

# Radon In Maine

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Maine Department of Health & Human Services

# Radon – A Public Health Issue

Radon is the second leading cause of lung cancer

## News Release

FOR IMMEDIATE RELEASE

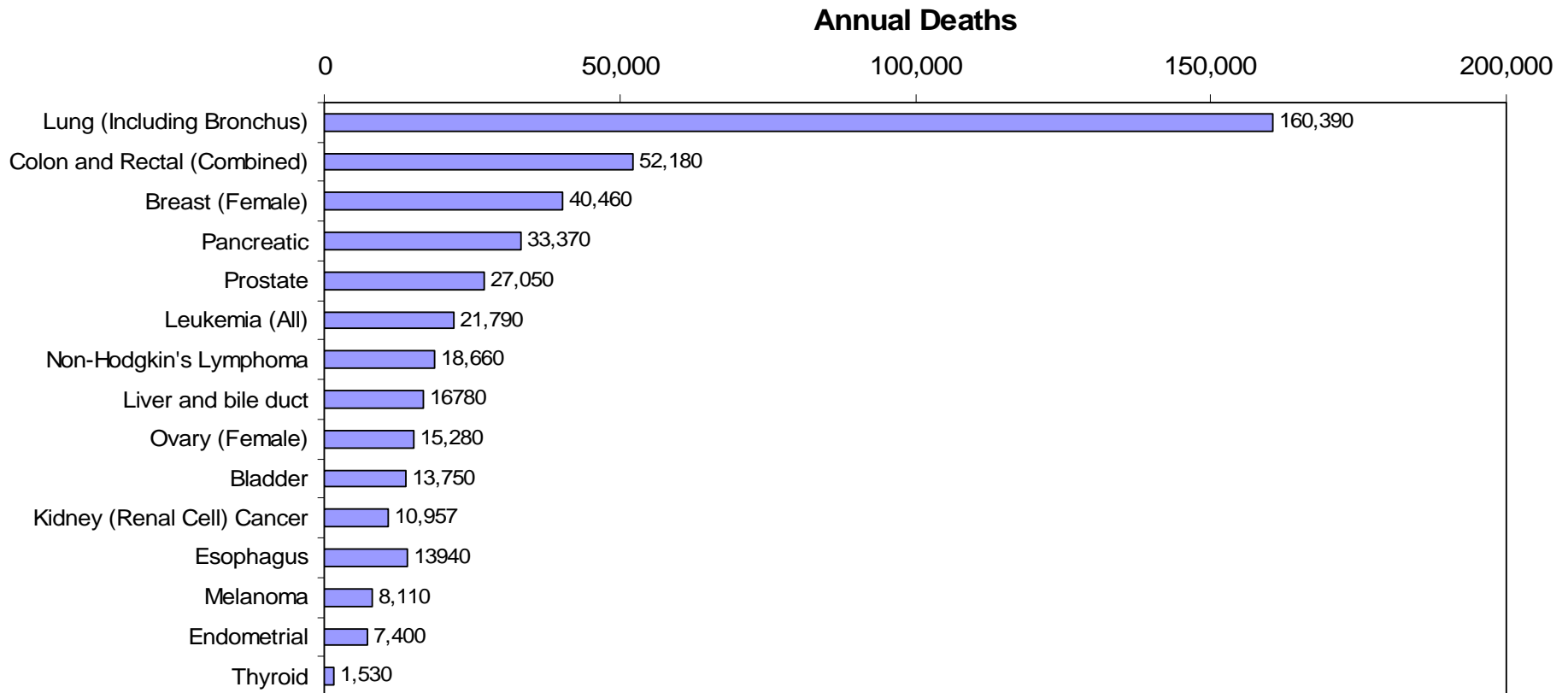
Thursday, January 13, 2005 Contact: HHS Press Office  
(202) 690-6343

### **Surgeon General Releases National Health Advisory On Radon**

U.S. Surgeon General Richard H. Carmona warned the American public about the risks of breathing indoor radon by issuing a national health advisory today. The advisory is meant to urge Americans to prevent this silent radioactive gas from seeping into their homes and building up to dangerous levels.

# Radon causes an estimated 21,000 lung cancer deaths in the U.S each year

## Annual Deaths for Common Cancers

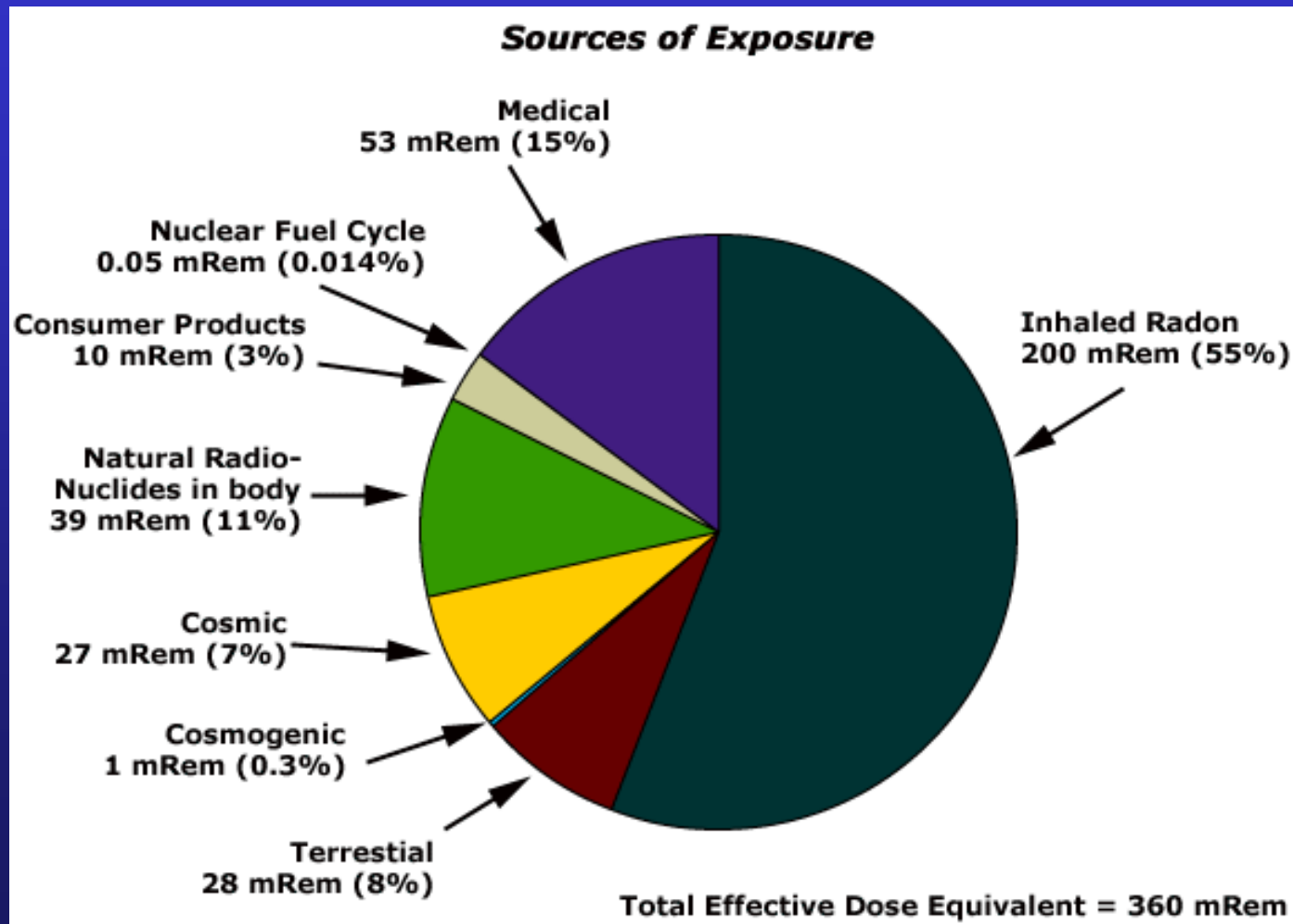


About 165 Lung Cancer Cases in  
Maine Each Year Are Thought To Be  
Caused By Radon

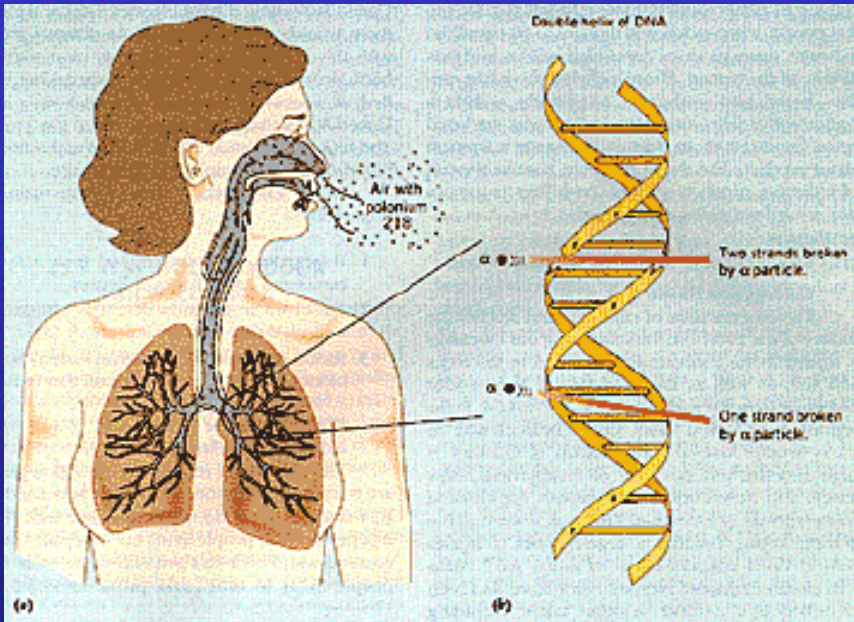
# Radon Is.....

- A naturally occurring gas
- Radioactive
- In the ground and water all over the world

# Sources of Exposure to Radiation



# How Radon Enters our Bodies



Inhalation of radon gas is the major route of exposure.

Even for radon in water.

Radon decay products become bound to fine particulate matter that can become deposited in our lungs

# How do we know Radon causes Cancer?

## Three Major Lines of Evidence

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

# Estimated Lung Cancer Risk from Exposure to Radon

<b>Radon Level</b>	<b>If 1,000 people who smoked were exposed to this level over a lifetime* ...</b>	<b>If 1,000 people who never smoked were exposed to this level over a lifetime*...</b>
<b>20 pCi/L</b>	260	36
<b>10 pCi/L</b>	150	18
<b>8 pCi/L</b>	120	15
<b>4 pCi/L</b>	62	7
<b>2 pCi/L</b>	32	4
<b>1.3 pCi/L</b>	20	2

\* Lifetime risk of lung cancer deaths from EPA Assessment of Risks from Radon in Homes (EPA 402-R-03-003).

# Radon in Air

- **If Radon Levels are equal to or above 4 pCi/L**
- **Recommend taking action to reduce radon levels**
  
- **If Radon Levels are between 2 and 4 pCi/L**
- **Consider taking action to reduce radon levels**
  
- **If Radon Levels are less than 2 pCi/L**
- **Reducing radon levels below 2 pCi/L may be difficult**

## Radon in Water:

- Maximum exposure guideline (MEG)- 4,000 pCi/l.
- At 4,000 pCi/l, look at total radon risk and decide what to fix.
- As radon approaches 10,000 pCi/l, it becomes more important to fix regardless of air concentration.

# Discovery of Radon in Maine



2006 www.civildefensemuseum.com

## Shelter Radiation Kit of Materials (CD V-777-1)

- |  |                                      |
|--|--------------------------------------|
| 1 CD V-700 Geiger counter (0-50 mr/hr) | 1 CD V-715 Survey meter (0-500 r/hr) |
| 2 CD V-742 Dosimeter (0-200 r)         | 1 CD V-750 Dosimeter charger         |

## 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 water. Led to focus on radon in water.

# Response

- 1950s to early 1980s- Research & recommendations
- Mid 1980s- participate in national effort
- Late 1980s to today- Maine radon regulations & Maine State Indoor Radon Grant from US EPA.

# Maine Regulates Radon Companies & Workers

- Maine Radon Registration Act (22 MRSA Ch 165 §771 et seq.). Passed in 1989
- Gives authority to regulate companies and individuals that offer air and/or water radon services
- Allows limited exemptions
- Sets penalties, fees, reporting requirements, etc.

# Maine Regulations Include:

- The nuts and bolts of getting registered and staying registered
- Required reporting (our data collection)
- General performance standards
- What happens when a company or individual doesn't abide by the radon law or rules.

# We Regulate:

- Labs
- Testers
- Mitigators
- People consulting on radon
- Radon test devices

# We Do Not Regulate

- Equipment manufacturers
- Treatment equipment
- Diagnostic devices

# Radon Section Details

- 90% federal grants
- 10% regulatory fees
- 0% Maine general funds
- 2 FTE
- Administer regulatory program and grants

# Surveillance

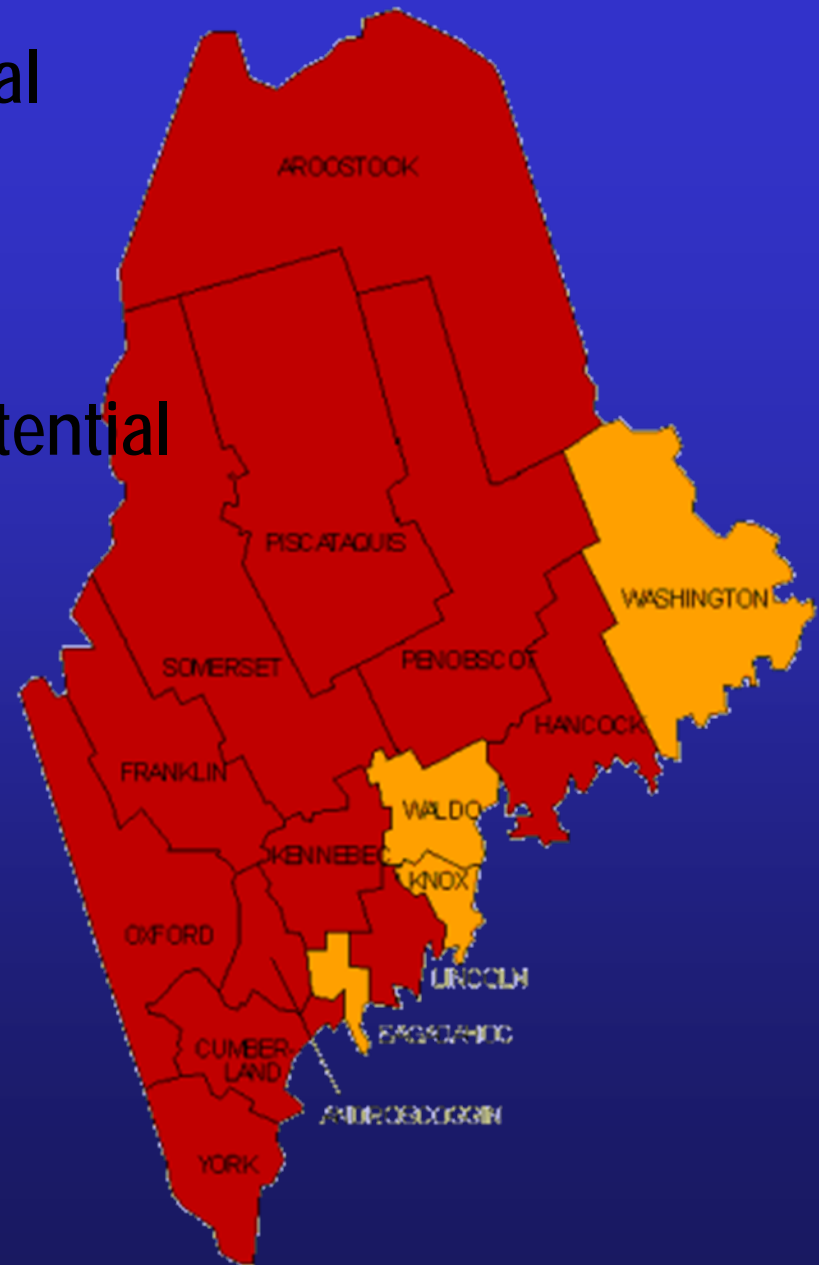
- Data from required regulatory reporting
- BRFSS

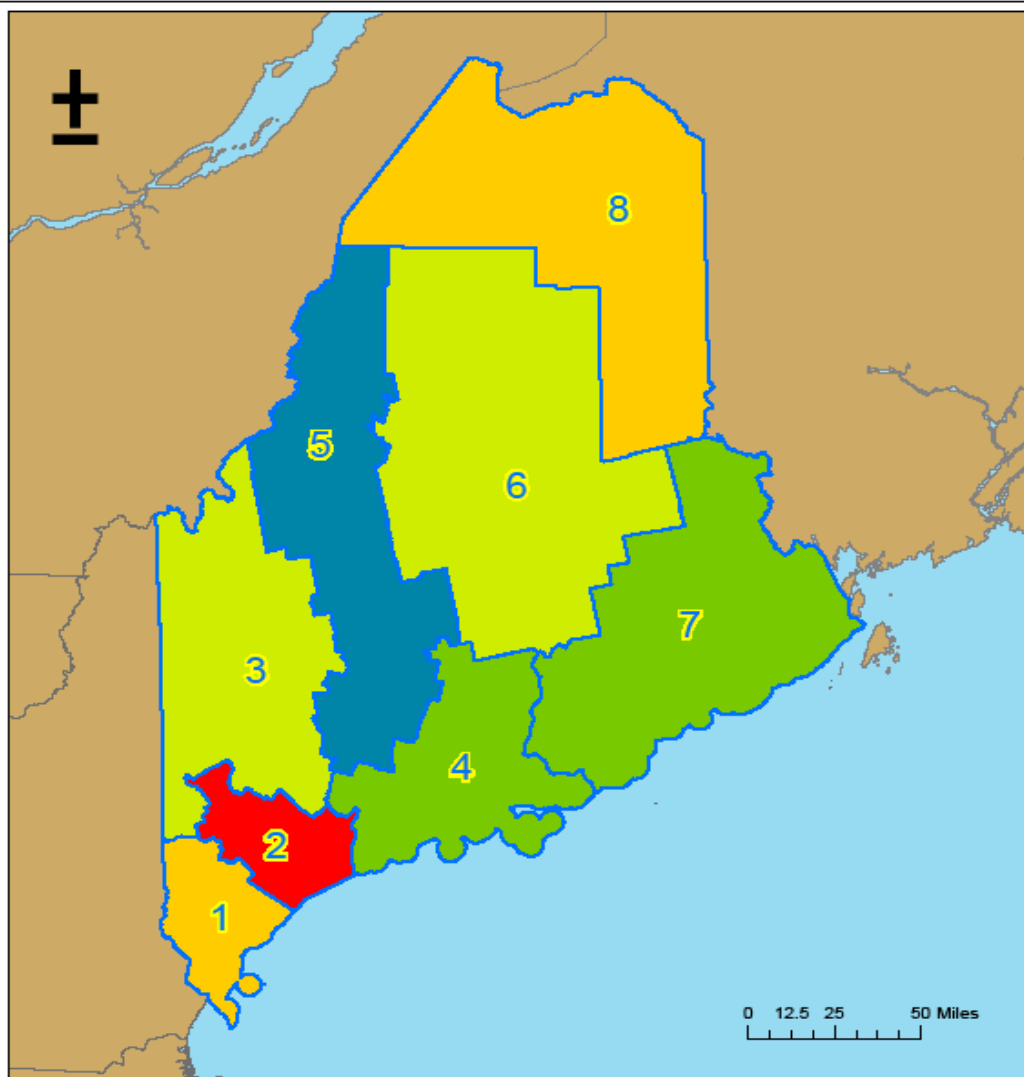
# The Data

- Historically received only zip code & result.
- Recent law change to also require street address.
- Reporting compliance is spotty.
- No time/staff to properly utilize data.
- In an archaic database manager.

■ Zone 1- high radon potential  
(likely 4 pCi/l or higher)

■ Zone 2- moderate radon potential  
(likely 2-4 pCi/l)





### **Average Radon Activity**

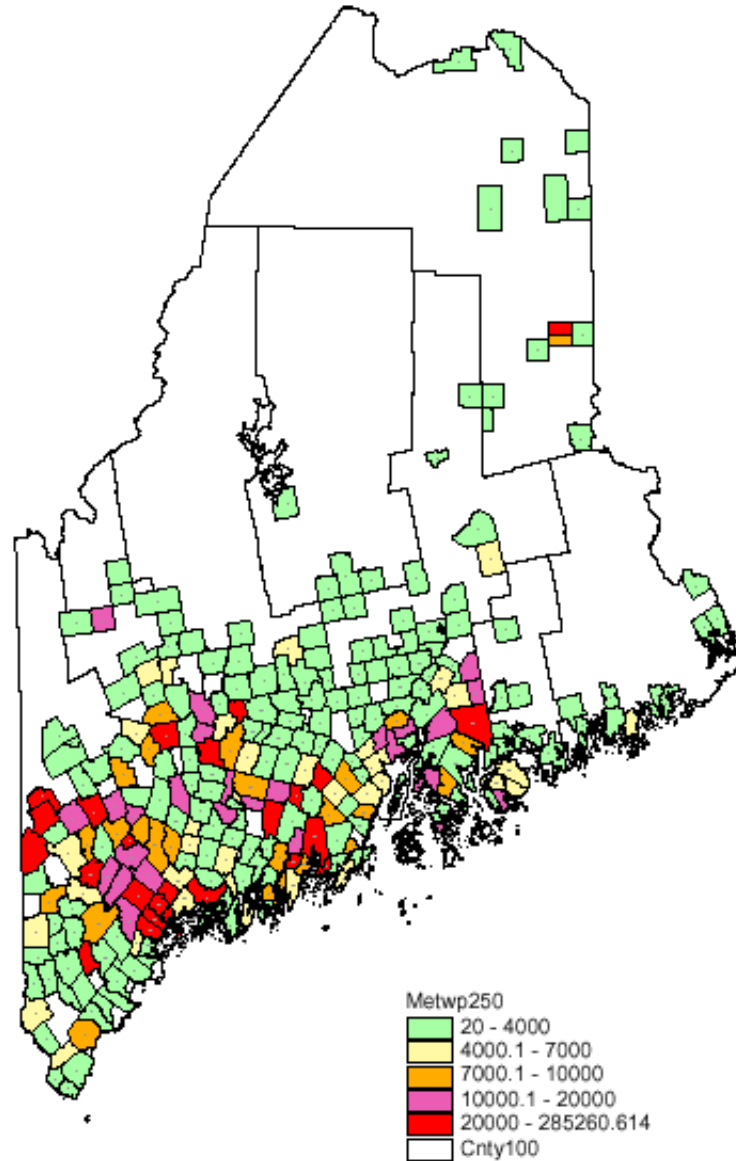
By DHHS District

A publication of the Radiation Control Program  
Department of Health and Human Services

#### **Legend**

Activity (pCi/L)		
3.9	5.0 - 5.9	8.0 - 8.9
4.0 - 4.9	6.0 - 6.9	<10 Counts
	7.0 - 7.9	

# Non-Random Residential Radon Water Data in pCi/L



# Radon in Maine

- About 1/3 of homes statewide have high radon.
- Range (by county) is 20% to over 60%.
- Highest confirmed radon air result-  
1,200 pCi/l.
- Highest confirmed radon H<sub>2</sub>O result-  
2.2 million pCi/l.

# More Radon in Maine

- A statistically valid survey showed the average radon level in Maine is 4.1 pCi/l.
- BRFSS shows about 30% of Maine homes have tested for radon.
- BRFSS and anecdotal info from regulatory data show less than 50% of high radon homes are mitigated.

# Primary Prevention

- Technical support & guidance through regulatory program
- Limited outreach
- Guidance and public info materials
- Projects and efforts to get radon issues into the “infrastructure.”

# 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 discuss: 1-800-232-0842.
- **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 Gas: 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.

- Check this website: [www.MaineRadiationControl.org](http://www.MaineRadiationControl.org)
- Call for advice: 1-800-232-0842 • TTY: 800-606-0215



Maine Center for Disease  
Control and Prevention

An Office of the  
Department of Health and Human Services  
Division of Environmental Health

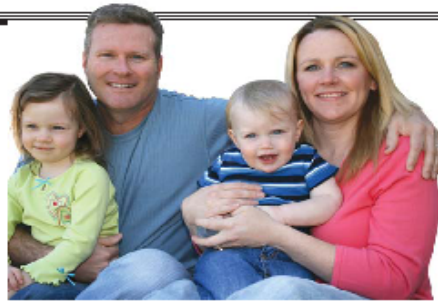
John E. Baldacci, Governor

Brenda M. Harvey, Commissioner

# Radon in Maine

A Serious Hidden Danger to Family Health

Radon Tipsheet #1



## Living in a home with high radon levels is a major risk for lung cancer.

Radon is the 2nd leading cause of lung cancer. Studies in thousands of homes around the world show radon causes lung cancer at levels like those found in Maine.

High levels of radon gas occur naturally in Maine soil and water, and can move up into a house from the ground. The house then traps the radon in the air inside. Radon gas can also dissolve into well water, which is then released into the air when you use the water. Simple air and well water tests can show whether home radon levels meet state and national safety guidelines.

## Any home can have a radon problem. Testing is the only way to find a problem.

Any house can have a radon problem. It doesn't matter if it's old or new, or where it's located. The only way to know if your house has a problem is to test.

You can test your air and well water with simple test kits purchased from Maine registered testing labs for about \$60 or less. Or, you can hire a registered radon tester. If you have a well, you need to test it along with your air. To find out where to buy test kits or to hire a registered tester:

- Go to this website: [www.MaineRadiationControl.org](http://www.MaineRadiationControl.org) or call : 1-800-232-0842
- Use the Tipsheets: #2 *Testing Your Home for Radon* and #5 *Working with a Registered Radon Tester*.

A registered radon tester must be used if you are selling your home.

## Treatment systems work to lower radon levels in air and well water.

Radon problems can be fixed. Once you test and know your radon numbers, you can plan the next steps. Current methods make it possible to get levels in most houses:

- air levels: around 2 pCi/L or below
- well water levels: 4,000 pCi/L or below.

Read pCi/L as "picocuries per liter" — but just the number matters.

If both air and well water tests are done, the results must be considered together to decide on the best and most cost effective fix.

**Fixing a radon problem should be done by an expert—a registered contractor.** In Maine, contractors are registered separately to fix problems with radon in air and problems with radon in well water. Use the website below to get a list of registered contractors. Use Tipsheets #6 and #7 about radon treatment systems.

## Protect your family. Learn. Test. Treat if needed.

- Check this website: [www.MaineRadiationControl.org](http://www.MaineRadiationControl.org)
- Call for advice: 1-800-232-0842 • TTY: 800-606-0215



Maine Center for Disease  
Control and Prevention  
An Office of the  
Department of Health and Human Services

Dr. E. JoAnn Desrosiers

Debra M. Hays, Commissioner

October 2008

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## Radon in Rental Housing A Serious Hidden Danger to Family Health

Radon Tipsheet #11



**Renting a home with high radon levels is a major risk for lung cancer.**

Radon is the 2nd leading cause of lung cancer. Any home, including rental housing, can have a radon problem. It doesn't matter if it's old or new, or where it's located. High levels of radon gas occur naturally in Maine soil and water, and can move up into a house from the ground. The house then traps the radon in the air inside.

**The only way to know if a home has a problem is to test.** Landlords in Maine are required to test their rental properties for radon by the year 2012. This tipsheet can help you understand how radon testing in rental housing works.

### About Radon Testing in Rental Housing

Maine requires landlords to test all residential rental properties by 2012, and re-test every 10 years.

Simple air tests can show whether radon levels are safe. Only registered radon testers can conduct a radon test. They will put radon test devices in the building, usually in the basement or in ground floor units. Sometimes they will test units on other floors.

### What Tenants Need to Do

- Do not touch, move, cover or otherwise interfere with the testing devices.
- For 12 hours before, and all during the test, keep windows and doors closed, except for normal entry and exit.
- **IMPORTANT:** If the test is not done the right way it must be done again, **costing time and money for the landlord and tenant.**
- Your landlord must show you the results for your residence. If your residence was not tested, you will get the results from the basement or the highest result found in your building.

### About High Radon Levels

A radon concentration of 4 pCi/l (picocuries per liter) or above is a high radon level. If there is a high radon level in your building, your landlord must fix the problem within six months.

Only registered radon reduction contractors, called radon mitigators, can fix high radon levels in rental housing. Radon mitigators can install the proper system to make sure that your home and all the others in your building, have safe radon levels.

Radon treatment systems work well to bring the level down to safer levels, no matter how high the levels are to start.

### Follow-Up Testing

Once your building has a radon mitigation system, there will be another radon test and periodic re-tests to make sure the system is working. In addition, landlords must conduct a test of the whole building every 10 years.

### Protect your family. Learn. Test. Treat if needed.

- Check this website: [www.MaineRadiationControl.org](http://www.MaineRadiationControl.org)
- For advice: 1-800-232-0842 • TTY: 800-606-0215 • [radon.dhhs@maine.gov](mailto:radon.dhhs@maine.gov)



Maine Center for Disease Control and Prevention  
Department of Health and Human Services

Radon in Rental Housing • May 2010

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DEPARTMENT OF HEALTH & HUMAN SERVICES  
MAINE CDC, DIVISION OF ENVIRONMENTAL HEALTH  
Radiation Control Program, Radon Section  
#11 STATE HOUSE STATION  
AUGUSTA, ME 04333-0011

Telephone (207) 287-5698 or 800-232-0842 Email radon.dhhs@maine.gov  
**Updated 04/01/11**      **Next Update in About One Month**      **Valid to 10/01/11**

**REGISTERED CONTRACTORS PROVIDING  
AIR AND WATER RADON MITIGATION**

Please note: This list is in the order that the companies registered for the current year.  
Position on the list does not indicate that one company is better than another.  
*Also Please Note: Maine electrical and plumbing laws require that electrical or plumbing work  
that is part of a radon mitigation must be done by a licensed electrician or plumber.*

In an effort to provide current information to the public, please advise this office  
of any difficulties you may encounter contacting any individual or firm listed below.  
Any duplication of this material shall be performed in its entirety. If we can be of further  
assistance, please feel free to contact this office.

**State of Maine Radon Website: [mainerradiationcontrol.org](http://mainerradiationcontrol.org)**

Radon Done Right, LLC 10 St. Joseph Ave. Lewiston, ME 04240 866-997-2366	Air & Water Mitigation ME ID #ME19900C Expires 10/1/2011
Aaron Radon Mitigation 68 High Street #201 Saco, ME 04072 207-282-6026	Air & Water Mitigation ME ID #ME20300C Expires 10/1/2011
Radon Systems LLC 787 Deering Ridge Road E. Waterboro, Maine 04030 207-247-8181	Air Mitigation ME ID# ME13100C Expires 10/1/2011
Norlen's Water Treatment Service, LLC P.O. Box 46, Rte. 15 Orrington, ME 04474 207-825-4964	Air & Water Mitigation ME ID #ME03000C Expires 10/1/2011
Affordable Water Treatment P.O. Box 339 Litchfield, Maine 04350 207-268-2987	Water Mitigation ME ID # ME14400C Expires 10/1/2011
The Maine Radon Mitigation Company, LLC P.O. Box 284 Hamden, ME 04444 207-249-8726	Air & Water Mitigation ME ID # ME21900C Expires 10/1/2011
Maine Coast Construction Corp.	Air Mitigation

We currently have no measures in place to assess impact or effectiveness of outreach or guidance.

# Primary Prevention under attack

- Maine Uniform Building and Energy Code -includes a radon new construction standard. Could be repealed this session.
- An Act to reduce Lung Cancer Rates In Maine -requires radon testing in all residential rental properties. Three bills to weaken, a task force report says to repeal.

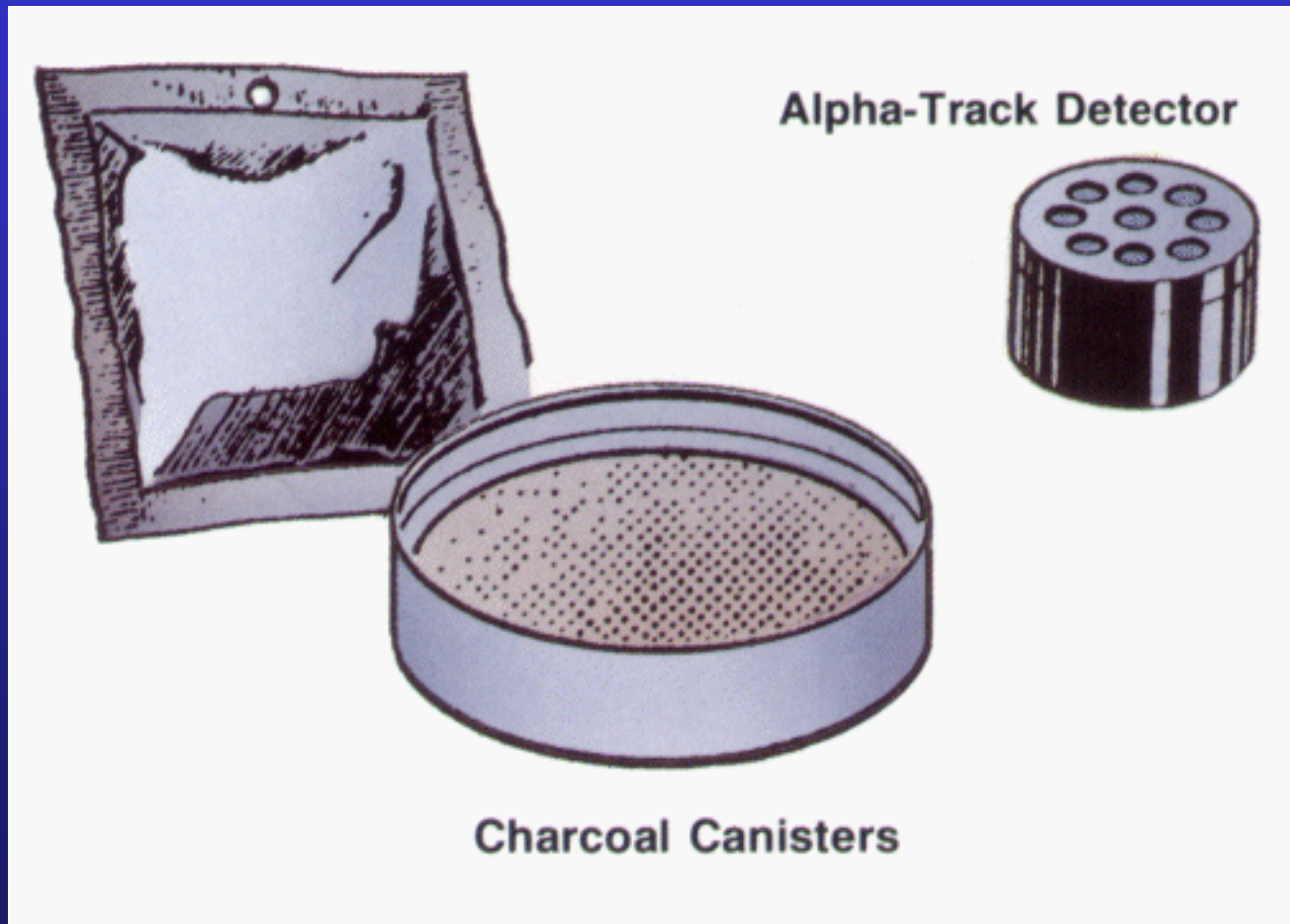
# Prevention Project

- Pilot project to see if it is feasible to include radon testing and mitigation to weatherization of low income homes.

# Case Management

- Voluntary, voluntary, voluntary
- Driven mostly by real estate sales (non-rental)
- No resources to help with mitigation

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



# How do I reduce high radon levels?

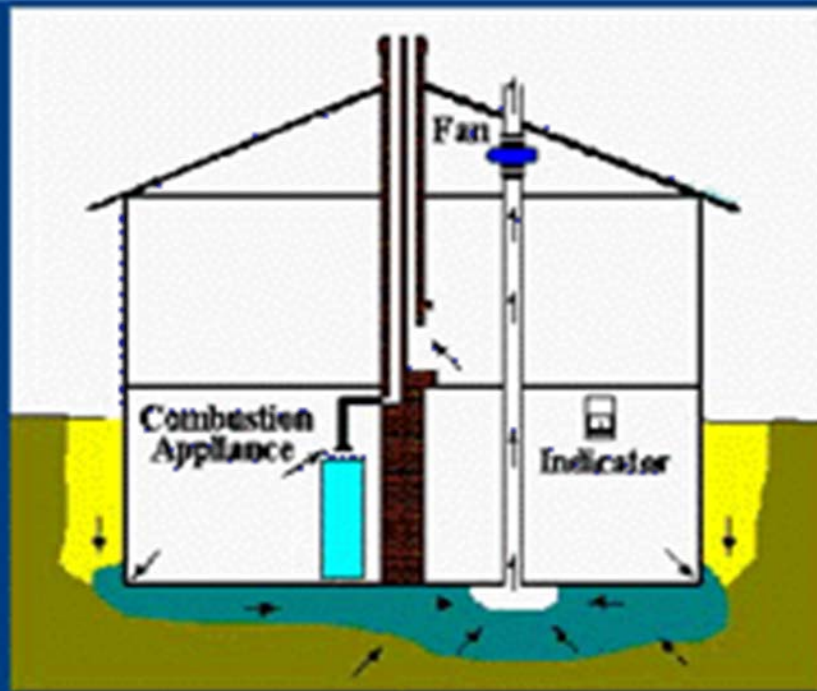
**Contact a radon mitigation contractor**

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

**1-800-232-0842   [www.maineradiationcontrol.org](http://www.maineradiationcontrol.org)**

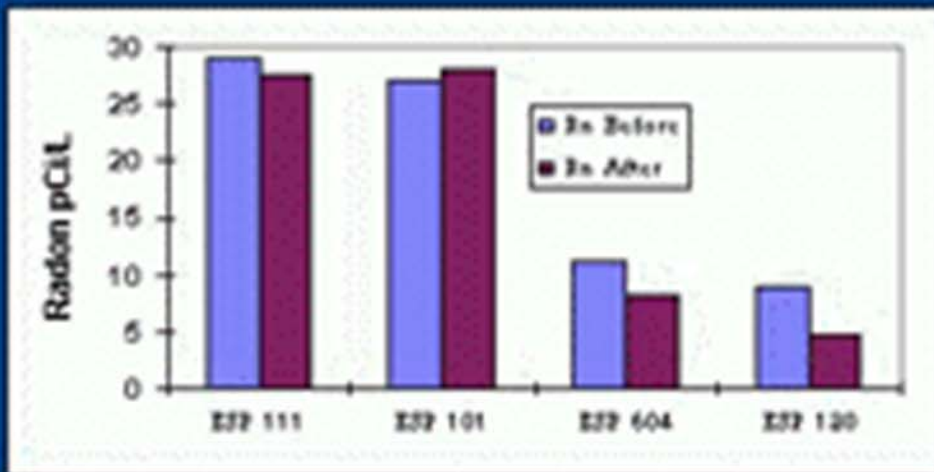
# Radon Air Fix

## ASD: Sub-Slab Depressurization (SSD)



- Suction created by fan draws radon from beneath a concrete slab and vents the radon outdoors.

# Caulking and Sealing is Not a Stand Alone Technique



- There are too many openings in a home to be able to totally seal out radon.
- However, sealing enhances standard radon systems.

# Radon Water Fix #1



## Water Mitigation

- Granular activated carbon (GAC, often called a 'carbon filter')
- Creates gamma radiation, can become low-level radioactive waste.
- Cost \$1000- \$1,500

# Radon Water Fix #2



## Water Mitigation

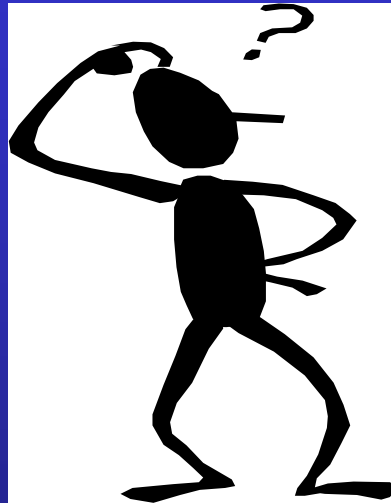
- Aeration system (often called a bubbler)
- No radiation, disposal issues
- Air used for aeration might pollute water
- Cost \$4000- \$5,000



# Radon Policy

- Driven by a combination of National guidance and state law:
  - Action level- air- national guidance
  - MEG- h<sub>2</sub>o- State derived but basis is national guidance
  - testing & mitigation- combination of national guidance & state law.

# QUESTIONS



Maine Radon Section  
1-800-232-0842 (in Maine only)  
207-287-5698  
[radon.dhhs@maine.gov](mailto:radon.dhhs@maine.gov)