



EVERYTHING YOU NEED TO KNOW ABOUT:
RADON

In The next 45 Minutes:

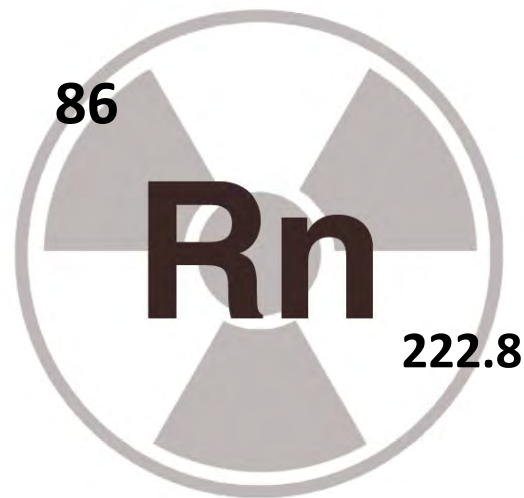


- You will learn all you need to know about Radon
- You will learn why Radon is an important topic *now*
- 3 People in the U.S will die from Radon
- You will find out how to avoid becoming one of them

What is Radon?

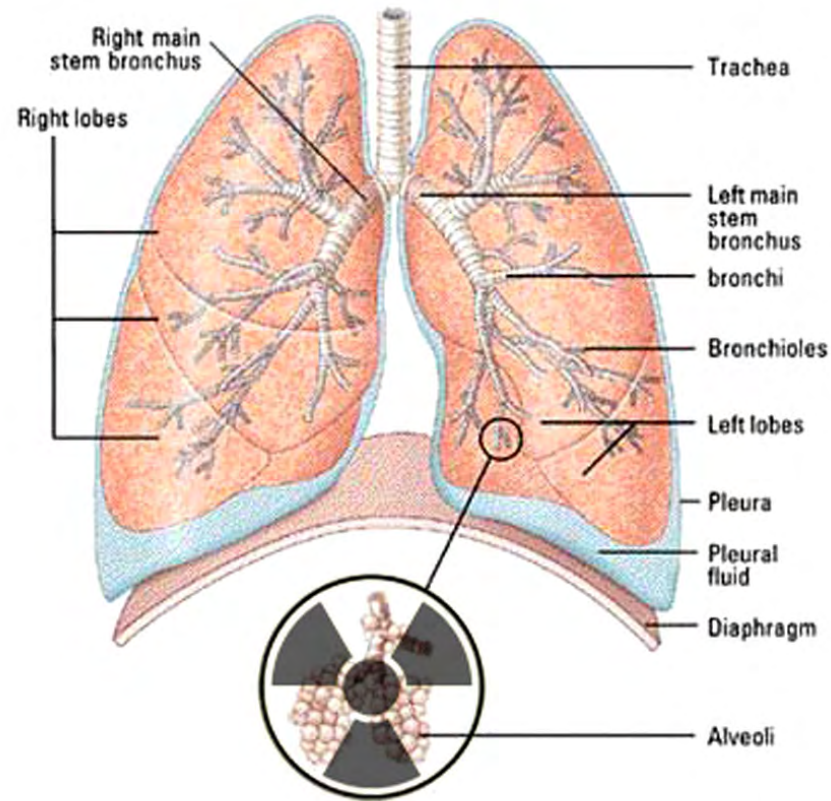


What is Radon?



- A naturally occurring, radioactive gas
- Colorless, odorless, tasteless

What is Radon?



- The second leading cause of lung cancer

What is Radon?

Causes of Lung Cancer:



#1: Cigarettes

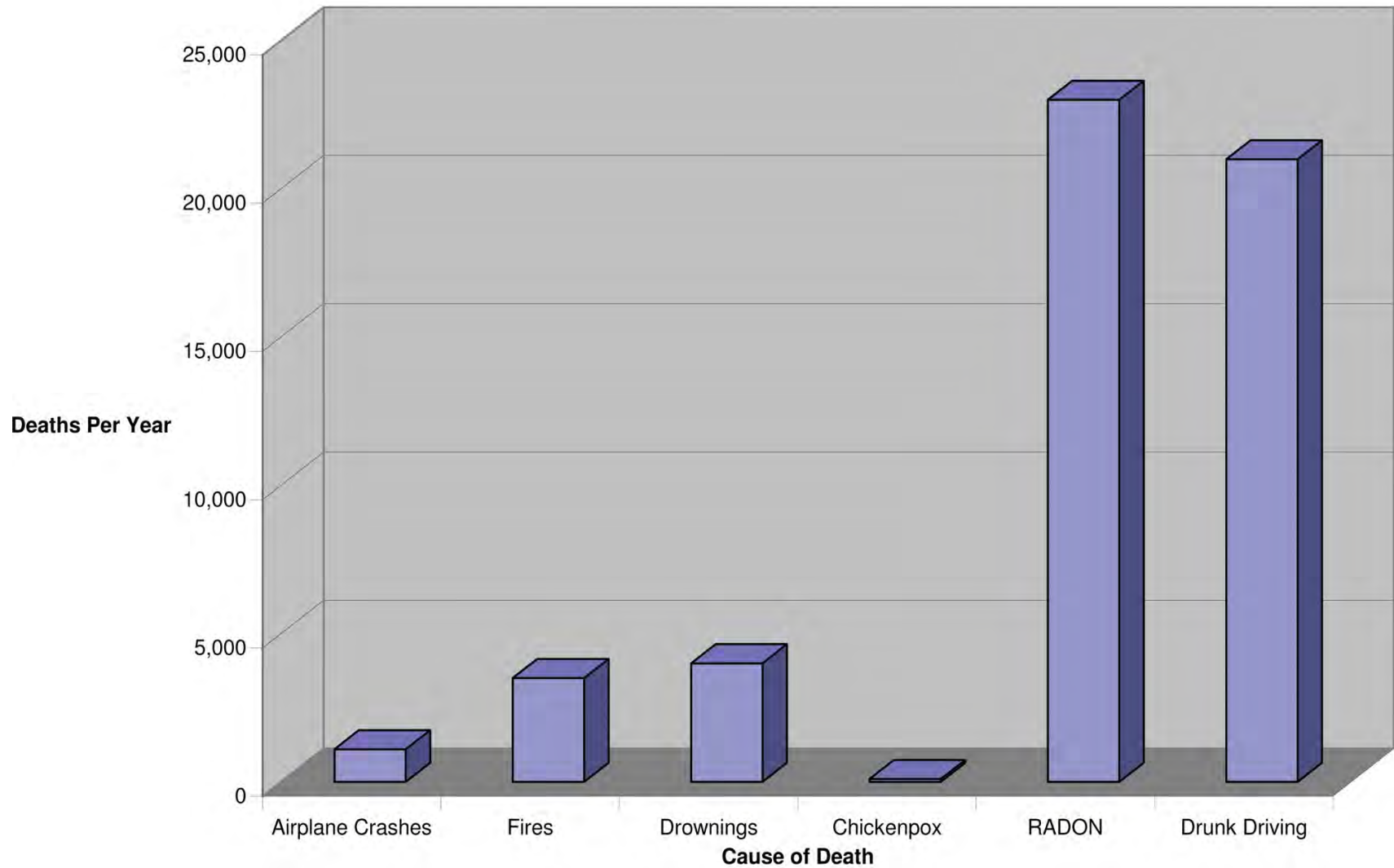


#2: Radon

Lung Cancer Risk

- The health risk from radon is 15 times greater for smokers than non-smokers
- Children and Elderly at greater risk

Annual Deaths from Selected Causes



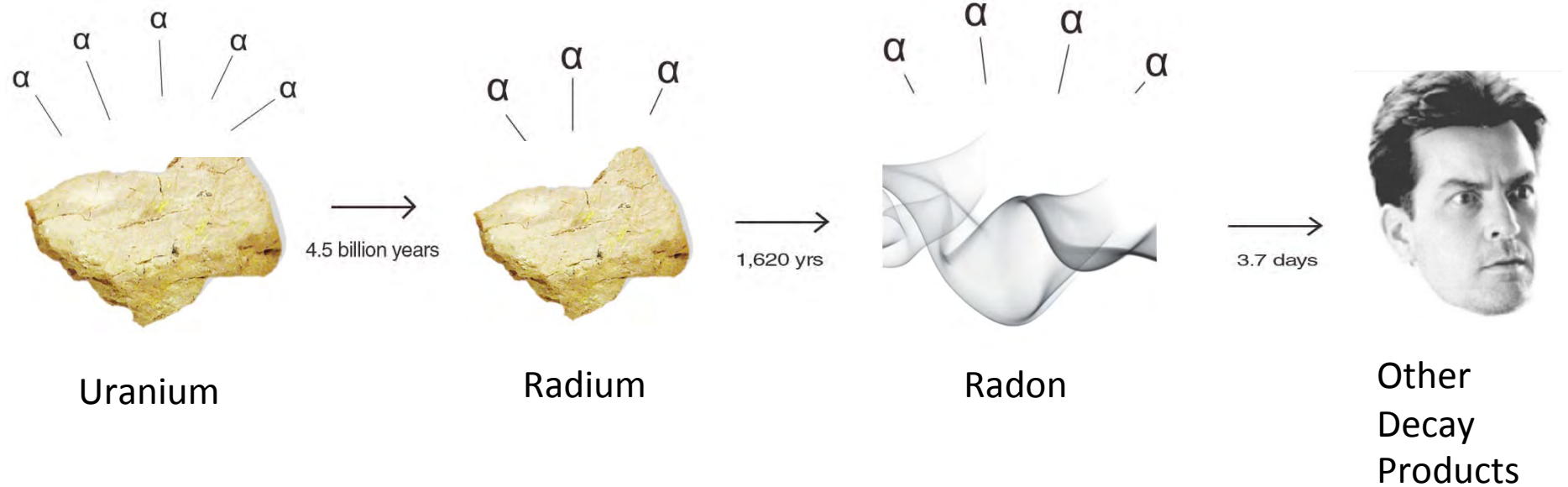
Is Radon Really a Problem?

- Radon kills an estimated 23,000 people every year

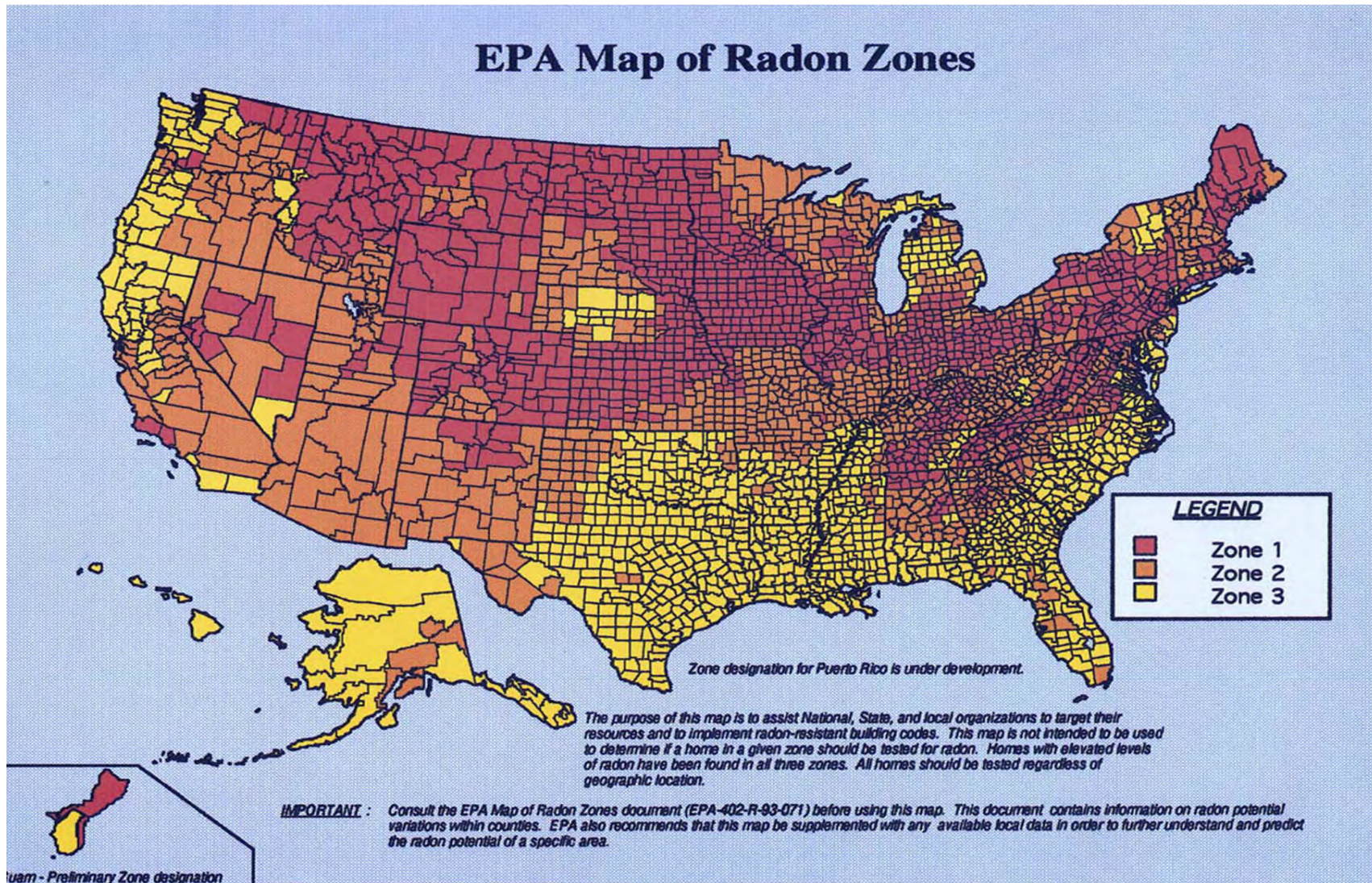


- Radon is a Serial Killer

Where does Radon come from?



Where is Radon Found?

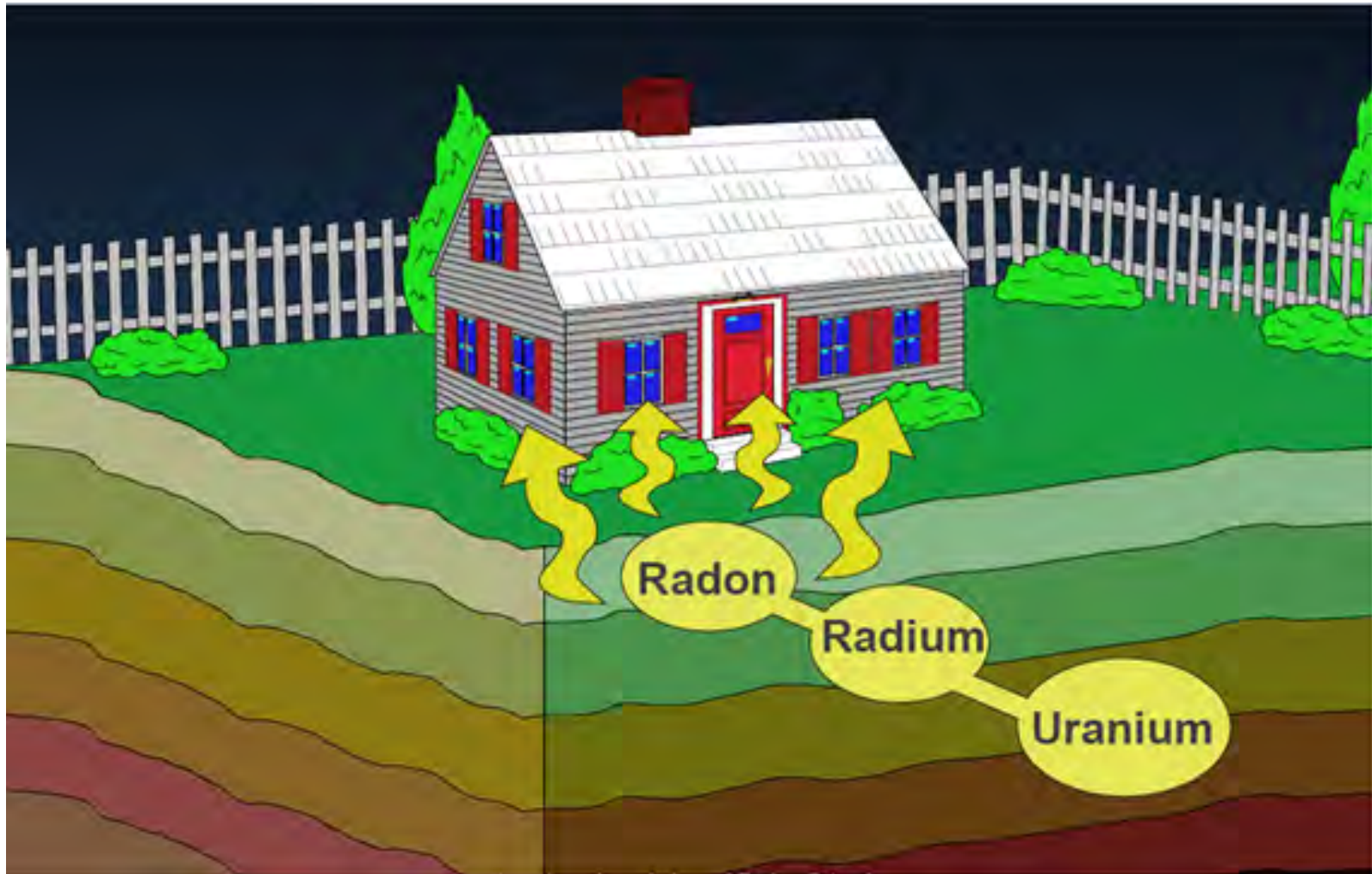


Where is Radon Found?



1 in 3 Minnesota homes contain elevated levels of Radon?

How Does Radon Get in my House?

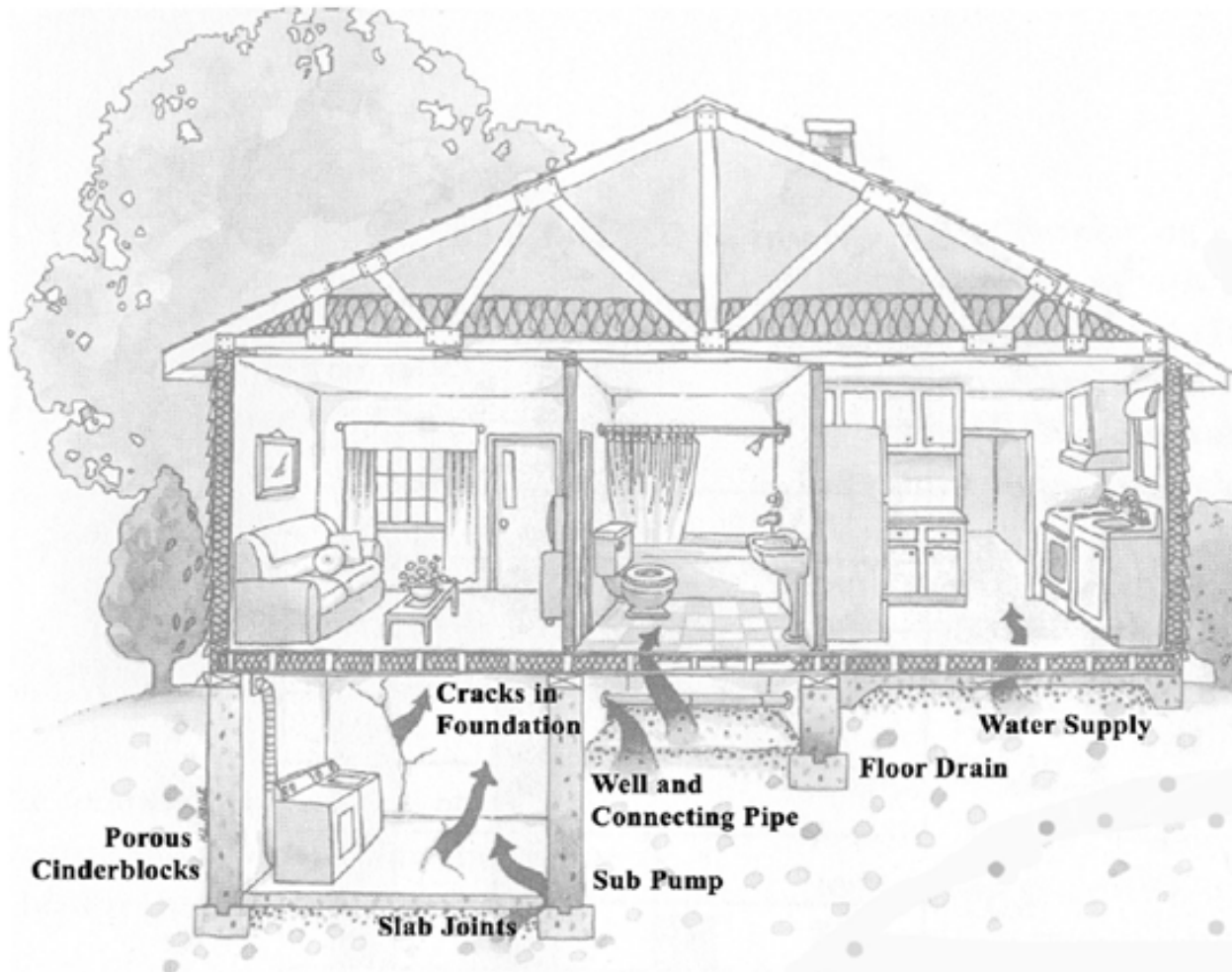


How Does Radon Get in my House?



Your house sucks

How Does Radon Get in my House?



How Does Radon Get in my House?

- Strength of the source: how much uranium is in your soil
- Porosity of the soil
- House construction and foundation type:
- Weather: wind, temperature, barometric pressure
- Occupant behavior

Why is Radon an Important Issue *Now*?

- We know more about radon from years of research and data
- We live differently in our house

Why is Radon an Important Issue *Now*?



Old House

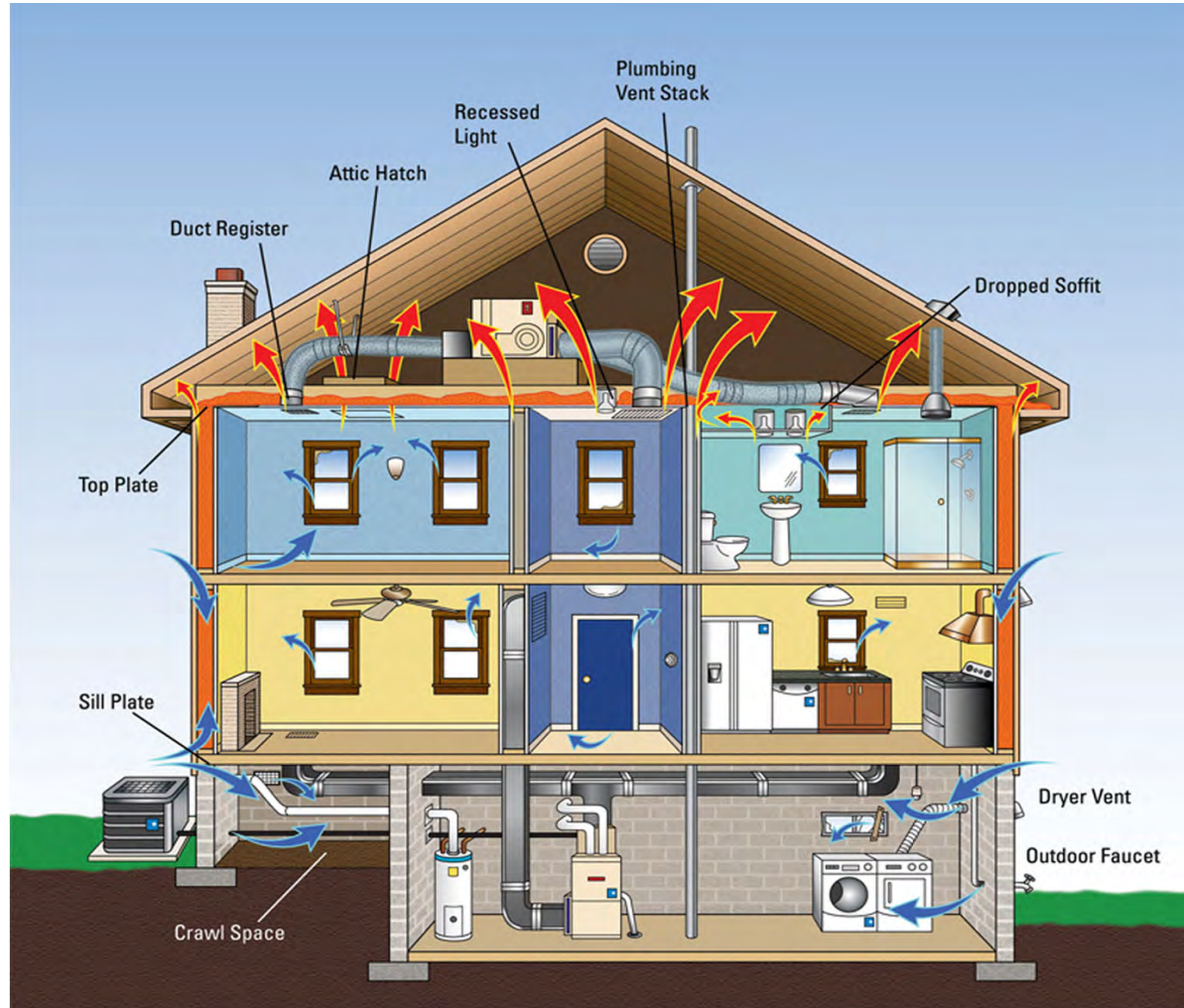
- Leakier
- More Ventilation (unintentional)
- Unfinished Basements



New House

- Tighter
- Less Ventilation
- Basements Living Space

Houses are changing



Unintended Consequences

How do I know if I have Radon?



Testing is the only way to know if you are at risk

What is the appropriate testing Method?

- Most accurate test is a year long average
- Long term testing – Longer than 90 Days
 - Alpha Track Monitors
 - Electret Chambers
- Can be purchased online for \$30-\$60

What is the appropriate testing Method?

Two Common Long term Methods: More than 90 day



Alpha Track Monitor



Electret Chamber

What is the appropriate testing Method?

Short Term Testing

- Most common
 - Activated Charcoal Test
 - Continuous Radon Monitor (CRM)

What is the appropriate testing Method?

Two Most Common Methods:



Activated Charcoal Canister



Continuous Radon Monitor

How Do I Test for Radon My Home?



Activated Charcoal Canister

Pros and Cons

- Inexpensive \$10-\$20
- Accessible
- 3-7 day long testing
- 3-5 wait for lab report
- Not as accurate
- Doesn't give details

How Do I Test for Radon My Home?



Continuous Radon Monitor

Pros and Cons

- Immediate Results
- 48 testing time
- Very Accurate
- Gives Hourly Radon Levels
- More expensive \$150-\$175

Testing QA

- Controlled Chain of Custody
- Calibrations
- Blanks
- Spikes
- Parallel Tests

DIY Testing

- Activated Charcoal Kits – MDH
- Alpha Track - MDH
- Box Store Kits
- Electronic Radon Monitors



Radon Testing for Real-estate Transactions

- MN Radon Awareness Act (MRAA) passed in 2013
- In effect starting January 1, 2014
- Mandatory disclosure of Radon Testing and Mitigation

Radon Testing for Real-estate Transactions

- Whether a radon test or tests have occurred on the property;
- The most current records and reports pertaining to radon concentrations within the dwelling;
- A description of any radon concentrations, mitigation, or remediation;
- Information regarding the radon mitigation system, including system description and documentation, if such system has been installed in the dwelling; and
- A radon warning statement
- A copy of the Minnesota Department of Health publication entitled "Radon in Real Estate Transactions."

Radon Testing for Real-estate Transactions

- Single CRM Test (fastest)
- Duplicate ACC testing (Next fastest)
- Short Term Sequential Testing (Longest)

Who Should Perform My Radon Test?



Only use certified Radon Measurement Professionals

What Do My Test Results Mean?

- Measured in picocuries per liter (pCi/L)
- EPA Action Level: 4 pCi/L
- WHO Action Level: 2.7 pCi/L

What Do My Test Results Mean?

- There are no safe levels of radon
- Background levels are .4-.8 pCi/L
- EPA and WHO working to lower the Action Level to 2 pCi/L

How Do I Get Rid of Radon

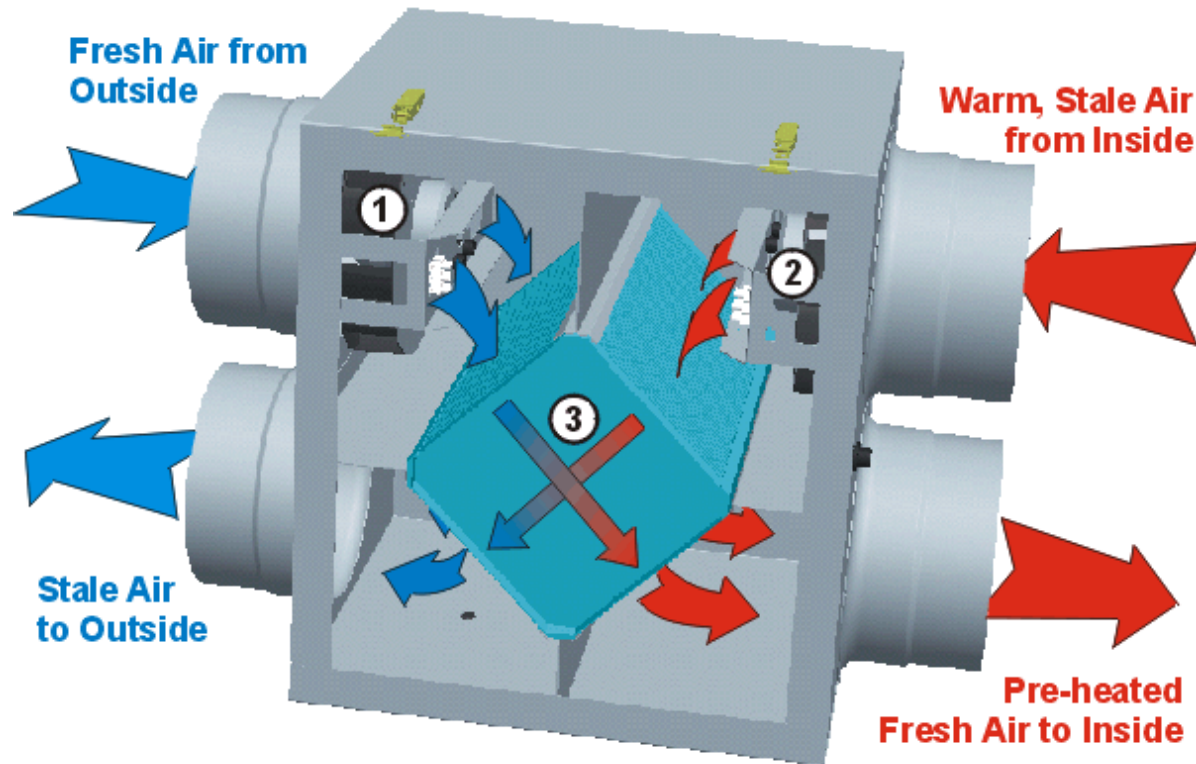
It is not economical to remove the
source of radon

How Do I Get Rid of Radon



Hard to stop your house from sucking!

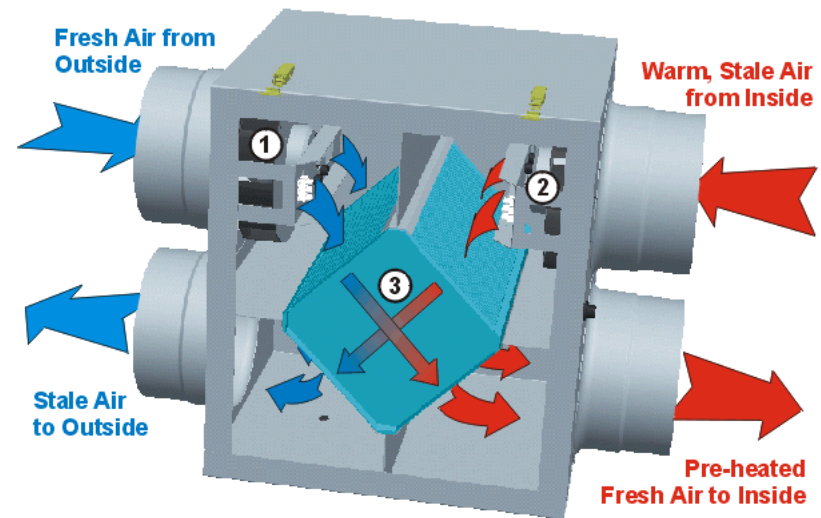
How Do I Get Rid of Radon



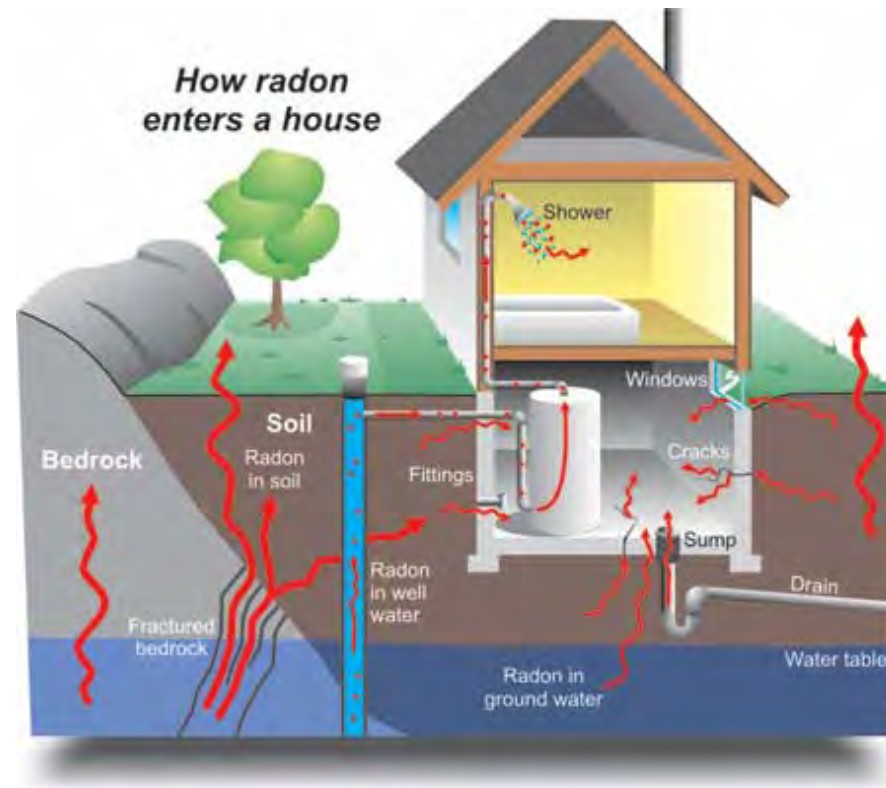
Add ventilation to dilute the radon levels

How Do I Get Rid of Radon

- This is the least used method
- Requires Blower Door testing for system design
- Does not handle higher Radon levels
- Major energy penalties



How Do I Get Rid of Radon



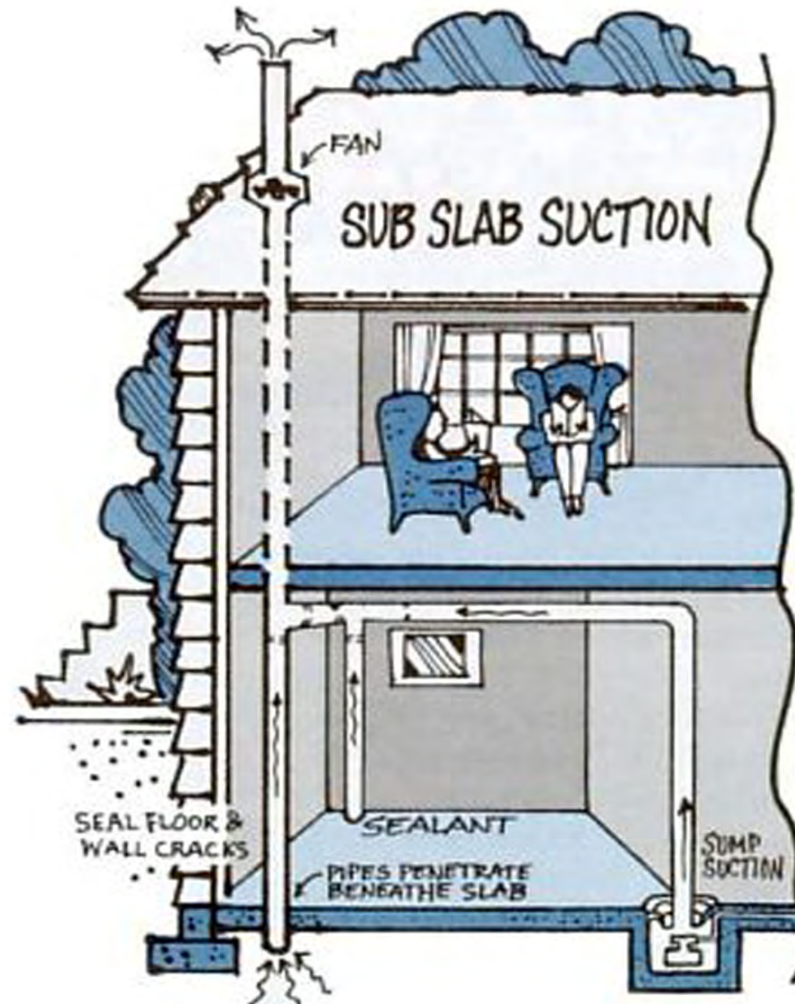
Minimize Entry Point – Caulking, filling gaps and cracks

How Do I Get Rid of Radon



- Covering open dirt
- Sealing Crawlspace

How Do I Get Rid of Radon



Provide a controlled path for radon to get out of your home

What Solution is Right for my Home?



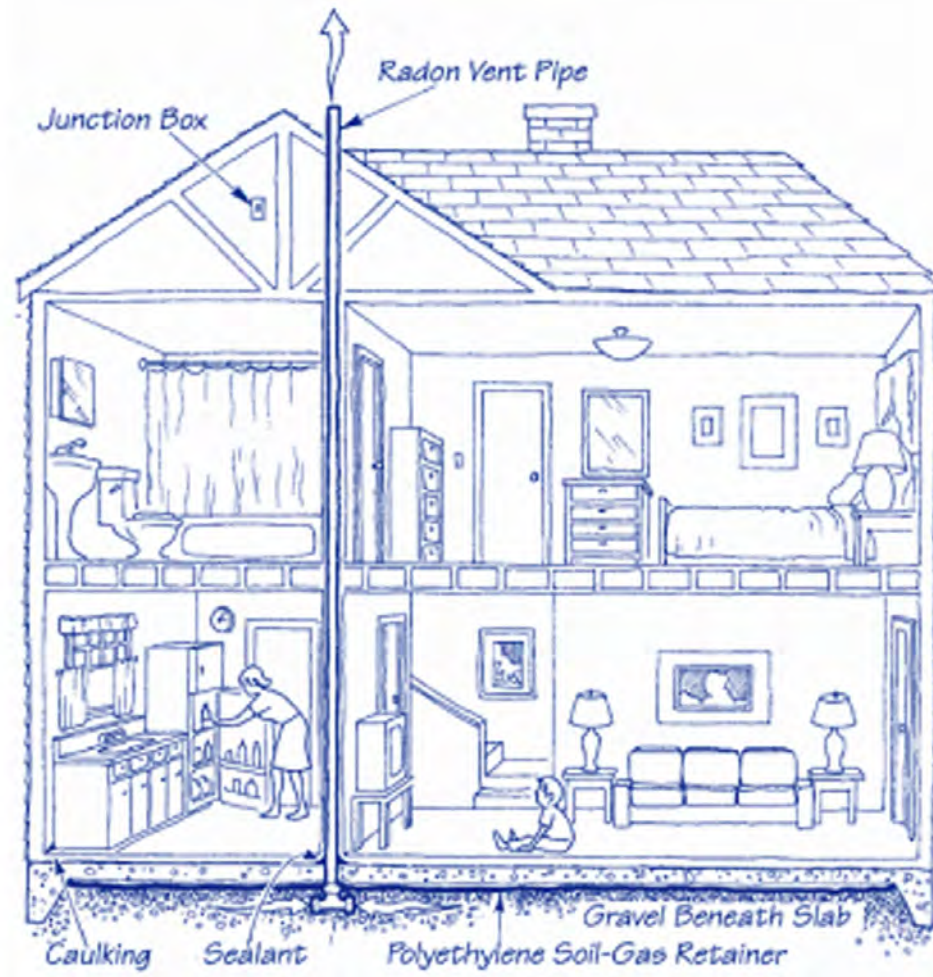
Building diagnostics tell us what mitigation system is best for your house.

This is critical to insure the success of any Mitigation System

What Solution is Right for my Home?

Most common and effective method:
Sub Slab Venting Systems

What Solution is Right for my Home?



Sub-Slab Passive Radon Vent

What Solution is Right for my Home?

Sub Slab Venting Systems

- Sub-Slab Passive Radon Vent
 - Current Building Code requires Passive vents to be installed in new construction
 - Difficult to implement in Retrofits
 - Venting is driven by stack effect in the pipe
 - Pipe needs a straight, vertical path
 - Sub-slab conditions need to cooperate

What Solution is Right for my Home?

Sub Slab Venting Systems

- Active Sub-Slab Radon Vent
 - Most common System installed in Retrofit
 - Very Effective
 - Affordable

What Solution is Right for my Home?

Sub Slab Venting Systems



What Solution is Right for my Home?

Sub Slab Venting Systems



Post Mitigation

- Post testing should occur after 24 hours
- Worst case depressurization testing should be performed to
 - Determine if venting system can overcome WCD
 - Combustion safety
- Re-test home every 2 years
- Retest after any changes to building envelope or mechanical systems
- Sub Slab Environment can dehydrate, changing venting system performance
- Exterior venting systems can freeze up in extreme cold

How Much Does Mitigation Cost?

Exterior Systems

- Typical Exterior Systems Cost: \$1500-\$2000
- Depends on aesthetics of system, ease of routing pipe
- Cheaper systems often don't include
 - Pressure Field Extension (PFE) testing
 - Electrical work, or unlicensed work is performed
 - Post testing (Radon level and WCD)

How Much Does Mitigation Cost?

Interior Systems

- Can be very expensive
- Best if remodeling is happening

Who Should Install a Radon Mitigation System?

A Radon Mitigation Professional will also:

- Be licensed contractor
- Pull the appropriate permits and get inspections
- Use a licensed electrician with appropriate permits and inspections
- Will perform pre-diagnostics
- Will Perform Combustion Safety Testing
- Will test for post radon levels
- Will guarantee results
- Will warranty the system

Who Should Install a Radon Mitigation System?



Only use certified Radon Mitigation Professionals



GET RID OF YOUR RADIOACTIVE GAS

Questions

