/L
- Zone 2: Counties with predicted average indoor radon screening levels from 2 to 4 pCi/L
- Zone 3: Counties with predicted average indoor radon screening levels less than 2 pCi/L



Guam - Preliminary Zone designation



Zone 1

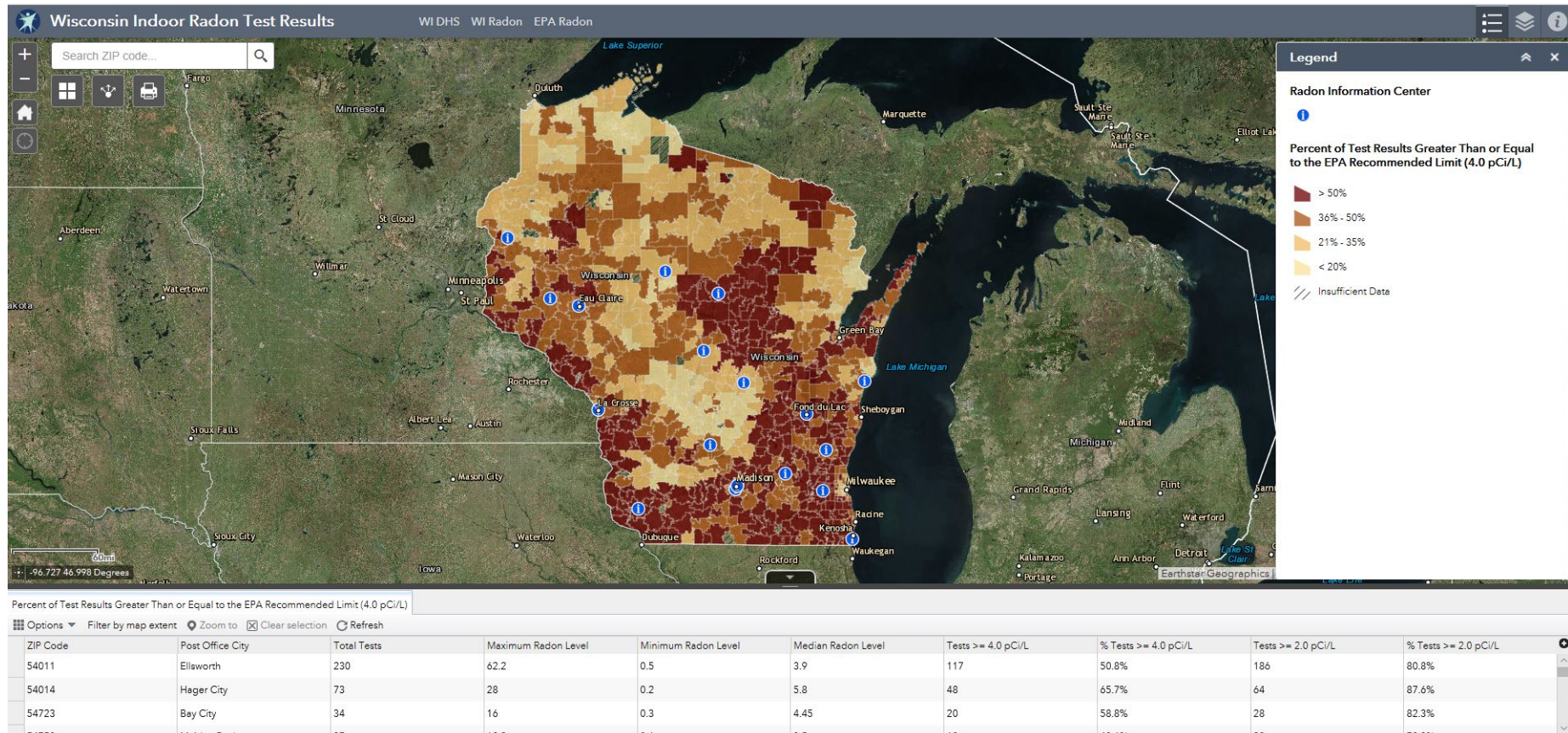


Zone 2



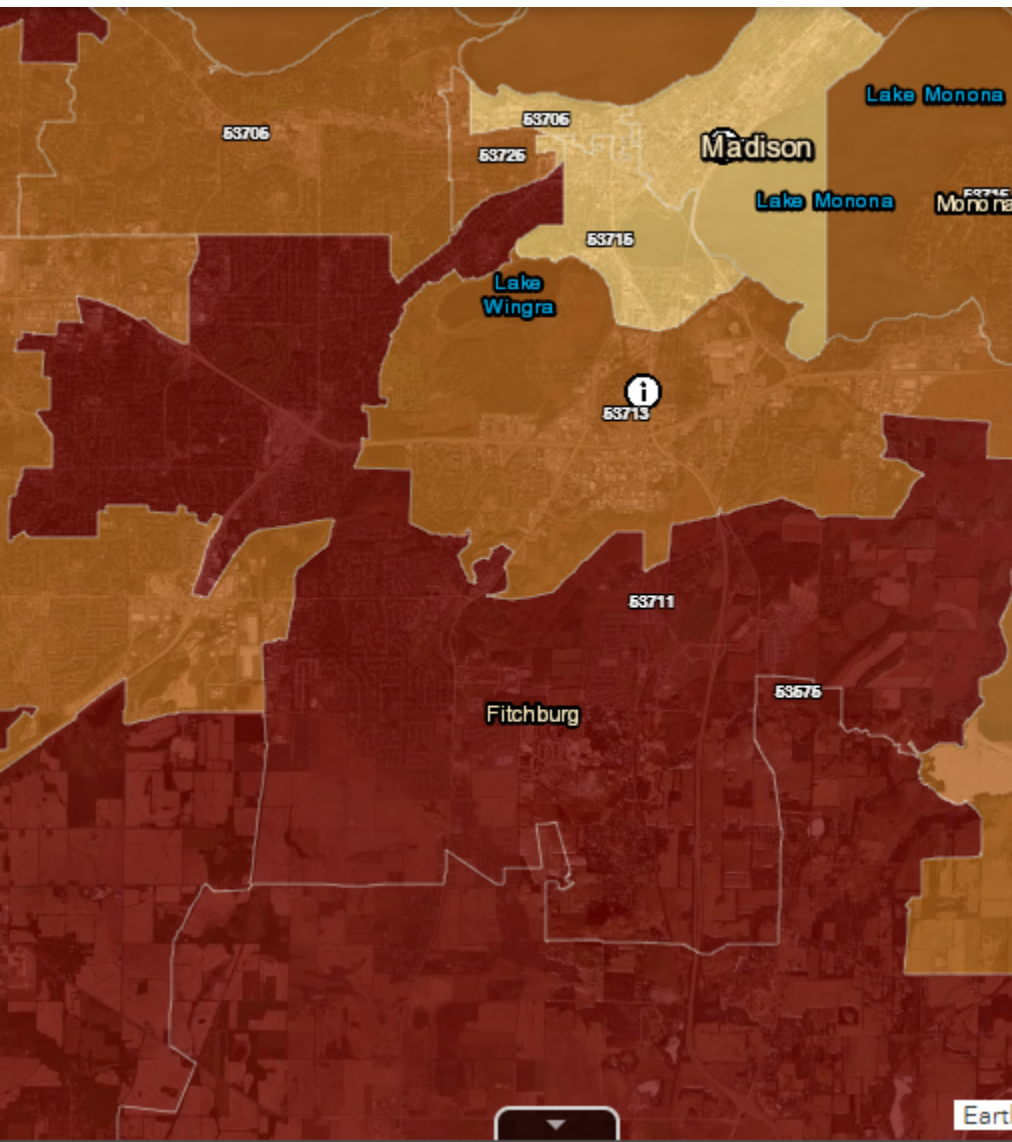
Zone 3

WI Radon Map



www.lowradon.org

53711



Our data show that of 645 homes tested:

- 50.2% of homes tested at or above 4 pCi/L
- Median radon level: 3.55 pCi/L
- Maximum recorded radon level: 60.1 pCi/L

Radon Control

Radon Mitigation
Common
Methods



Radon Mitigation

- Any process used to reduce radon concentrations in homes or buildings.
- Goal = reduce indoor radon levels below EPA action level of 4 pCi/L.
- In most cases levels can be reduced below 2 pCi/L.

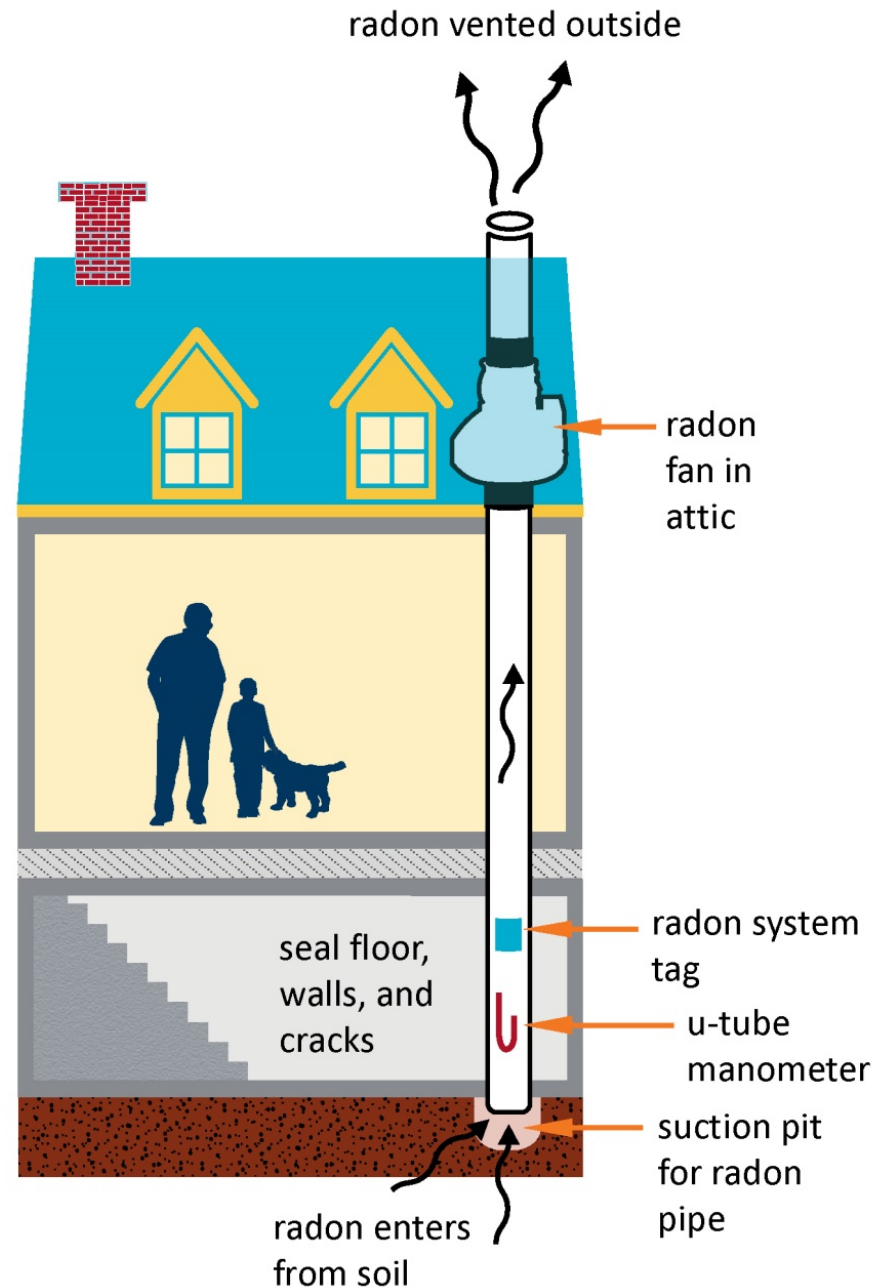


Common Mitigation Methods

- Most commonly installed system is called “active sub-slab depressurization.”
- System is simple, effective, and energy-efficient.
- Uses plumbing-type PVC pipe and a small fan to remove radon.



How It Works



Can't I Just Seal Cracks & Open Windows?

- Sealing alone is NOT enough.
- Opening doors and windows to dilute radon gas may sometimes be effective, but it is NOT a practical, long-term solution.





A: From your regional Radon Information Center, which is housed at **Public Health Madison–Dane County**.

Q: Where can I buy an approved test kit?

To buy a \$10 test kit (cash or check only):

- Pick up a test kit at one of these locations:
 - Atrium Office: **2300 S. Park St., Suite 2010**
 - East Washington Avenue Office: **2705 E. Washington Ave.**
- Send a check made out to Madison City Treasurer to Public Health Madison & Dane County (Attn: Radon Program) at 2300 S. Park Street, Room 2022, Madison, WI 53713



Questions?

**Your regional Radon Information
Center (Public Health Madison-
Dane County):**

608-243-0392

Your State Radon Program:

DHSradon@dhs.wisconsin.gov

608-266-7199

www.lowradon.org