



RADON BASICS & POLICIES

Indoor Air Unit | Radon Program

Partner Meeting, November 16, 2021

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Agenda:

Health

Testing

Mitigation

Laws



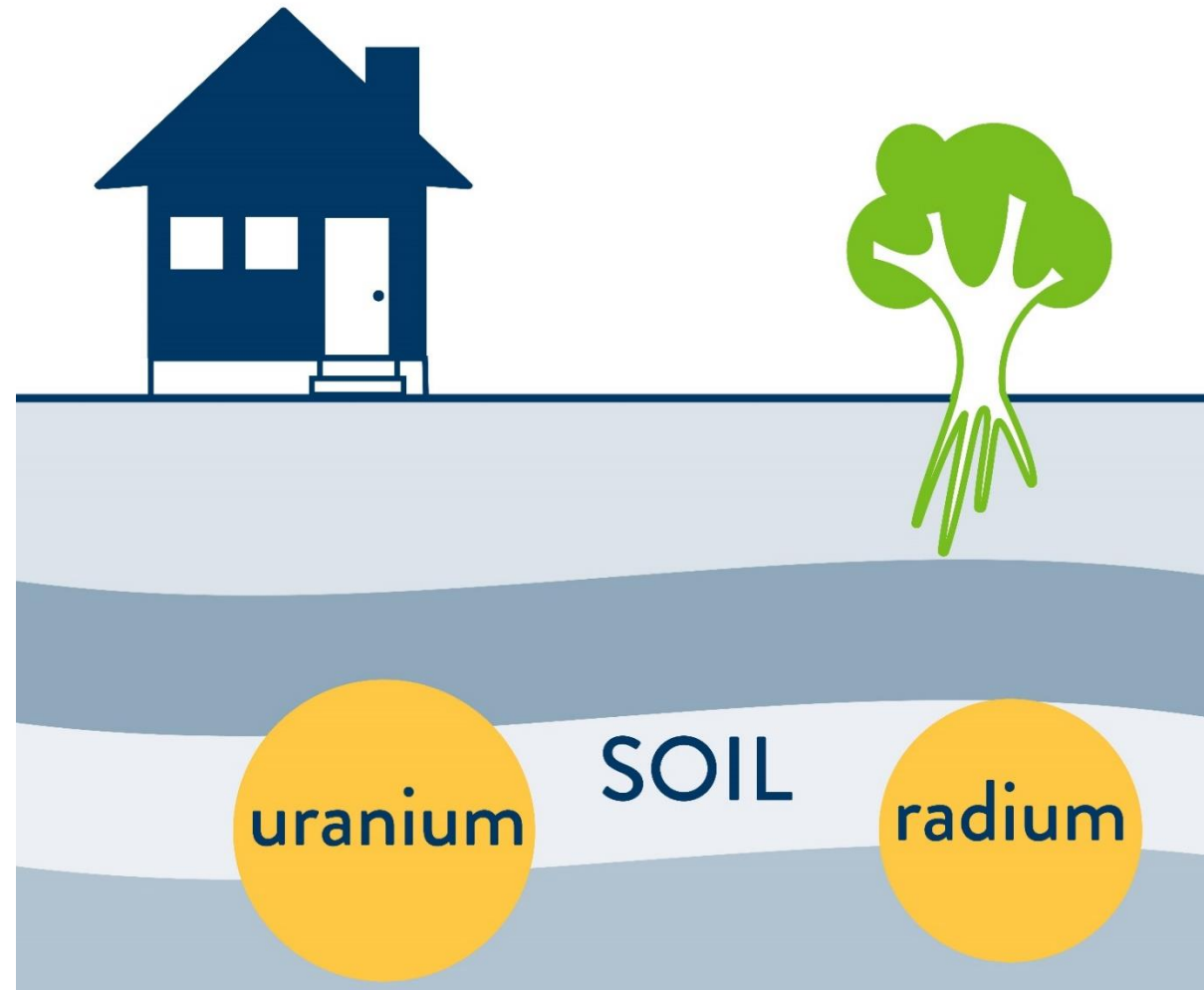
Health & Levels

10/18/2022

MDH Indoor Air | mn.gov/radon

Where is radon found?

- Soil
 - Major source in Minnesota
- Water
- Air



Health Effects

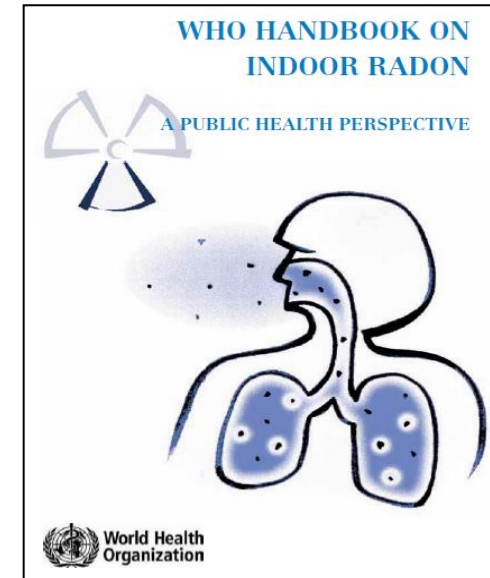
Second leading cause of lung cancer in the U.S.



*EPA Assessment of Risks from Radon in Homes (June 2003, EPA-402-R-30-0003)

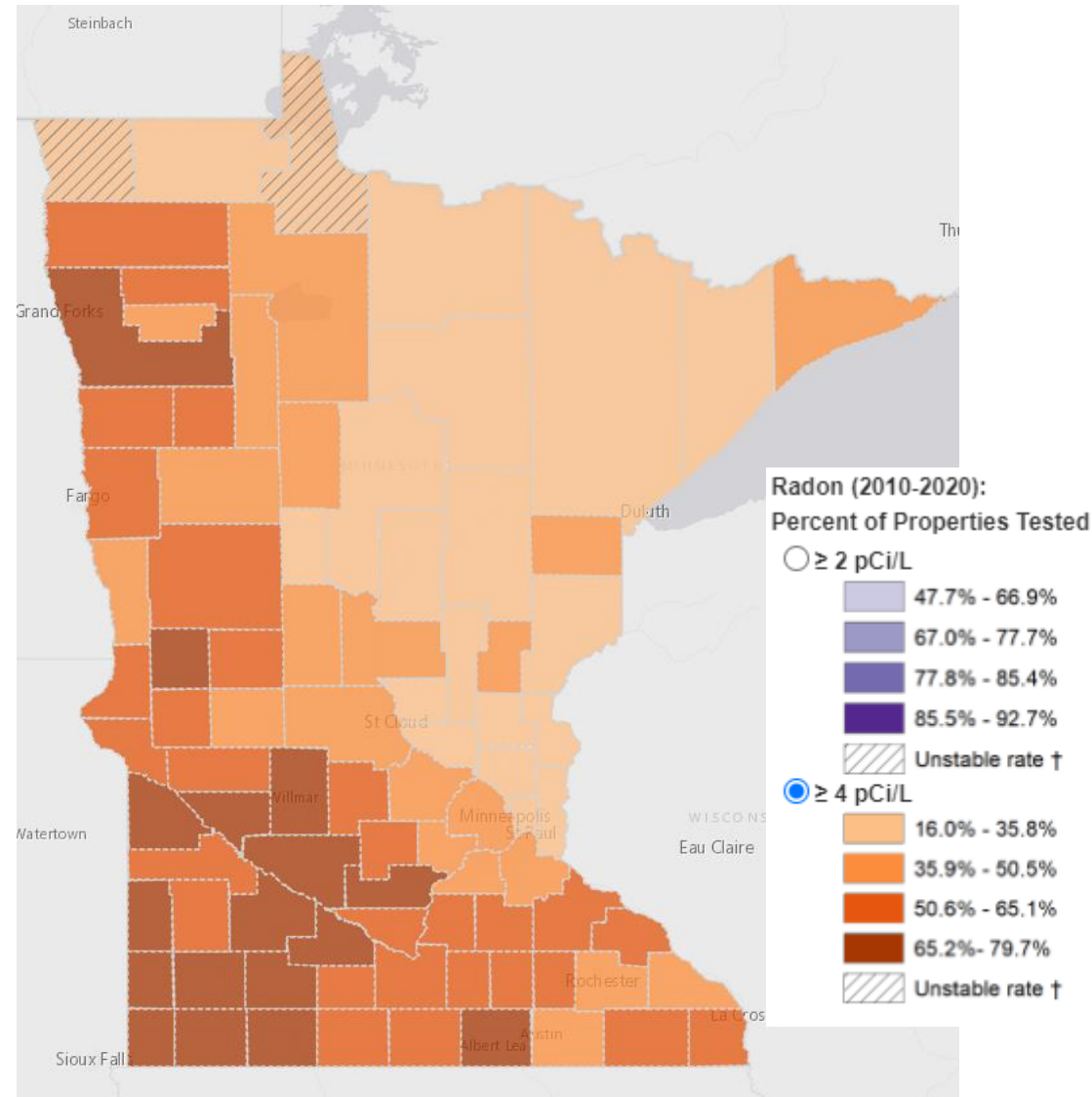
What Level is Elevated?

- There is **no known safe level** of radon
 - Goal: as low as reasonably achievable
- World Health Organization (WHO):
 - 2.7 pCi/L health based standard
- Environmental Protection Agency (EPA):
 - 2 pCi/L (unofficial recommendation)
 - 4 pCi/L (official action level)



Radon Maps

- Mean=4.2 pCi/L
 - 228,000+ properties
- Other maps / graphs
 - Summer (3.5) vs Winter (4.6)
 - Testing rates by census tract
 - Disparities in testing and mitigation



How does radon enter a home?

Air Pressure



Stack Effect:

As warm air leaves the top of the house, air comes in the bottom of the house



Down Wind Draft Effect:

Wind flowing over the top of a house creates the same effect as the stack effect



Vacuum Effect:

Air mechanically exhausted from the house is replaced from other pathways

Stack Effect





Testing

Test devices

Short-term Test:

Measure radon levels for 2-7 days



Long-term Test:

Measure average radon levels over 90-365 days



General Home Testing Process

Initial short-term test

Result (pCi/L)

Action

0 – 1.9

Retest every 2 to 5 years with a short-term test

2 – 8

Perform a follow-up long-term test

Greater than 8

Perform a follow-up short-term test



Second test

(either short or long-term test)

Result (pCi/L)

Action

0 – 1.9



Retest every 2 to 5 years*

2 – 3.9



Consider a radon mitigation system

4 or greater



Highly recommend a radon mitigation system

** If the initial test was 8 pCi/L or above, consider performing a long-term test.*

Time sensitive (e.g., real estate) Simultaneous Testing

- 2 short-term tests placed side by side
 - 4-8 inches apart
 - 48 hour minimum
 - Sent in for lab analysis
 - Average two tests to determine next step



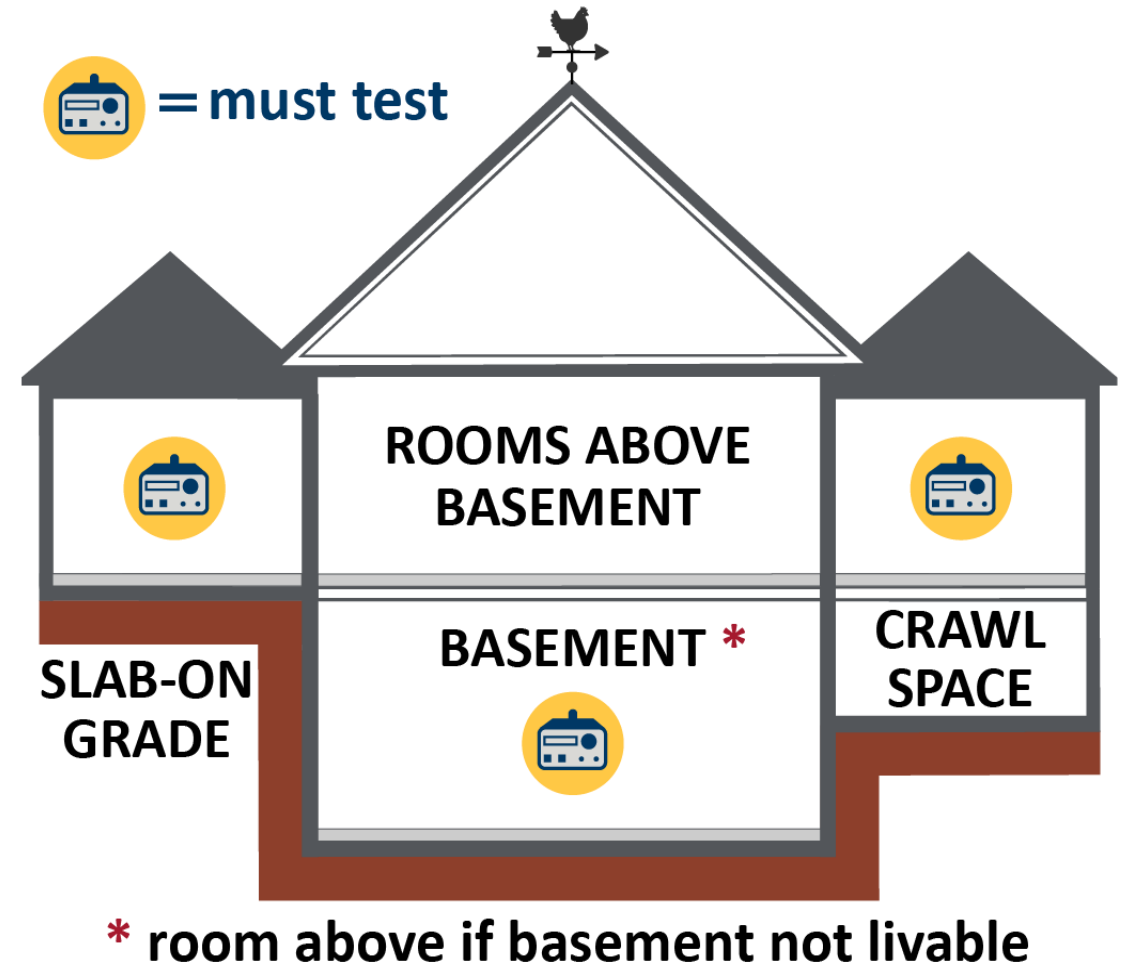
Time sensitive (e.g., real estate) Continuous Radon Monitor Testing

- Hourly readings or more frequently
- Professionally conducted
- Fastest
- Device must be calibrated annually
- 48 hour minimum
- Tamper detection features
- Use average result



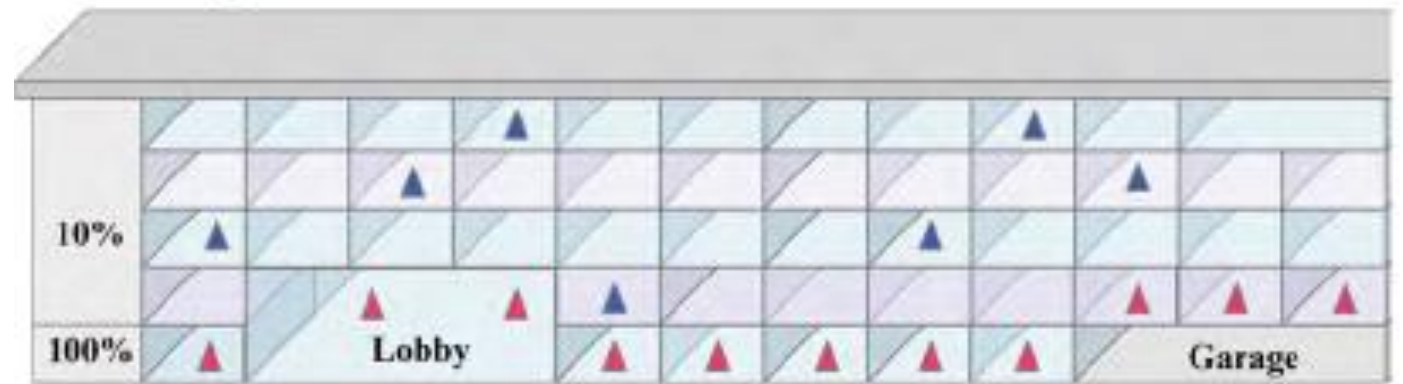
Single Family: Rooms to test

- General
 - test lowest “lived-in” (~10 hrs per week)
- Real estate transactions
 - test lowest “livable” area(s), usually basement (finished or not)
- Licensed professionals must test for each foundation

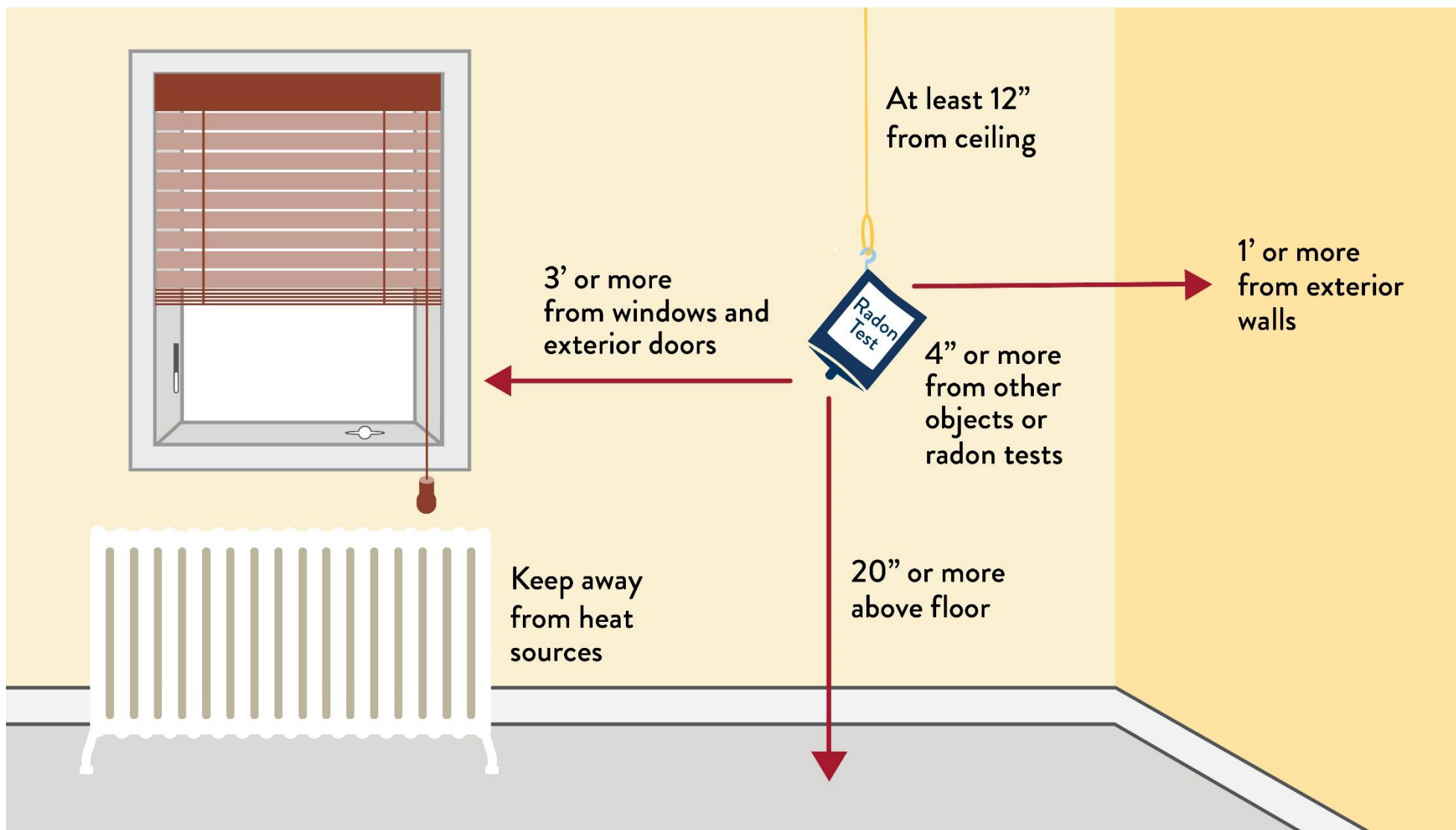


Multi-Family: Where to test

- Test all ground contact units
 - Floor/walls contact ground
 - Above crawl space, utility tunnel, parking, other non-habitable space
- Test 10% on upper floors
- A sample of rooms will likely miss a problem room



Location in room

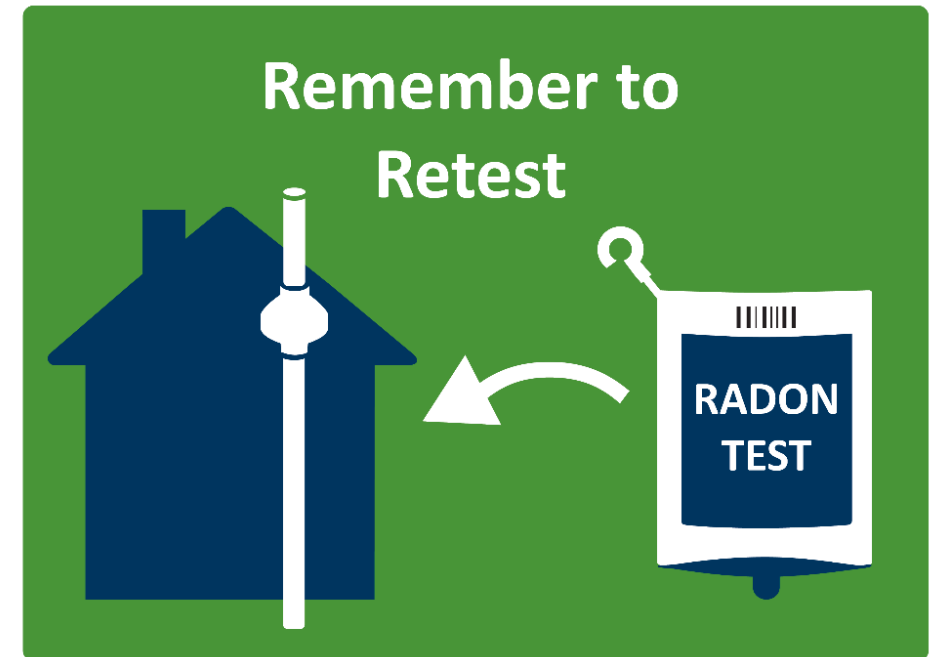


Testing Procedures (short tests)

- Exterior doors and windows closed (except normal entry/exit)
- House closed 12 hours prior to the start of the test
- Temperature set to 65-80 F
- HRV/ERV set to lowest ventilation condition
- Whole house fans not operated
- Fireplaces not operated (unless they are the primary and normal heating sources)
- No excessive use of clothes dryers, kitchen exhaust fans, and bathroom fans.
- No tampering, removal or change in the location of the test device(s).

How often should I test? General Public Advice

- Now, if you've never tested
- Every 5 years, if prior results under 4.0 pCi/L
- Every 2 years, if mitigation installed
- After:
 - Changes to heating / cooling
 - New addition to home
 - Start occupy areas not tested before (eg basement)
 - New holes in foundation
 - Changes to mitigation system





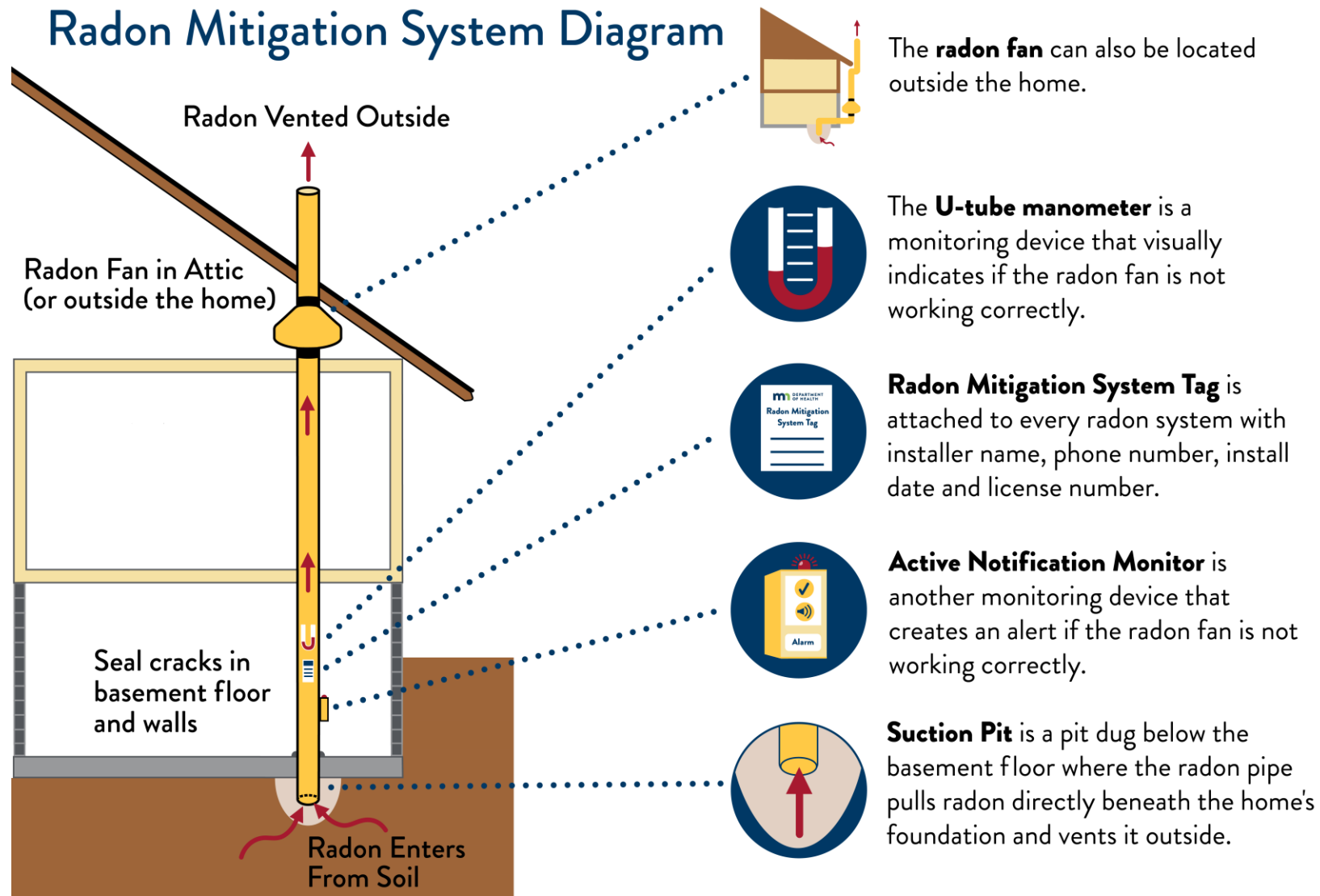
Mitigation

What if you find elevated radon level?

- Contact a radon mitigation professional
- MDH maintains a list of licensed professionals
- Follow recommended questions to identify professional



Mitigation Basics



Radon Mitigation Process






10 STEP GUIDE

to the radon mitigation process



Before mitigation • During mitigation

After mitigation



Before mitigation

-  Radon test reveals the home has a radon problem.
-  Contact licensed radon mitigation professionals to request bids.
-  Professional does a walk-through of the home to identify the mitigation system to install.
-  Review key questions with professional, and request a proposal.
-  Review bids and select a professional.

During mitigation

-  Professional may perform diagnostic testing to ensure proper fan size and correct installation.
-  Professional seals cracks and openings in the basement.
-  Professional installs the radon mitigation system.

After mitigation

-  Professional provides a full explanation of how the system operates to the homeowner.
-  Retest the home to ensure the system has reduced radon levels.

Can't We Just Seal The Cracks?



- Too many
- Many inaccessible
- New cracks open
- Other pathways (open soil, block wall)

Doesn't My Air Exchanger Take Care of the Problem?

May help somewhat...IF

- Clean intake
- Filters clean/changed
- Balanced airflow



Safety: Check for back-drafting



Recommend Pressure Testing “Suck” Under Entire Home



Radon Mitigation System

Re-directs soil gasses

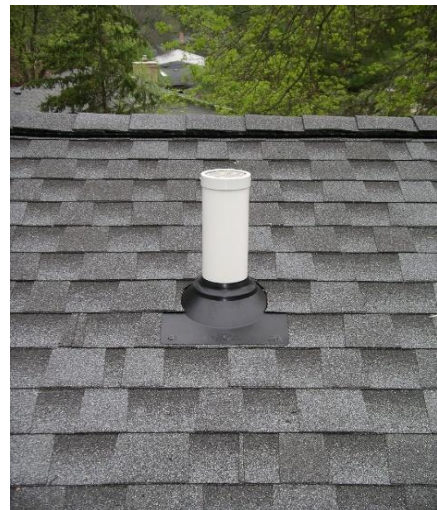
Piping starts under home

Fan

Discharge away

MDH can inspect after
6/1/20)

10/18/2022



Other Parts of System

Active Notification Monitor



Pressure Measurement Device

FAN IS WORKING
Indicates air is moving

FAN IS NOT WORKING
Indicates air is not moving



Labels

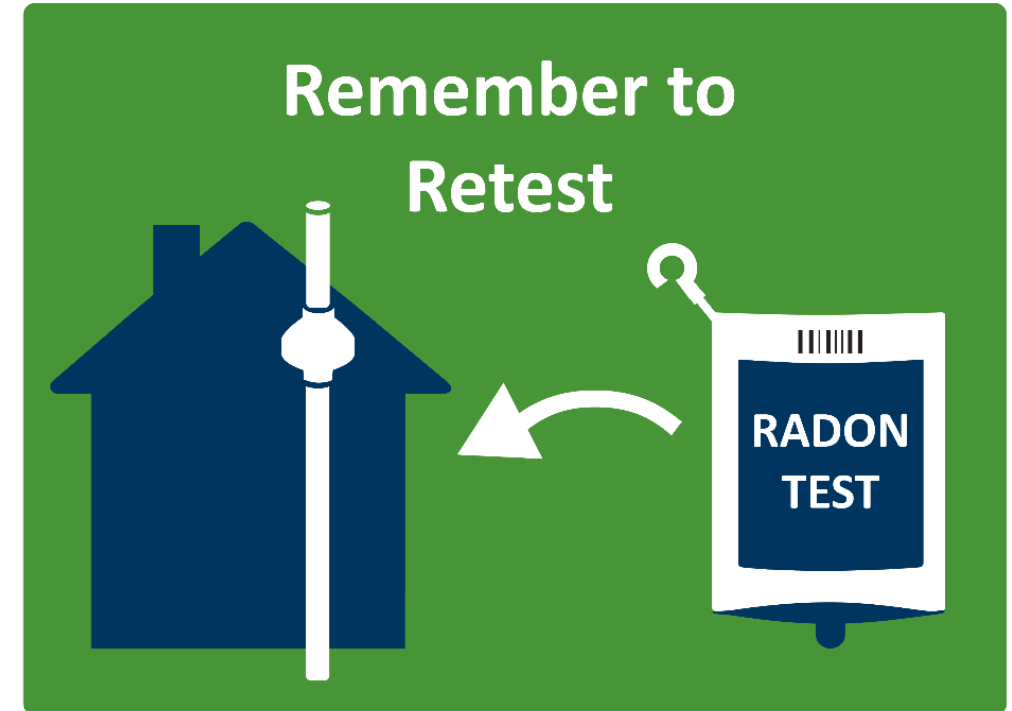


Operation, Monitoring & Maintenance Plan



Follow-up Procedures

- Test home after mitigation
 - 24 hours to 30 days after installation
- Retest
 - every 2 years
 - new additions, HVAC changes, new openings to soil, mitigation altered/repaired
- Homeowners can request a mitigation inspection by contacting MDH (after 6/1/20)

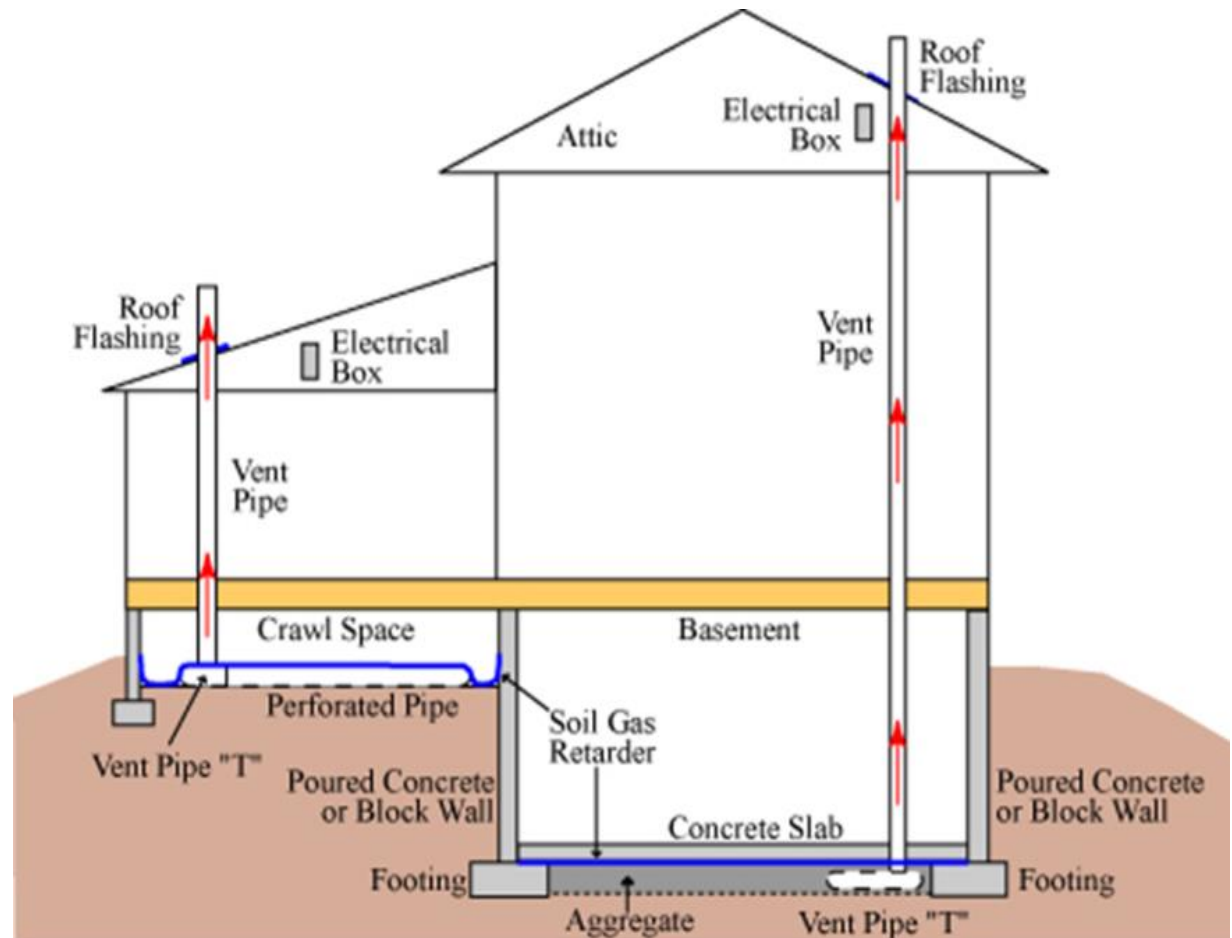




Laws & Policies

New Homes Must be Built “Radon Resistant”

- Passive in code since 2009
- Passive (required)
 - No fan
 - ~40% reduction
 - 35,663 housing units built (10/1/20-9/30/21)
- Active (recommended)
 - Radon fan
 - 90+% reduction



Aggregate Under the Slab



Vent Pipe and Soil Gas Retarder



What's Next?

- 1) Add fan during construction, or
- 2) Test for radon after occupancy (if elevated, activate the system)



Radon in Home Sales

- No testing or mitigation required
 - Some lenders and relocation companies have policies that require it
- Testing and mitigation can be done (eg, during home inspection)
 - Use licensed pros



Home Sales: Awareness Leads to More Testing and Mitigation

Effective January 1, 2014

- Seller required to disclose radon information
 - Any radon tests done on property
 - Describe radon testing results & provide reports
 - Provide info on radon systems installed
- Provide a radon warning statement
- Provide “Radon in Real Estate Transaction” document



Radon Warning Statement & 2-page Publication

“The Minnesota Department of Health strongly recommends that ALL homebuyers have an indoor radon test performed prior to purchase or taking occupancy, and recommends having the radon levels mitigated if elevated radon concentrations are found. Elevated radon concentrations can easily be reduced by a qualified, certified, or licensed, if applicable, radon mitigator.

Every buyer of any interest in residential real property is notified that the property may present exposure to dangerous levels of indoor radon gas that may place the occupants at risk of developing radon-induced lung cancer. Radon, a Class A human carcinogen, is the leading cause of lung cancer in nonsmokers and the second leading cause overall. The seller of any interest in residential real property is required to provide the buyer with any information on radon test results of the dwelling.”



Radon in Real Estate Transactions

All Minnesota homes can have dangerous levels of radon gas. Radon is a colorless, odorless and tasteless radioactive gas that can seep into homes from the soil. When inhaled, its radioactive particles can damage the lungs. Long-term exposure to radon can lead to lung cancer. About 21,000 lung cancer deaths each year in the United States are caused by radon.

The only way to know how much radon gas has entered the home is to conduct a radon test. MDH estimates 2 in 5 homes exceed the 4.0 pCi/L (picocuries per liter) action level. Whether a home is old or new, any home can have high levels of radon.

The purpose of this publication is to educate and inform potential home buyers of the risks of radon exposure, and how to test for and reduce radon as part of real estate transactions.

Disclosure Requirements

Effective January 1, 2014, the Minnesota Radon Awareness Act requires specific disclosure and education be provided to potential home buyers during residential real estate transactions in Minnesota. Before signing a purchase agreement to sell or transfer residential real property, the seller shall provide this publication and shall disclose in writing to the buyer:

1. whether a radon test or tests have occurred on the property
2. the most current records and reports pertaining to radon concentrations within the dwelling
3. a description of any radon levels, mitigation, or remediation
4. information on the radon mitigation system, if a system was installed
5. a radon warning statement

Radon Facts

How dangerous is radon? Radon is the number one cause of lung cancer in non-smokers, and the second leading cause overall. Your risk for lung cancer increases with higher levels of radon, prolonged exposure, and whether or not you are a current smoker or former smoker.

Where is your greatest exposure to radon? For most Minnesotans, your greatest exposure is at home where radon can concentrate indoors.

What is the recommended action based on my results? If the average radon in the home is at or above 4.0 pCi/L, the home's radon level should be reduced. Also, consider mitigating if radon levels are between 2.0 pCi/L and 3.9 pCi/L. Any amount of radon, even below the recommended action level, carries some risk.

Radon Warning Statement

“The Minnesota Department of Health strongly recommends that ALL homebuyers have an indoor radon test performed prior to purchase or taking occupancy, and recommends having the radon levels mitigated if elevated radon concentrations are found. Elevated radon concentrations can easily be reduced by a qualified, certified, or licensed, if applicable, radon mitigator.


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Licensure for Service Providers

- License required:
 - If you don't own or lease the property
 - Professionals that measure for radon (home inspectors, consultants, etc.)
 - Professionals that mitigate radon (plumbers, HVAC contractors, etc.)

MN Radon Licensing

- Is contractor licensed to test for radon?
 - check MDH site
 - ask for proof of current MDH license
 - not same as certification
- Radon pros can do both mitigation and measurement (if licensed for both)
- Homeowners can request a mitigation inspection by contacting MDH (after 6/1/20)

 **DEPARTMENT OF HEALTH**

Radon Licensing and Tag System

Home Reports Help

Radon Service Providers

***Licensed radon mitigation professionals are required to attach a MDH system tag upon completion of radon systems installed on September 1, 2020 and later. Building owners/occupants may request a free inspection of the radon system by contacting the MDH Indoor Air Unit at 651-201-4601 or by emailing health.indoorair@state.mn.us.**

Provider Type: *
Measurement

Service Type:
☒ Single Family Homes
☐ Multi Family Buildings
☐ Schools and Large Buildings

Your Zip Code to Limit Search:
55124
Leave blank for Statewide result.

Search

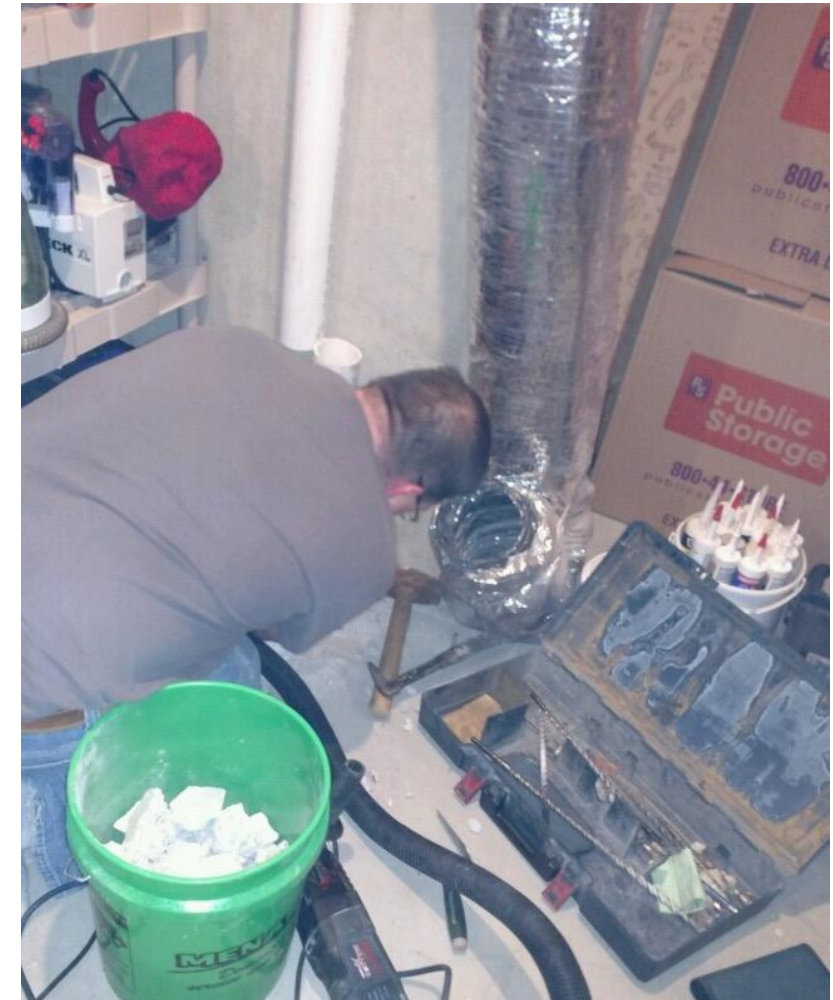
Professional	Company Name	Address	Services Provided	Service Area
Chao-HsiangDavid Cheng - RMEA-00208 (612) 224-6659	Trusted Home Inspection, LLC	15221 Florist Cir Apple Valley, MN 55124	Single Family Measurement	100 miles
Karl Sanders - RMEA-00023 (612) 408-4000	Homtech, Inc. www.inspectwithkarl.com	6921 137th Ct W Apple Valley, MN 55124	Single Family Measurement	100 miles
Gina Carlson - RMIT-00032 (952) 220-9409	Healthy Homes healthyhomesradon.com	15050 Cedar Ave S Apple Valley, MN 55124	Single Family Mitigation Multi Family Mitigation Schools & Large Buildings Mitigation Single Family Measurement	Statewide
Yury Slutsky - RMEA-00222 (612) 816-2363	MSP Inspections LLC http://mspinspections.com/	4204 Sumac Pt Eagan, MN 55122	Single Family Measurement	50 miles
Jason Gale - RMEA-00244 (651) 452-4663	All-In-One Home Inspecting LLC www.allinonehomeinspecting.com	1547B Clemson Dr Eagan, MN 55122	Single Family Measurement	50 miles

How to get licensed

- Measurement
 - 16 hour training
 - Pass exam
 - Quality assurance plan
 - Apply online (\$150 per year)
 - Renew with 8 hrs CE per year
- Mitigation (includes measurement license)
 - 16 hr measurement + 24 hr mitigation training
 - Pass 2 exams
 - QA plan
 - Apply online (\$250 per year)
 - Company license likely (\$0 or \$100)
 - Renew with 12 hrs CE per year

Licensee requirements

- Use approved devices and labs
- Follow quality assurance plan for measurement
- Follow AARST-ANSI standards
- Report data quarterly to MDH
- Notify MDH of any changes to license
- Maintain records for at least 3 years
- Make available information to MDH (for audits and inspections)
- Affix MDH Radon Mitigation System Tag



Other Laws

- Public Schools:
 - Testing not required
 - If choose to test, must follow state's testing plan, report data to MDH and board
- MDH data
 - Considered non-public, can't be shared generally

Other Laws

- New construction and major renovations of state buildings
 - If funded from bond proceeds must follow the state's building design guidelines, which currently include radon control requirements.
- Child Care, Rental Housing:
 - No requirements to test, mitigate or disclose

MN Housing Policy

mnhousing.gov/sites/multifamily/radonmitigation

- All multifamily project receiving funding from MN Housing must:
 - Test using certified and MDH licensed individual
 - Follow AARST testing and mitigation standard for multifamily housing (including resident notifications)
 - Submit radon report at project phases
 - No exterior radon systems allowed
 - Test regardless of refi includes rehab
 - Test regardless of underground garage
 - At or above 4 pCi/L → mitigate
 - If refi with rehab, can mitigate prior to closing or in rehab process

MN Housing Policy

- New construction
 - No Underground garage → build passive (building code)
 - Test all ground contact plus at least 10% of unit on upper floor.
 - If elevated, activate passive system or install system

MN Housing Policy

- Substantial Rehab
 - Install passive sub-slab system (building code)
 - Test all ground contact plus at least 10% of unit on upper floor.
 - If elevated, activate system

MN Housing Policy

- Moderate rehab
 - Test preconstruction (if won't influence radon) or post construction (if will influence)
 - Some exception may apply, contact MN Housing
 - If elevated, install active radon system

Federal Lending Policies

- HUD multifamily loans
 - 2020 Multifamily Accelerated Processing Guide (chapter 9.6.3)
 - Testing with licensed pro, follow standard
 - https://www.hud.gov/program_offices/administration/hudclips/guidebooks/hsg-GB4430
- FHFA
 - Fannie Mae and Freddie Mac multifamily loans
 - Being reviewed currently--considering testing per standards and licensed individuals

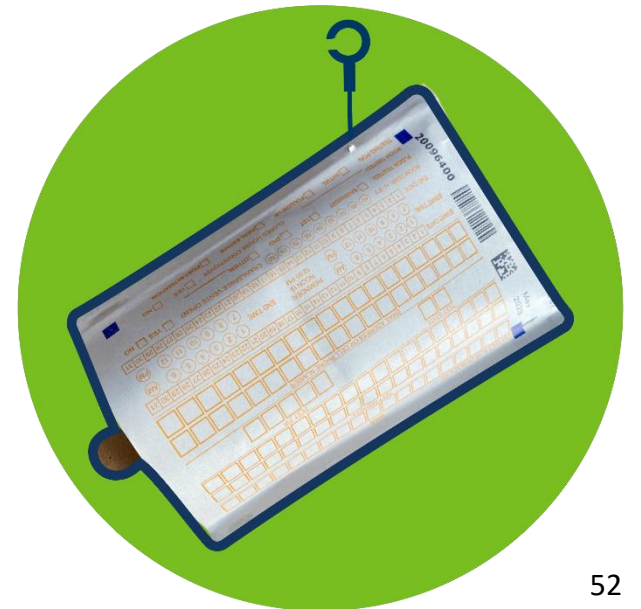
MDH Awareness Efforts

- 500-600 Spots, 20 million gross impressions
 - TV (15 Sec): 4 major channels
 - Radio (15 Sec): pop, talk, public radio
- On-line banners: Twincities.com
- 10 – 15 Digital Billboards
- Press release (January)
- Community events, trainings



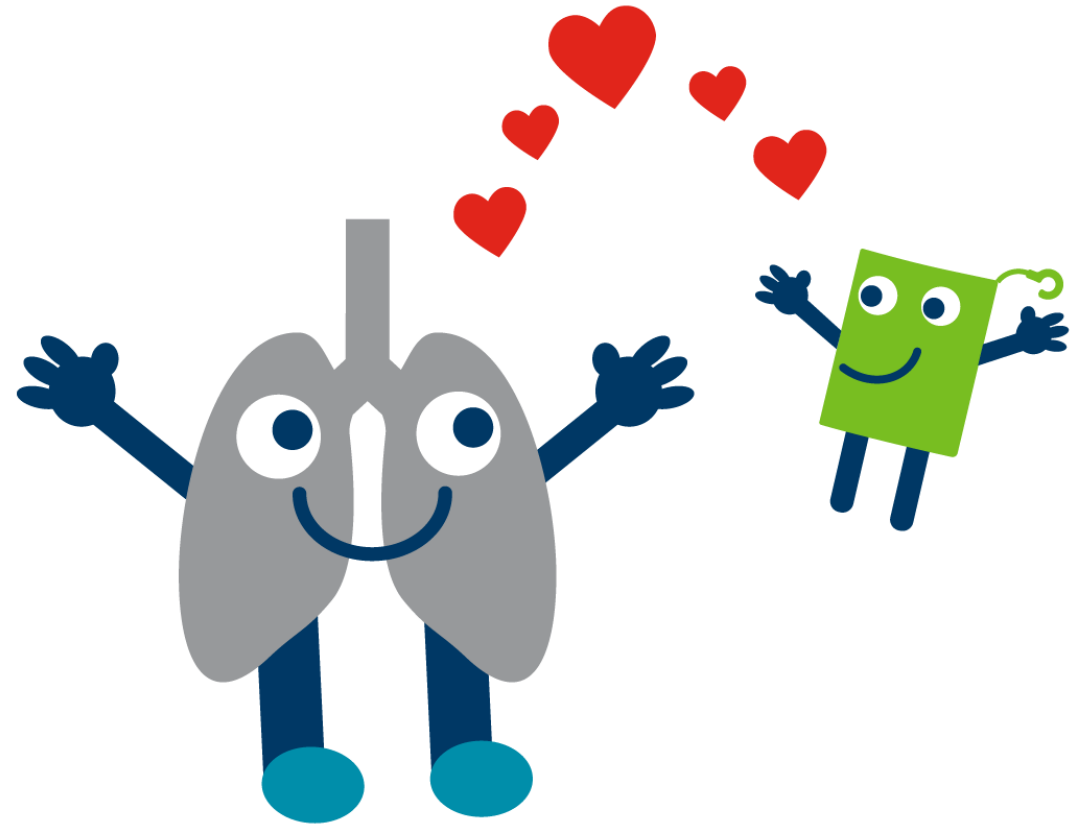
MDH Outreach with Partners

- 66 - 110 partners per year
- Distribute 4,000 – 10,000 test kits and brochures
 - Also: example articles, social media, press release, joint presentations, media interview, training
- State master contract (Air Chek): \$5.35 per kit
- How can we partner with you?



Create a Healthier Home: Test...Fix...Prevent Lung Cancer

- Minnesota has high radon levels (2 in 5 homes elevated)
- EPA action level is 4.0 pCi/L
- Testing/mitigation can be done
- Use licensed professionals (if you don't own or lease or under other policy)
- Know and follow policies and laws



For More Information

MDH Indoor Air Unit

651-201-4601

health.indoorair@state.mn.us

mn.gov/radon

U.S. Environmental Protection Agency

epa.gov/radon

Questions? Ask through chat or 'raise hand' to be unmuted