

Radon in Maine

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Environmental and Occupational Health Program



*Department of Health
and Human Services*

*Maine People Living
Safe, Healthy and Productive Lives*

John E. Baldacci, Governor

Brenda M. Harvey, Commissioner

Problem

Radon causes lung cancer

There is a lot of radon in Maine

People aren't doing anything about it

How do we know Radon causes Cancer?

Three Major Lines of Evidence

- Studies of atomic bomb survivors
- Studies of uranium mine workers
 - Studies of residential homes

The Iowa Radon Lung Cancer Study

- Case-Control Study: 413 cases, 614 controls**
- Restricted to women who lived in current home for at least 20 years**
- Long-term radon measurements in homes, workplace, and outdoor air**
- The risk estimates are in general agreement with NRC risk estimates**

Pooling of Case-Control Studies

Pooled Case-Control Studies	Cases (number)	Controls (number)	Excess Odds at 2.7 pCi/L
7 North American Studies	3662	4966	0.11 (0.00-0.28)
13 European Studies	7148	14208	0.08 (0.03-0.16)
2 Chinese Studies	1050	1996	0.13 (0.01-0.36)
Minor Data			0.12 (0.02-0.25)

What do we do with this new information?

- Major new focus of EOHP and collaboration with Radon Program
 - Lower well water guidance from 20,000 pCi/L to 4,000 pCi/L
 - Emphasize air treatment at 2 pCi/L.

“I thought radon was an air pollution problem.”

Bob responds: Radon is a problem in both water and air in many houses in Maine. To learn if you have a radon problem you need to test both the air in your home and your well water. Radon in the air should be below 2 pCi/L. Call us for a list of labs certified to do both air and water radon tests. Tollfree in Maine:



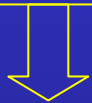
Bob from Maine
Radiation Control
Program

1-800-232-0842

What do these numbers really mean?

PERC

5 in a million



Radon in Well Water

3 in a thousand



less

cancer risk

more

MTBE

3 in a million



Chlordane

70 in a million



Radon in Air

2 pCi/L

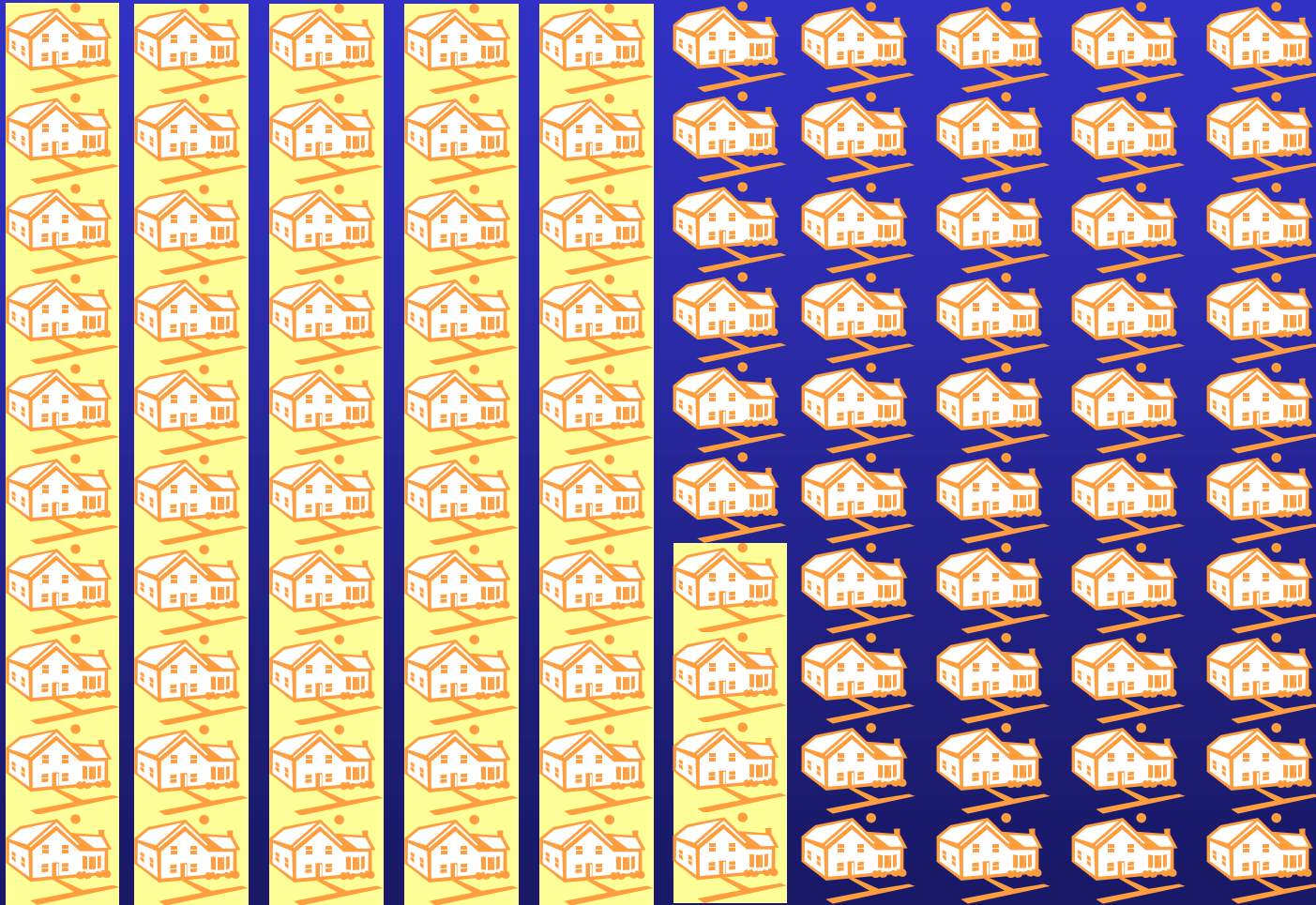
1 in a hundred

to

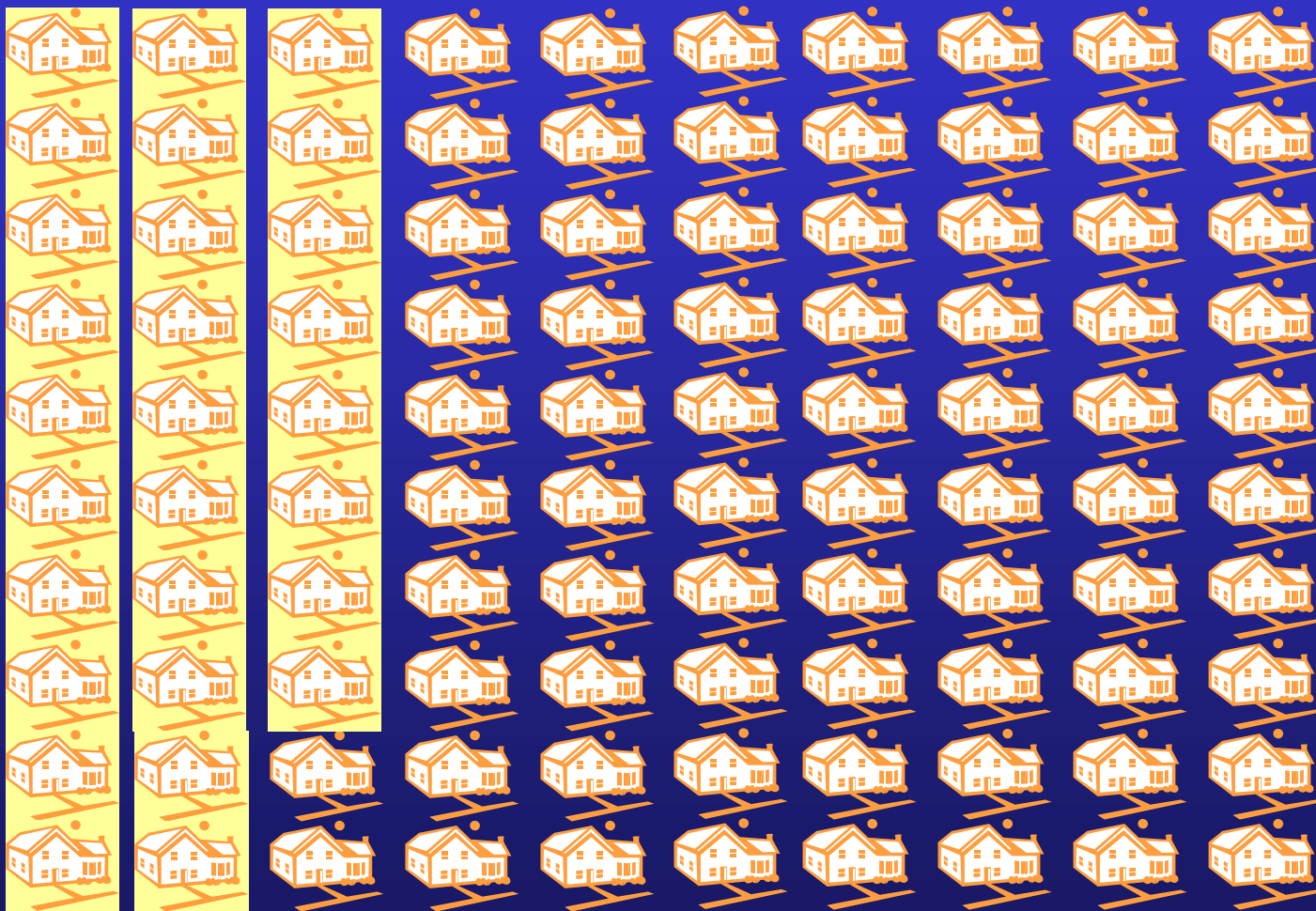
1 in a thousand



Statewide – 50 % of Maine homes may have indoor air levels of radon above 2 pCi/L



Statewide – Only 28% of Maine homes report that they have tested their indoor air for radon



Rest of talk

Background – what is radon?

How does radon enter homes and us?

What do we do about it?

What is Maine CDC doing in response to this problem?

Discovery of Radon in Homes



mid-1950's

A youth in Maine was playing with an civil-defense geiger counter and detected activity around a large water tank. Ultimately determined to be due to radon in well water. Led to focus on radon in well water.

Discovery of Radon in Homes



**December 1984
Limerick Nuclear Power
Plant:**

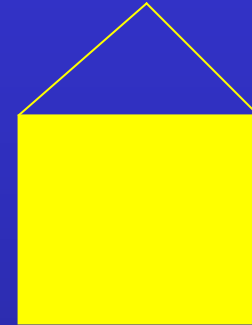
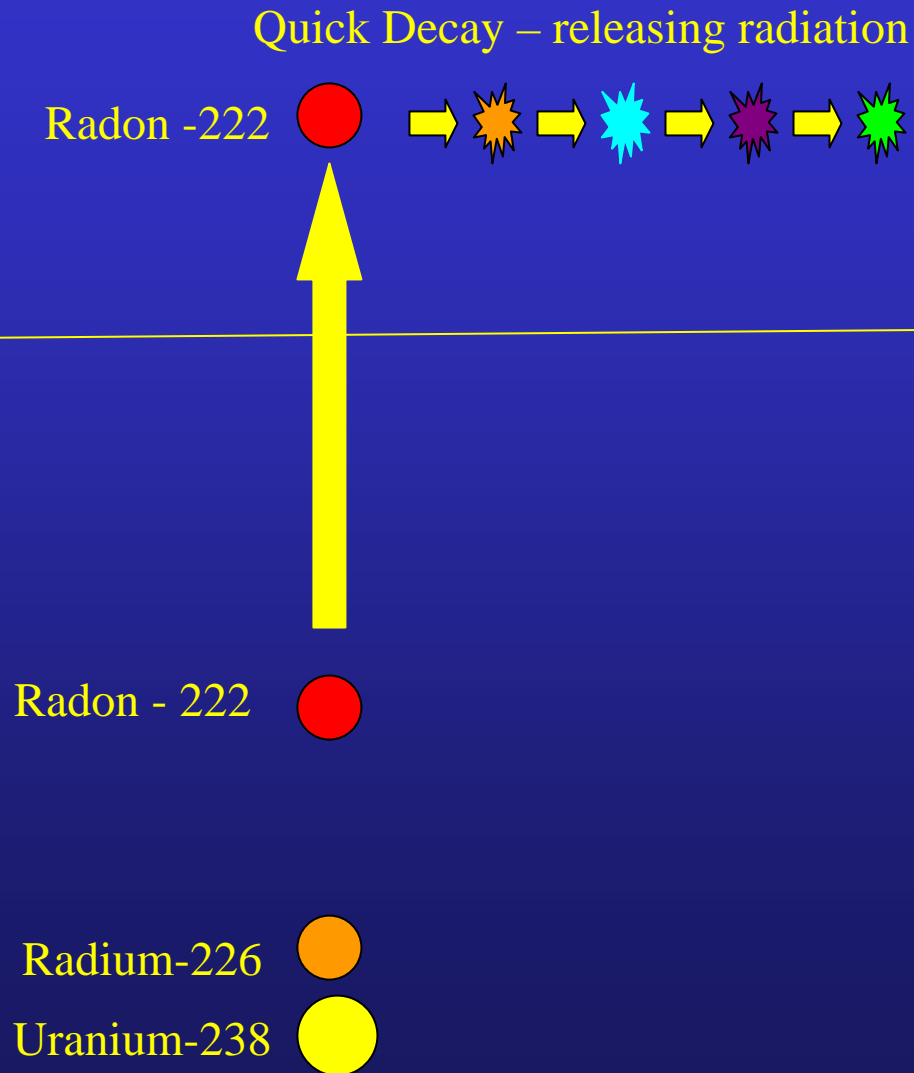
**Engineer named Stanley
Watras repeatedly sets off
new radiation alarms at
plant.**

Has his home tested.

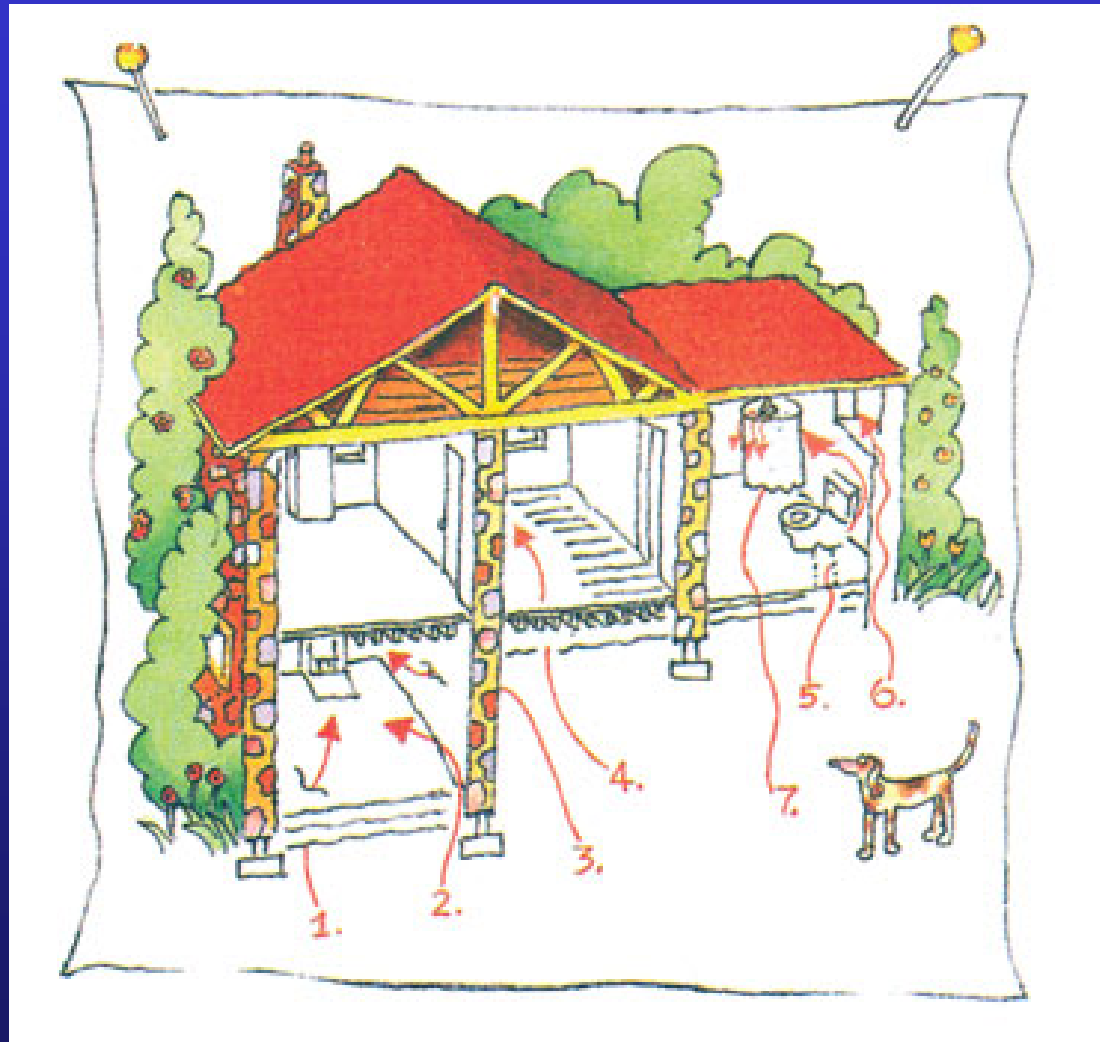
2,700 pCi/L

Told to leave his home.

What is Radon?



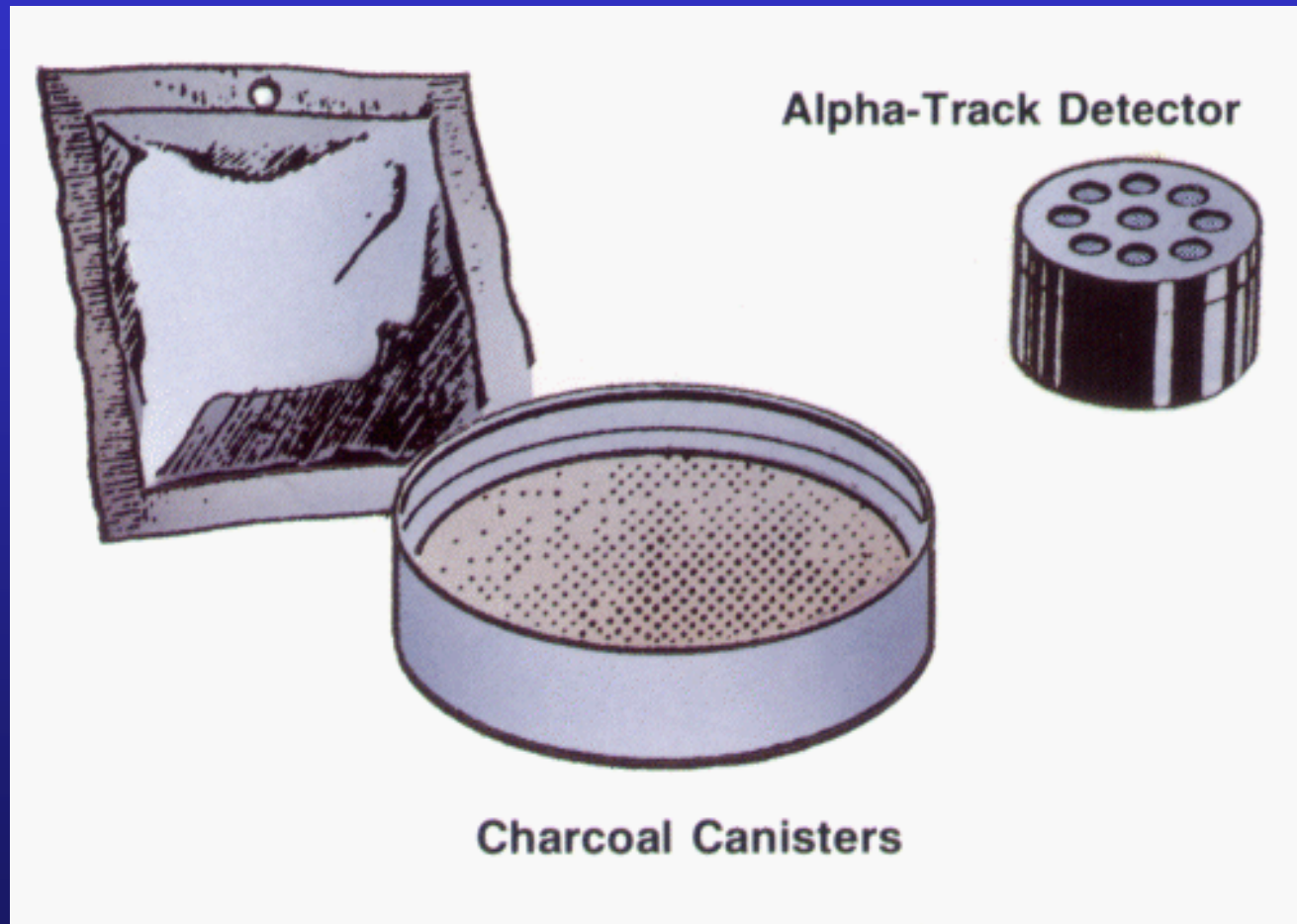
How Radon Enters a Home



**Through the
foundation**

Through the well

How do I find out if radon is in my house?



Notes on Testing Well Water

- Well Water contributes to air
- Testing well water is tricky –
 - levels can fluctuate,
 - the act of testing can reduce the level in the well water.

Where can I get a test kit?

If you are testing a home as part of a housing transaction

- the test must be performed by a certified radon tester
- the sample must be analyzed by a certified testing laboratory
(see www.maineradiationcontrol.org for a list)

Required by the *Maine Radon Registration Act*

What do I do with these new numbers?

DO NOT automatically treat air above 2 pCi/L.

- **Between 2- 4 in air, call us.**
- **High levels, obviously treat.**

DO NOT automatically treat above 4,000 pCi/L in well water.

- **Need BOTH air and well water measures**
 - **Between 4,000-10,000 in well water, call us.**
 - **High levels, obviously treat.**

How do I reduce high radon levels?

Contact a radon mitigation contractor

They're registered by the State. Lists are available from the Maine Radon Control Program.

1-800-232-0842 www.maineradiationcontrol.org

What will treatment cost?

Air Treatment - ~\$1,200

Well Water Treatment –

GAC - ~\$1,000

Aeration - ~\$5,000

Next Steps at MeCDC

- Get **EVERYONE** to test
- Simplify material
- Evaluate

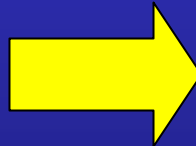
Simplification of the “Citizen’s Guide”



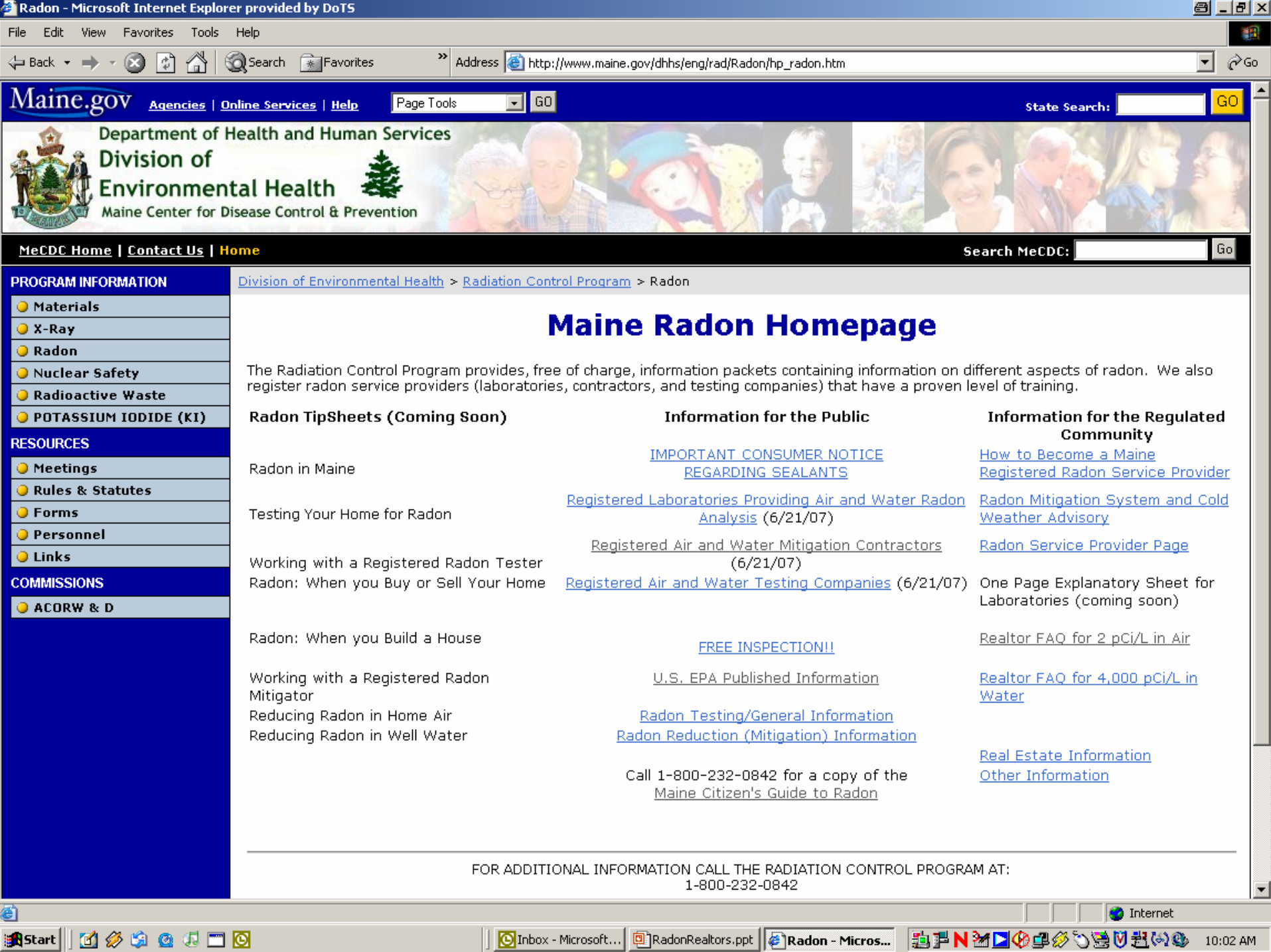
Maine Department of Human Services
Bureau of Health
Radiation Control Program

A Maine Citizen's Guide to Radon

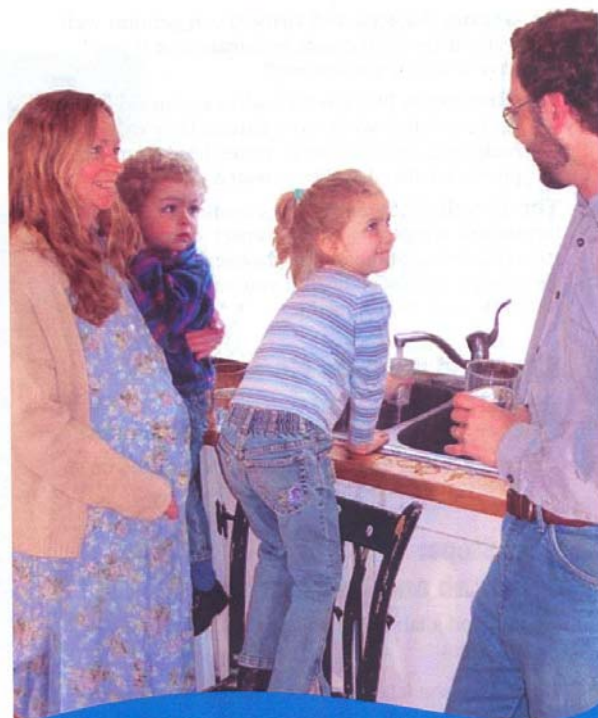
The Guide to Protecting
Yourself and Your Family
from Radon



1. Radon in Maine
2. Radon: When you Buy or Sell a House
3. When you Build a New Home...Use Techniques to Reduce Radon Dangers
4. Treatment Systems to Reduce Air Radon Levels in Your Home
5. Treatment Systems to Reduce Radon in Your Well Water
6. Testing your Maine Home for Radon...Working with a Registered Radon Tester
7. Working with a Registered Radon Reduction Expert – a registered contractor or ‘mitigator’



Is Your Well Water Safe to Drink?



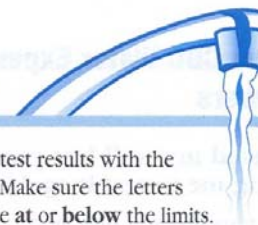
**Many Maine wells have too much
Arsenic • Radon • Uranium**

Protect your family. Test your well.

- Follow the **Well Testing Schedule** inside.
- Find a Maine lab certified for well water testing on the back page.

Maine Center for Disease Control and Prevention
Environmental and Occupational Health Program
Toll Free in Maine: 866-292-3474
<http://wellwater.maine.gov>

Well Testing Schedule



How to Read the Safe Limits

Compare the numbers and letters on your test results with the numbers and letters under the Safe Limits. Make sure the letters match and that your test result numbers are **at or below** the limits.

Well Problem Can Cause Safe Limit

Test Every Year

- Bacteria Diarrhea and Vomiting 0
If coliform bacteria test is positive,
test for E. coli bacteria
- Nitrate Nitrogen Infant blood problems 10 mg/L or less
- Nitrite Nitrogen Infant blood problems 1 mg/L or less

Test Every 3 to 5 Years

- Arsenic Cancer/Low Birth Weight 10 ug/L or less
- Radon Cancer 4,000 pCi/L
or less
- Uranium Kidney Problems 20 ug/L or less
- Lead - First Draw Test Brain Damage 10 ug/L or less
if planning a baby, pregnant,
or have a child under age 6
- Fluoride Too little - increased chance
of tooth decay Between 0.6 mg/L
and 1.7 mg/L
Too much - stained teeth

Other Times to Test Your Well:

- You're expecting a baby.
- Your water changes in smell, taste, or color. Drink bottled water. Call us to learn which tests to do.
- You put in new parts to the system, like a new pump or new pipes or water softener. Test for bacteria.
- The well runs dry and comes back. Test for bacteria.
- You put in a water treatment system to fix a problem. Test the treated water each year for that problem.

If you're not 100% sure you understand your water test results, call us.

Maine CDC Toll Free in Maine: 866-292-3474 or <http://wellwater.maine.gov>

Environmental & Occupational Health Program

- Home
- Well Water
- Fish and Game
- Guidelines
- Childhood Lead
- Chemicals
- Air Quality
- Environmental Public Health Tracking
- Occupational Disease Reporting
- About Us
- Site Map

wellwater.maine.gov

Different agencies within the State of Maine provide information on well water safety. Use this page to link to the right agencies.

To Test Your Water

"Is Your Well Water Safe to Drink?" A brochure identifying for what and how often you should test (Occupational and Environmental Health Program)

Maine Water Testing Labs (Health and Environmental Testing Laboratory)

Labs for doing Radon Testing (Radon Program)

If I find a Problem

Arsenic, Uranium and other Chemicals (Environmental and Occupational Health Program)

Radon (Radon Program)

Lead (Lead Poisoning Prevention Program)

Fluoride (Oral Health Program)

How do I fix the Problem?

Help in paying for treatment (Maine State Housing Authority)

To Choose a Treatment System (Drinking Water Program)

Choosing a Radon Treatment Company (Radon Program)

To make sure a treatment system is certified to remove a contaminant (NSF International) **EXIT**

Other Useful Links

If you think your well has been contaminated by a sand/salt pile (Department of Environmental Protection)

Making Sense of your Radon Test Results

Next steps to protect your family

Step 1: Be clear about what you tested

Before you look at the numbers, be sure you know:

- Whether results are for water or air or both
- Whether water test results were for a private well. You need a radon water test *only* for well water, not for town or public supply.

If you are on well water and tested just your water, keep in mind that you also need to test your air.

Step 2: Pay attention to the numbers. Don't worry about "pCi/L"

The letters pCi/L are short for "picocuries per liter." This is a measurement scientists use. What matters to you are the **numbers**. Don't worry about those letters after the numbers.

Step 3: Make wise treatment decisions.

If you are on well water, be sure to test both your water and your air. You need results from **both** to decide whether and how to treat a radon problem.

High levels of radon in water and air can be reduced to fall within safety guidelines. Treating a radon problem is a smart health investment.

Understand Well Water Test Results

Safe levels of radon in well water measure below 4,000 pCi/L. If your well water number is:

- **10,000 or higher**
You need a treatment system (list on back).
- **Between 4,000 and 10,000** – maybe treat
Call us to discuss: 1-800-232-0842.
- **4,000 or lower**
Retest in 3 to 5 years.

Understand Air Test Results

Short-term tests (48-60 hours) are the most common, often done before homes are sold. If your **air test number** is:

- **4 or higher**
You need a treatment system (list on back).
- **Between 2 and 4** – maybe treat
Call us to decide how to lower your risk.
- **Below 2** and you tested in cold weather with the heat on—retest in 3 to 5 years. If you tested in warmer weather when heat is off, test again in cold weather when heat is on.

Radon: the 2nd leading cause of lung cancer



Radon is a serious health risk. Natural levels of radon are high in Maine. Technology can usually reduce radon air levels to below 2 and easily reduce water levels to below 4,000—the safest levels.

If you need to reduce radon levels in your home, be aware that contractors must be registered to reduce radon in water or air or both. See the list on back.

If radon is tested as part of buying or selling a house, a registered radon tester **MUST** be used.

Learn More. Request Radon Tip Sheets.

- Call for private advice: 1-800-232-0842
- Check this website: www.MaineRadiationControl.org

Maine CDC Radiation Control Program and
Environmental and Occupational Health Program
Department of Health and Human Services
11 State House Station, Augusta, ME 04333
Toll free in Maine: 800-232-0842
TTY: 207-287-8066



To Summarize:

Radon causes lung cancer

It is common in Maine

EVERYONE need to test

To get everyone testing we need to:

Develop effective material

Help folks interpret results

Evaluate efforts

QUESTIONS

Radon Program: 1-800-232-0842

<http://www.maineradiationcontrol.org>

Well Water: 1-866-292-3474

<http://wellwater.maine.gov>

My Contact Info: ehu@maine.gov