

# RADON: WHAT THE PUBLIC AND POLICY MAKERS NEED TO KNOW



UNIVERSITY OF  
KENTUCKY®

COLLEGE OF NURSING, CLEAN INDOOR AIR PARTNERSHIP

## **RADON: WHAT THE PUBLIC AND POLICYMAKERS NEED TO KNOW .....**

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### **A full copy of this report can also be viewed at:**

<http://www.mc.uky.edu/tobaccopolicy/ProjectTeam/Radon.HTM>

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## INTRODUCTION

Radon is a radioactive colorless, odorless, and tasteless soil gas.<sup>1</sup> It becomes trapped in indoor spaces. Radon is the second leading cause of lung cancer.<sup>2</sup> Homes, workplaces and schools should be tested and mitigated if the radon level is at or above 4 pCi/L.<sup>3</sup>

The purpose of this report is to provide information regarding the health risks associated with radon; ways of identifying and fixing radon problems; and existing radon policy and potential policy alternatives. The intended audience is community advocates, policymakers, public health officials, healthcare providers, and the general public.

Radon is a human carcinogen that derives from the naturally-occurring breakdown of uranium.<sup>4</sup> Exposure to radon is associated with an estimated 15,400 to 21,800 cases in United States each year.<sup>4</sup> It is estimated that between 3-14% of the total lung cancer cases are linked to radon.<sup>1</sup> Most radon-induced lung cancers are thought to be associated with low to moderate radon concentrations.<sup>1</sup> Exposure to both tobacco smoke and radon gas multiplies one's chances of developing lung cancer. There are more radon-related lung cancers in persons with a history of smoking.<sup>3,4</sup>

Radon enters homes and other buildings through cracks in foundations, as well as sump pumps and other drainage systems. Problems occur when radon enters the structure, becoming trapped in the indoor air environment. The only way to know if a home or other building has a radon problem is to have it tested. Radon test kits and testing services are widely available through public health departments, professional testing companies, and retail stores. When a radon problem is found, it is recommended that the problem be corrected by a National Environmental Health Association (NEHA) certified radon mitigation professional.

The Environmental Protection Agency (EPA) has a voluntary national program that establishes technical guidelines for identifying and fixing radon problems; develops national public service announcements; and oversees federal monies for use by states in maintaining their state radon programs. In addition, the Occupational Safety and Health Administration (OSHA) regulates ionizing radiation in places of employment.<sup>5</sup>

In over two decades since the passage of the 1988 Indoor Radon Abatement Act (IRAA), exposure to indoor radon continues to grow. These reasons include: (a) the voluntary nature of the EPA program; (b) lack of support from realtors who risk the potential loss of a sale; and (c) lack of support from builders who view the use of radon-resistant building techniques as expensive. The EPA needs to consider development of policy strategies for achieving the long-term goal of the IRAA.<sup>6</sup>

Despite the absence of effective national radon policy, comprehensive radon legislation exists in many states. These laws vary and include mandatory testing in schools and daycares, mandatory disclosure of testing as part of a real estate transaction, certification and regulation of the radon testing and mitigation industry, and radon-resistant new construction requirements. Most of the states bordering Kentucky mandate regulation of radon testing, mitigation and laboratory companies.

Kentucky has two laws that affect radon policy. K.R.S. 211.8557 through KRS 211.858 direct the Cabinet for Health and Family Services to promulgate administrative regulations to oversee all radon testing, mitigation and laboratory activities. This set of statutes was promulgated in 2005 by the Cabinet for Health and Family Services but were not adopted at that time.

## **RADON: A MATTER OF PUBLIC HEALTH**



### **WHAT IS RADON?**

- Radon is a naturally occurring radioactive soil gas that is colorless, odorless and tasteless.<sup>1</sup>
- Through decay, radon breaks down into hazardous particles which can be inhaled.<sup>1</sup>
- Radon levels are measured by units of radioactivity per volume of air called picocuries per liter (pCi/L).<sup>3</sup>

### **HOW DOES RADON AFFECT HEALTH?**

- Radon is a form of ionizing radiation and known to cause cancer in humans.<sup>7</sup>
- Radon decays into sticky radioactive particles that get trapped in the lungs when inhaled. As they are broken down further, these particles release small bursts of energy that damage lung tissue over time.<sup>7</sup>
- Radon exposure is the second leading cause of lung cancer, second only to cigarette smoking.<sup>2</sup>
- Living in a home with a radon level of 4 pCi/L is like getting 200 chest x-rays per year.<sup>7</sup>
- Living in a home with a radon level of 20 pCi/L is like smoking two packs of cigarettes per day.<sup>7</sup>

### **WHO IS AFFECTED?**

- Radon is linked to 15,400 to 21,800 lung cancer cases in the United States each year.<sup>4</sup> It is estimated that between 3-14% of the total lung cancer cases are linked to radon.<sup>1</sup>
- If you smoke and/or are exposed to secondhand smoke and your home or workplace has high levels of radon, the risk of getting lung cancer is especially high.<sup>8</sup>
- The average radon concentration in the indoor air of America's homes is about 1.3 pCi/L.<sup>3</sup>
- Nationally, approximately 7% of homes test at 4 pCi/L or above.<sup>3</sup> In Northern Kentucky, 19% of homes tested were at or above 4 pCi/L in 2000-2004.



“When my husband, Joe, was diagnosed with lung cancer and the oncologist told us that radon causes lung cancer, we had no idea what radon was and didn’t know we had been living with high levels in our home for many years. Now, my life is devoted to telling others about this silent killer and the ease of testing homes for radon and installing a mitigation system. Joe’s lung cancer was too advanced for treatment, but I live now and carry our love forward to help prevent future radon-induced lung cancer deaths.”

*Gloria Linnertz*

## RADON: A MATTER OF PUBLIC HEALTH

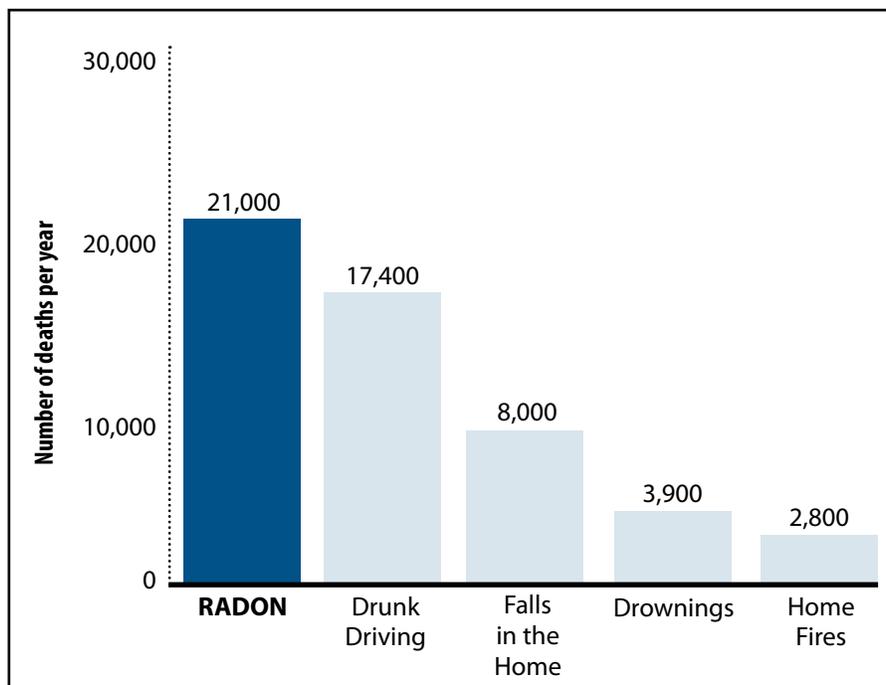
### SMOKING AND RADON

If exposed to 4 pCi/L of radon over a lifetime, 7 per 1,000 of those who never smoked would develop lung cancer versus 62 per 1,000 smokers.<sup>3</sup>

Among never-smokers, radon exposure may be more harmful for those exposed to secondhand smoke.<sup>9</sup> Secondhand smoke particles linger in the air and are small enough to be inhaled directly into the lungs. The combination of radon attached to the fine particles from secondhand smoke greatly increases the likelihood of lung cancer. This combination makes it easier to breathe in the particles and easier for those particles to stick to the lungs.<sup>3</sup>



### PREVENTABLE CAUSES OF DEATHS PER YEAR FROM RADON AND OTHER CAUSES, U.S., 2003



**NOTE:** Chart provided by the Environmental Protection Agency.

## WHERE IS RADON FOUND?

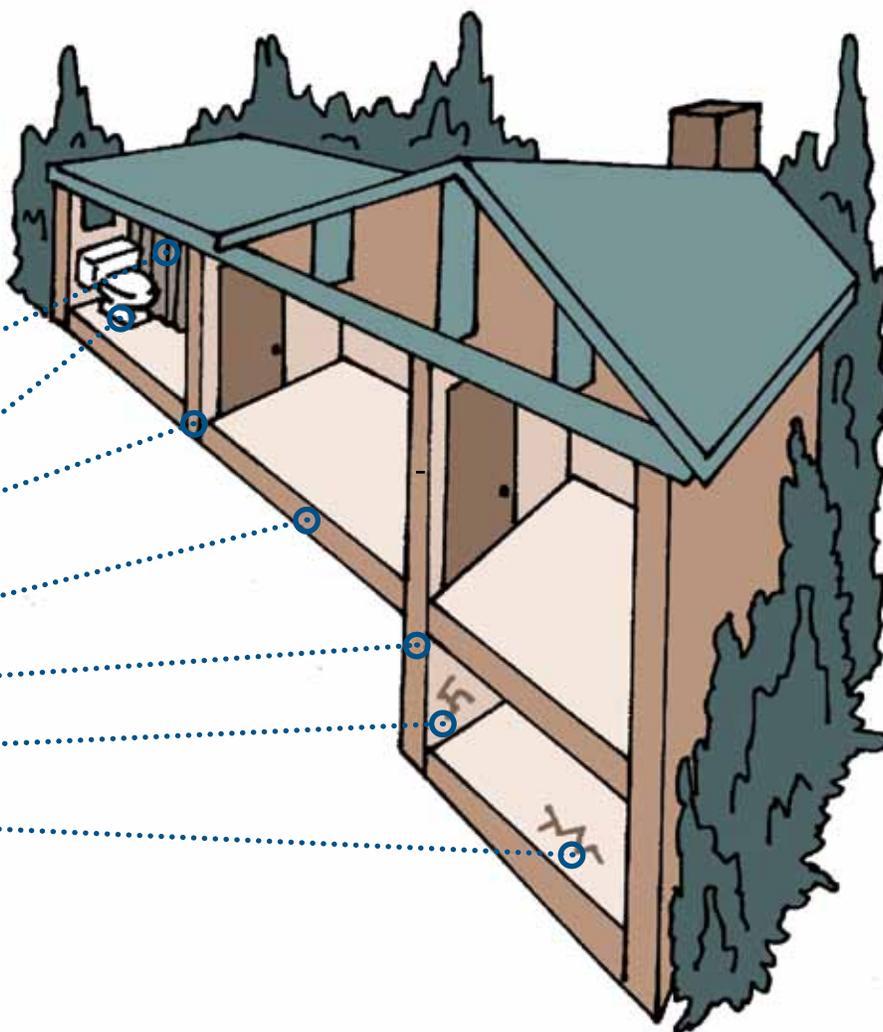


### WHERE IS RADON FOUND?

- Radon is found outside and indoors.
- Outdoor levels are typically well below the EPA's recommended action level of 4 pCi/L.
- Radon can enter any type of building - homes, offices, and schools - through cracks in the basement or foundation.<sup>3</sup>
- The majority of radon exposure occurs in homes where people spend most of their time.

### RADON GETS IN THROUGH:

- The water supply
- Gaps around service pipes
- Construction joints
- Gaps in suspended floors
- Cavities inside walls
- Cracks in walls
- Cracks in solid floors



## WHERE IS RADON FOUND?

### RADON LEVELS IN KENTUCKY

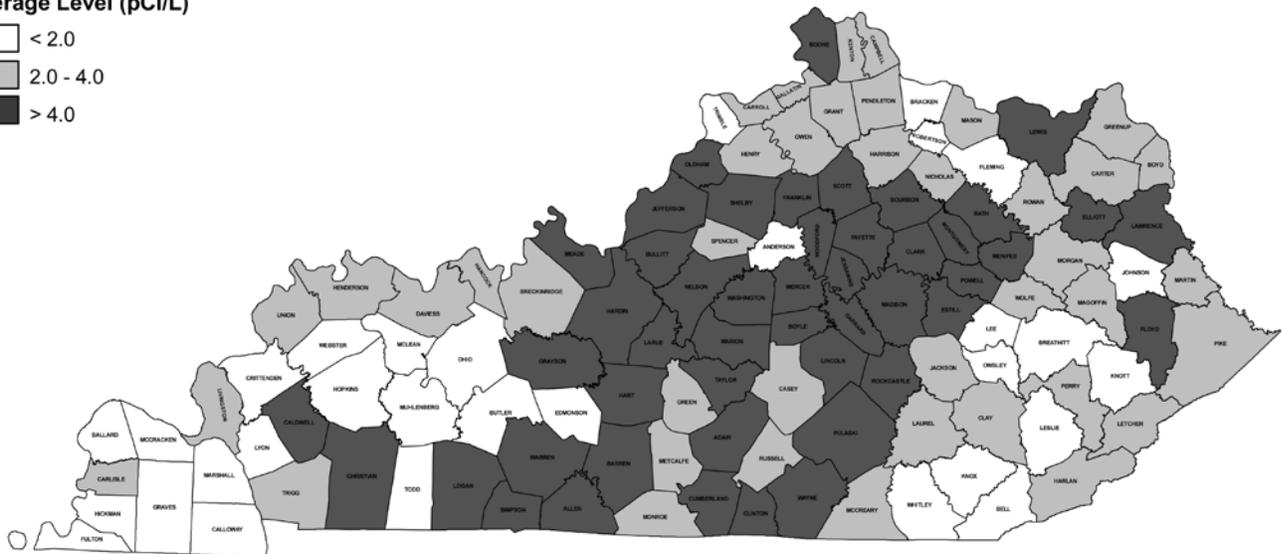
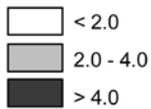
The map shows the average radon levels from radon test kits collected in each Kentucky county. Dark gray indicates a high risk for a potential radon problem. Light gray indicates a moderate risk for a potential radon problem. White indicates a low risk for a potential radon problem.

There is no guarantee that your home radon levels are similar to the average for your county. Residents should test their homes to determine if they have a radon problem, no matter the level of risk in the county. Homes should be mitigated if they test at 4 pCi/L or higher.<sup>3</sup>



### AVERAGE RADON LEVELS BY COUNTY, KENTUCKY

#### Average Level (pCi/L)



#### Notes:

The amount of radon in the air is measured in "picocuries per liter of air" or "pCi/L". The risk of contracting lung cancer from radon depends on how much radon is in your home, the amount of time you spend in your home, and whether you are a smoker or have ever smoked. The EPA recommends to take action to reduce radon in your home if the level is 4 pCi/L or higher. Even radon levels below 4 pCi/L pose some risk because there is no safe level of radon.

Source: EPA, "A Citizen's Guide to Radon", January 2009

Source of Radon Data: Kentucky Radon Program, 1998-2008

Source of GIS Data Layers: Kentucky Geological Survey

GIS Completed by WKU Department of Environment, Health and Safety



## RADON TESTING AND MITIGATION: A WAY TO PROTECT HEALTH



### A NOTE ON SHORT-TERM OR LONG-TERM TESTING:<sup>3</sup>

There are two general ways to test for radon. Short-term testing lasts two (2) to ninety (90) days, depending on the device. Charcoal canisters, continuous radon monitors, and liquid scintillation are the most common short-term testing devices. Long-term testing lasts for more than ninety (90) days. Alpha track and electrets detectors are the most common long-term testing devices. Because radon levels tend to vary from day to day and season to season, a short-term test is less likely than a long-term test to yield a year-round average radon level.

#### EPA RECOMMENDS THE FOLLOWING:

1. Conduct a short-term test. If the result is equal to or greater than 4.0 pCi/L, conduct a follow-up test.
2. For the follow-up test, use either a long-term test or a second short-term test. For better understanding of the annual average, use long-term testing. If the first short-term test result is more than twice EPA's 4.0 pCi/L action level, a second short-term test should be conducted immediately.
3. If a follow-up short-term test is conducted, average the results of both short-term tests. If the results are equal to or greater than 4.0 pCi/L, EPA recommends mitigation. If a long-term test was conducted as follow-up and the results are equal to or greater than 4.0 pCi/L, EPA recommends mitigation.

### WHY SHOULD HOMES AND OTHER BUILDINGS BE TESTED FOR RADON?

- Testing homes is cost-effective and easy.<sup>3</sup>
- Schools and offices may also contain radon, and need to be tested.
- The 1988 Indoor Radon Abatement Act requires testing of schools and federal buildings, but such testing rarely takes place.<sup>10</sup>

### HOW DO I KNOW IF I HAVE A RADON PROBLEM?

- The only way to know whether your home has high radon exposure levels is to test your home.
- The EPA recommends homes be fixed if the radon level is 4 pico curies per liter of air (pCi/L) or higher.
- Because there is no known safe level of exposure to radon, the EPA recommends that Americans consider fixing their homes for radon levels between 2.0 pCi/L and 4.0 pCi/L.<sup>3</sup>

### WHO PROVIDES RADON INFORMATION AND TESTING/MITIGATION?

- Many local health departments have radon programs and provide free radon test kits.<sup>3</sup> Find the list of county radon coordinators at <http://chfs.ky.gov/dph/info/phps/Radon+County+Information.htm>.
- The Kentucky State Radon program offers free radon test kits if there is not a county radon program: <http://chfs.ky.gov/dph/info/phps/radongas.htm> or (502) 564-4856.
- Radon test kits can be purchased at local home improvement stores for \$15-\$25.
- Radon testing and mitigating requires technical knowledge and special skills. It is recommended that only certified mitigation professionals test and mitigate for radon.<sup>3</sup> Visit <http://www.radongas.org> for a list of certified testers/mitigators.

**Note:** Kentucky has a state law requiring radon professionals to be certified, but as of December 2009, there were no regulations to guide the certification process.

### CAN RADON BE PREVENTED WHEN BUILDING A NEW HOME?

- Yes. Home builders can help prevent radon exposure before it starts by adding a Radon Resistant New Construction (RRNC) passive system during construction. This system can be easily activated by a certified mitigator if high radon levels are found in the home.
- RRNC costs approximately \$600-\$800 for a single family home, compared to \$1,200 to \$2,500 for mitigation of an existing home.

### WHY HIRE A CERTIFIED RADON PROFESSIONAL?

- A typical handyman cannot properly install a radon mitigation system.
- A certified radon professional can advise you on which radon reduction system is appropriate for your home or building.
- EPA recommends selecting a contractor who is nationally certified to test and mitigate for radon.
- Many states have training programs to certify radon professionals.
- There are national certification programs that follow established EPA protocols.

## RADON TESTING AND MITIGATION: A WAY TO PROTECT HEALTH

### HOW TO CHOOSE THE RIGHT RADON PROFESSIONAL?

- Ask for references
- Require proof of certification, including agreement to follow protocols and codes of ethics
- Ask for proof of insurance including workers' compensation
- Ask for a concise contract



Kentucky resident, Chuck Grone, of Villa Hills, KY, has been through the process of radon testing and mitigation. As a respiratory therapist and asthma sufferer, he understands the importance of lung health. When his home tested at a level higher than 4 pCi/L, he knew he needed to have his home mitigated. He hired a radon professional to install the system pictured here. He will continue to ensure that his mitigation system is working properly by re-testing his home.



## RADON: PUBLIC HEALTH RESPONSES TO FREQUENTLY ASKED QUESTIONS



### WHAT DOES THE OPPOSITION SAY ABOUT RADON?

There are groups who work against state radon regulations and policies. They support maintaining statewide preemption so that local communities do not have the option to propose and implement radon safety measures. By proposing weak, ineffective or no radon policies, opponents perpetuate the myth that radon is not really harmful and they argue that no more needs to be done to reduce the harms from radon.

### ARE SCIENTISTS SURE THAT RADON IS A REAL HEALTH PROBLEM?

**PUBLIC HEALTH RESPONSE:** Yes. The debate is over. All major health organizations (e.g., U.S. Surgeon General, Centers for Disease Control and Prevention, World Health Organization, EPA, American Lung Association, and American Medical Association) agree that radon causes thousands of preventable lung cancer deaths every year. The EPA estimates that approximately 2,900 radon-induced, lung cancer deaths occur each year among never-smokers.

### HOW DO I KNOW IF I HAVE A RADON PROBLEM?

**PUBLIC HEALTH RESPONSE:** Radon testing is easy and reliable. You can test your home yourself or hire a qualified radon test company. Either approach is easy and quick. Free radon test kits are available through the state radon program or your local health department. You can also buy a test kit at hardware or home improvement stores for \$15-\$25 or hire a qualified radon testing professional for about \$100.

### CAN HOMES WITH RADON PROBLEMS BE FIXED?

**PUBLIC HEALTH RESPONSE:** Yes. There are simple, easy solutions to radon. Hundreds of thousands of homeowners have already fixed radon in their homes. Radon levels can be readily lowered for \$1,200 to \$2,500. It costs only \$600-800 to fix the problem before it starts by building with radon resistant construction materials.

### DOES RADON ONLY AFFECT CERTAIN KINDS OF HOMES, WORKPLACES, AND SCHOOLS?

**PUBLIC HEALTH RESPONSE:** No. Radon can be a problem in homes of all types: old homes, new homes, drafty homes, insulated homes, homes with basements, and homes without basements. Local geology, construction materials, and how the home or building was constructed can affect radon levels.

### IS RADON ONLY A PROBLEM IN CERTAIN PARTS OF THE COUNTRY?

**PUBLIC HEALTH RESPONSE:** No. High radon levels are found in every state. While radon problems vary from area to area, the only way to know your radon level is to test.

## RADON: PUBLIC HEALTH RESPONSES TO FREQUENTLY ASKED QUESTIONS

### IS A NEIGHBOR'S TEST RESULT A GOOD INDICATION OF WHETHER YOUR HOME HAS A PROBLEM?

**PUBLIC HEALTH RESPONSE:** No. A neighbor's test result is not a good indication of whether your home has radon. Radon levels can vary greatly from home to home. The only way to know if your home has a radon problem is to test.

### SHOULD EVERYONE TEST THEIR WATER FOR RADON?

**PUBLIC HEALTH RESPONSE:** No. It is important to first test the air in the home for radon. Radon can enter the home through water. If your water comes from a public water supply that uses ground water, call your water supplier. If high radon levels are found in the home and there is a private well, call the Safe Drinking Water Hotline at 1 800-426-4791 for information on testing your water.

### IS RADON FOUND IN GRANITE?

**PUBLIC HEALTH RESPONSE:** Some types of granite may emit gamma radiation above typical background levels. However, at this time EPA believes that the existing data is insufficient to conclude that the types of granite commonly used in countertops result in significantly increased indoor radon levels. The principal source of radon in homes is from the soil in contact with basement floors and walls. To reduce the radon risk, you should first test the air in your home.

### IS IT DIFFICULT TO SELL A HOME WHEN IT HAS TESTED HIGH FOR RADON?

**PUBLIC HEALTH RESPONSE:** When radon problems are fixed, home sales are not affected. The added protection of mitigation may be a selling point. Kentucky law requires the seller to disclose if the home has ever been tested for radon.

### IS IT TOO LATE TO TAKE ACTION SINCE I'VE LIVED IN MY HOME AND WORKED IN MY WORKPLACE FOR SO LONG?

**PUBLIC HEALTH RESPONSE:** It is never too late to test for radon! You will reduce your risk of lung cancer when you reduce radon levels, even if you've lived with a radon problem for a long time.

### CAN A SHORT-TERM TEST BE USED FOR MAKING A DECISION ABOUT WHETHER TO FIX YOUR HOME?

**PUBLIC HEALTH RESPONSE:** A short-term test, followed by a second short-term test can be used to decide whether to fix your home. When using a short-term test, it is necessary to follow the directions carefully. For example, if you conduct a short-term test while your windows are open, you will not get accurate results. Long-term tests are also available and give an accurate read of radon levels in your home throughout a 9-12 month period.



Reliable testing devices are available for free by calling your local health department or the Kentucky State Radon Program.

Call 502-564-4856 or visit <http://chfs.ky.gov/dph/info/phps/radongas.htm> for testing and mitigation resources. For help finding qualified testing and mitigation services in your area visit <http://www.radongas.org>.

You may contact the Northern Kentucky Radon Coalition for more information by visiting <http://www.nkyradon.org>.

## RADON POLICY



### WHAT ARE THE MOST COMMON RADON LAWS?

- Mandatory testing of schools and daycares
- Mandatory radon disclosure at all real estate transactions
- Required certification for mitigators
- Mandatory use of Radon Resistant New Construction

### FEDERAL LAWS

#### The Federal Radon Abatement Act of 1988 Authorized Funds for:

- state radon programs
- technical assistance from the EPA
- school testing and research
- training for radon professionals
- model construction guidelines to be developed by the EPA
- federal building testing and research
- educational information to be developed by the EPA

#### Stewart B. McKinney Homeless Assistance Act

Under the 1988 Stewart B. McKinney Homeless Assistance Act, the U.S. Department of Housing and Urban Development (HUD) is required to develop a policy for dealing with radon contamination that utilizes EPA guidelines and standards to ensure that occupants of HUD housing are not exposed to hazardous levels of radon. The law is largely ignored.



U.S. Environmental Protection Agency, Washington, DC

## RADON POLICY

### KENTUCKY STATE LAWS

Kentucky has only a few state laws related to radon. Kentucky requires that all mitigators obtain certification under K.R.S. 211.855-856; however, the Cabinet for Health and Family Services has not yet adopted regulations needed to implement the law. Also, Kentucky requires that radon testing be disclosed at the point of sale of single family residential real estate if radon testing has occurred anytime in the past (K.R.S. 324.360). The law does not require radon testing to take place at point of sale; rather if radon testing has occurred in the past, it must be disclosed to the buyer.

- **K.R.S. 211.855-856** requires radon mitigators to be certified through the Cabinet for Health and Family Services. While this state law exists, there are no regulations in place to enforce the law. There is a national certification process and registered mitigators in Kentucky who are nationally certified can be found at <http://www.radongas.org>.<sup>11</sup>
- **K.R.S. 324.360**, under 201 Kentucky Administrative Rules 11:350 requires home radon testing to be disclosed in real estate transactions if the home has been tested in the past. If the home has not been tested in the past, there is no regulation requiring the current owner to test the home before selling it.<sup>12</sup>

### LOCAL CONTROL

Kentucky regulations preempt local governments from adopting more stringent building codes. Currently, for example, a local government could not require builders to use Radon Resistant New Construction (RRNC); rather, action would be required at the state level. In 2010, the state building code will be reviewed.



“When we moved to Kentucky, we realized that radon levels could be high. But when several of us in the neighborhood discovered high levels of radon in our own homes, we were concerned about how to remove it. We organized a neighborhood meeting and invited the health department to help us figure out next steps. We were so relieved to learn that radon testing was simple, and the radon testing kits were offered at no cost from the health department. Mitigation ensured healthy air in our homes; a great long-term investment.”

*Pat Burkhart*

## **RADON LAWS IN THE UNITED STATES**



### **RADON TESTING**

Requires seller to disclose if property has been tested for radon or has a known radon hazard. Many state laws enable agencies to develop appropriate regulations and forms to implement this requirement.

AK, CA, CO, CT, DE, DC, IL, IN, IA, KY, ME, MD, MI, MS, MT, NE, NH, NJ, NY, NC, OH, OK, OR, PA, SC, SD, TN, TX, WA, WI

Requires that registered radon testers notify their state radon programs of test results.

ME, NY

Authorizes the Department of Health to provide, upon request, laboratory services for voluntary testing of indoor air pollutants including radon.

RI

Regulations adopted under the law require certain schools at certain times to test for radon. Some require mitigation of high radon levels.

CO, CT, FL, MN, NJ, NY, OH, RI, VA, WV

Requires child day care centers to test for radon.

CT, FL, ID, IA, MD, MI, NJ, RI

Requires group day care homes to test for radon.

CT, ID, MI

Conducts a variety of programs to test residential property and reduce exposure through regulation, warnings, advisory boards, and mitigation.

DE, DC, FL, ME, NH, NJ, NY, OH, PA, RI, WV, WI

### **RADON MITIGATION**

Establishes that no person may provide radon services unless that person is certified (nationally and/or state certified). Some states are required to keep a list of certified mitigators.

CA, CT, DC, FL, IL, IN, IA, KY, ME, MD, MT, NE, NJ, NY, OH, PA, RI, VA, WV

Provides for confidentiality of test results. Authorizes the department to perform periodic inspections of the validity of measurements and the adequacy of abatement measures performed by certified and credentialed persons.

IA

### **RADON RESISTANT NEW CONSTRUCTION**

Adopts standard for radon-resistant new construction. Provides that municipalities electing to adopt a radon-resistant new construction standard must use the state model standard.

CA, FL, ME, MI, MN, NJ, RI, WA

## **RADON LAWS IN THE UNITED STATES**

### **PUBLIC EDUCATION**

Requires the state to prepare a public education/awareness program or document related to radon.

CA, FL, GA, IL, ME, MA, MT, NH, NJ, OR, , WI

### **HOMEBUILDERS: DISCLOSURES, TAX CREDITS, LIABILITY**

Requires home builders to complete a disclaimer or disclosure regarding environmental hazards present on the home site including radon.

MD

Establishes a green building tax credit program that includes radon.

NY

Establishes a defense in a civil lawsuit brought against a builder for damages for injury caused by indoor air pollutants in a residential structure. Defense applies if builder complied in good faith with: building product safety standards, including labeling; restrictions on use of building materials known or believed to contain substances that contribute to indoor air pollution; and ventilation and radon-resistant construction requirements contained in state law.

WA

### **CIVIL AND CRIMINAL RAMIFICATIONS FOR MISREPRESENTING RADON READINGS**

Provides that it is a deceptive trade practice to knowingly make a false representation as to the results of a radon test or the need for radon mitigation.

CO

Limits liability of licensed real estate brokers or salespersons for communicating false, misleading or deceptive information, where the licensee had no actual knowledge of the information, and made a diligent effort (e.g., obtained a property disclosure report from seller) to ascertain whether the information was false or misleading.

NJ

Provides that it is a misdemeanor to misrepresent the capabilities of a device for detecting and measuring radon or radon progeny.

IL

### **RADON AND WATER**

Requires adoption of regulations establishing safe levels of radon in potable water.

CT



## RADON: WHAT BUILDERS NEED TO KNOW



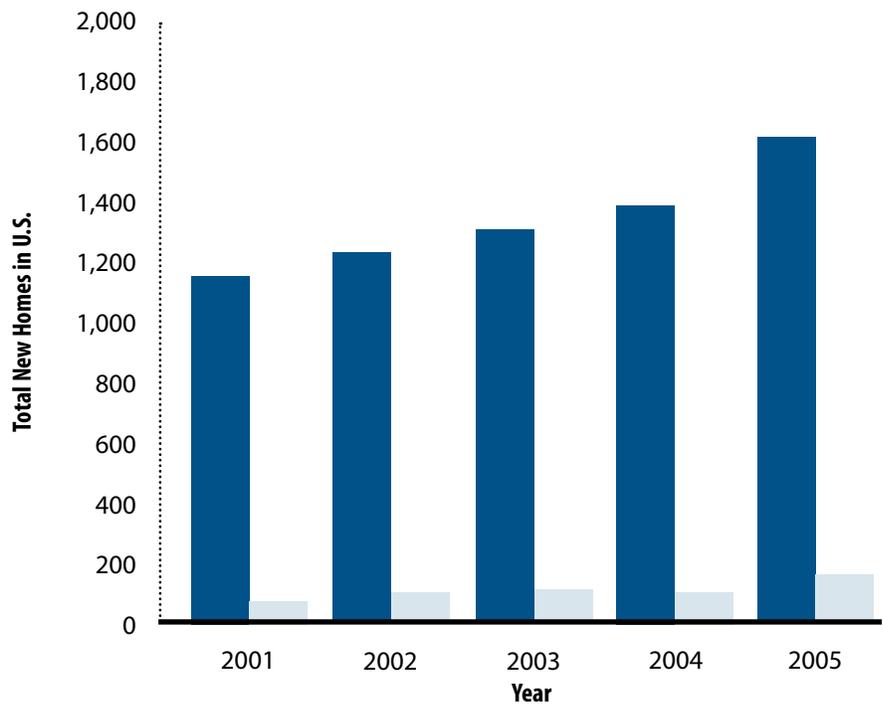
### RADON RESISTANT NEW CONSTRUCTION (RRNC)

Radon-Resistant New Construction (RRNC) is a set of construction techniques consistent with state-of-the-art energy efficient 'green' construction practices, allowing for lower energy consumption and increased savings. Using these techniques can decrease the radon level of a home by up to 50%. Of an estimated 6.7 million new homes built between 2001 and 2005, only 469,000 incorporated radon-resistant building techniques. Only 7% of the approximately 15,000 total residential housing units constructed in Kentucky in 2007 were built using RRNC techniques.<sup>13</sup>

### BENEFITS OF RRNC

- Lower radon levels by as much as 50%.
- More aesthetically appealing, compared to retrofit system on an existing home.
- Cost-effective, averaging \$600 to \$800 per system. The average cost of a RRNC system over the life of a 30-year mortgage is less than \$3 per month.
- Converting a passive vent system to an active (fan-powered) system is easy and cost-effective, averaging between \$500 to \$600 per activation.

**NOTE:** Failure to address the lack of RRNC implementation by builders on a national level adds approximately 436,000 new homes with elevated radon levels each year.<sup>13</sup>

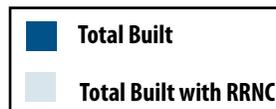


#### ESTIMATED KENTUCKY HOMES WITH ELEVATED RADON LEVELS NOT YET MITIGATED IN 2007<sup>14</sup>

**6550** (homes w/ elevated radon levels)

**-1500** (homes mitigated)

**5050** (homes remaining with elevated radon levels)

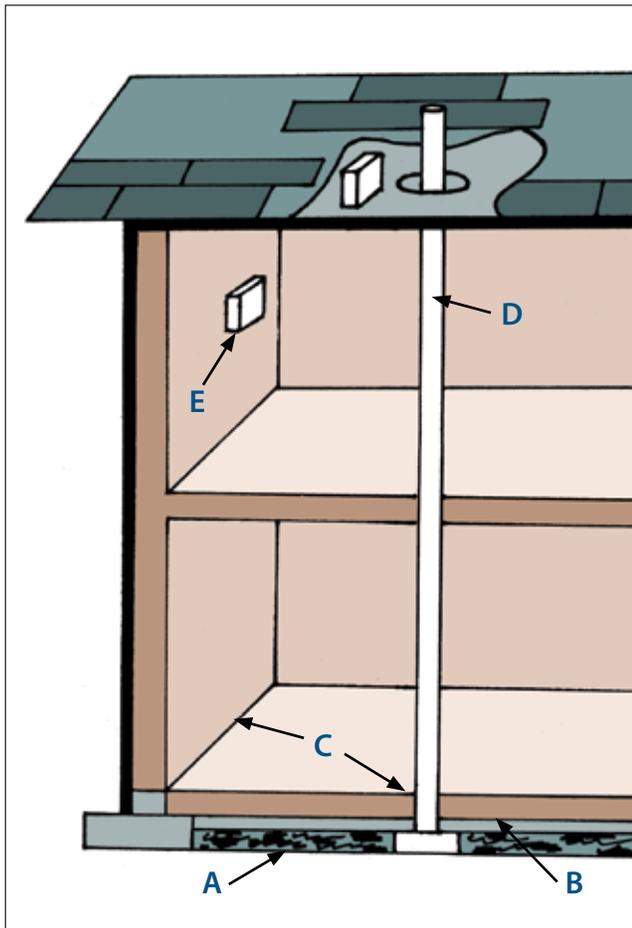


## RADON: WHAT BUILDERS NEED TO KNOW

### RADON AND ENERGY EFFICIENCY

Radon Resistant New Construction (RRNC) increases energy efficiency by reducing moisture and the potential for mold. Moisture control increases the energy efficiency of home heating and air systems.

Radon mitigation involves sealing all cracks in the basement, crawlspace or slab foundation, and reducing air exchange between inside and outdoor air. Keeping air inside reduces the demand for continued heating or cooling, thereby increasing energy efficiency.



#### A. GAS PERMEABLE LAYER

A 4-inch layer of clean gravel is placed beneath the slab or flooring system. This allows the soil gas to move freely under the house. It is used in homes with casement and slab-on-grade foundations but not in crawlspace foundations.

#### B. PLASTIC SHEETING

Sealed plastic sheeting placed on top of the gas permeable layer and under the slab helps prevent soil gas from entering the home. Plastic sheeting is also used in crawlspaces.

#### C. SEALING AND CAULKING

Sealing all openings in the concrete foundation reduces soil gas entry into the home.

#### D. VENT PIPE

The vent pipe, usually a 3-4 inch PVC pipe runs from the gas permeable layer through the house and above the roofline which allows for safe venting of radon above the house.

#### E. JUNCTION BOX

An electrical junction box makes wiring and installation of a vent fan easier. If a radon test shows elevated radon levels (4 pCi/L or higher), a passive system can be easily activated if a separate junction box is already available to power the vent fan.<sup>15</sup>

## **RADON: WHAT REALTORS NEED TO KNOW**



### **KENTUCKY REAL ESTATE LAWS AND REGULATIONS**

There are no Kentucky statutes that require radon testing in the transaction or sale of residential real estate. If radon testing occurred any time in the past, this must be included on the seller's disclosure form according to K.R.S. 324.360.

### **KENTUCKY RADON LAWS AND REGULATIONS**

Under Kentucky law K.R.S. 211.856, the Cabinet for Health and Family Services is the agency that should promulgate administrative regulations for the certification of radon laboratories, radon mitigation, and radon measurement. Presently, there are no administrative regulations in place that can be enforced.

### **WHY RADON CONSIDERATIONS SHOULD BE STANDARD REALTOR PRACTICE**

#### **RADON TESTING IS EASY**

Call the State Radon Program at 502-564-4856 or <http://chfs.ky.gov/dph/info/phps/radongas.htm> for help in identifying radon testing suppliers or visit <http://www.radongas.org> to obtain information on qualified testers.

#### **RETAINING CLIENTELE**

A Realtor who puts the health of the customer first retains clientele. Radon mitigation systems can be a selling point as they reduce the risk for radon exposure, increase energy efficiency and improve healthy living.

#### **PROTECTING THE SELLER FROM LIABILITY**

A realtor who covers all details in the selling process including radon testing and disclosure reduces the potential for litigation.

#### **FIXING RADON PROBLEMS IS EASY**

Even if a home tests high for radon, it can be easily fixed. Standard remediation measures are tested and reliable.



## SUMMARY

Radon is a naturally occurring radioactive soil gas that is colorless, odorless and tasteless. Higher concentrations of radon are found in indoor spaces such as homes, offices, and schools, entering through cracks in the basement or foundation.

Radon is the second leading cause of lung cancer in the United States. The combination of radon and tobacco smoke particles makes it easier to breathe in radioactive particles and easier for those particles to stick to the lungs, increasing the risk for lung cancer.

The only way to reduce radon exposure is to test homes and workplaces for radon. If levels are at or above 4 pCi/L, the EPA recommends mitigating the structure. Mitigation entails sealing cracks in basements and crawlspaces followed by constructing a system which vacuums radon particles out from the space and releases them into the outdoor environment where they are diluted into harmless levels. Radon resistant new construction is a cost-effective and aesthetically pleasing alternative to preventing radon exposure. Education and policy change can limit exposure to radon, reducing the risk for lung cancer among smokers and nonsmokers.



### Healthy People 2010

Healthy People 2010 is a nationwide health promotion initiative grounded in science and designed to promote health and prevent illness, disability, and premature death.<sup>16</sup>

#### HEALTHY PEOPLE 2010 AIMS TO:

- Increase the proportion of people who live in homes tested for radon concentrations. In 1998, only 17% of the population lived in homes that had been tested for radon.
- Increase the number of new homes constructed to be radon resistant. In 1997, only 1.4 million homes had been constructed using Radon Resistant New Construction.

#### KENTUCKY PLANS TO:<sup>17</sup>

- Increase access to radon information for Kentucky citizens.
- Identify more schools for testing.
- Request that the State Board of Education use radon resistant new construction in new schools.
- Collaborate with real estate firms to test for radon early in the selling process.
- Advocate for dispensing radon information as part of the property transfer process.

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