

**RADON IN RENTAL HOUSING:
LEGAL AND POLICY STRATEGIES
FOR REDUCING HEALTH RISKS**

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EXECUTIVE SUMMARY

Background

During the past several years, there has been considerable attention focused on the problem of radon, a colorless, odorless and tasteless gas produced by the decay of uranium. Radon is found in homes and buildings throughout the United States, and enters the body mainly through inhalation, thereby damaging cells in the lung. The U.S. Environmental Protection Agency (EPA) has designated radon a Class A carcinogen, and estimates that radon exposure is associated with between 7,000 and 30,000 cancer deaths each year.

The radon outreach and education programs of EPA, state and local government agencies, and private organizations have helped to increase greatly public awareness of this environmental health hazard. In the residential context, this work has focused almost exclusively on promoting radon testing and mitigation in single family, owner-occupied homes. There have been few, if any, initiatives targeted at reducing exposure to high radon levels in rental housing.

This absence is notable, given that rental units comprise a considerable portion of the homes in the United States -- over one-third of all housing units in the country in 1989. In that year, 34 million units, or 36 percent of all occupied units, were occupied by renters. Moreover, there are indications that rental housing is increasing at a greater rate than owner-occupied housing; of the total increase in households during the 1980's, rental households increased by 17 percent, as compared to 10 percent for owner-occupied households.

Rental properties are different from owner-occupied properties in ways that create challenges for developing radon risk reduction programs. In addition to the physical differences between larger multifamily rental buildings and single family homes, there are significant legal and financial differences in the status of tenants and home owners. In the rental housing context, the individuals exposed to radon are not those with the legal or financial control to undertake radon mitigation on the premises. Questions of control aside, tenants may feel that they do not have a sufficient economic stake in the property to undertake radon mitigation, or that they will not reside in the property long enough to warrant undertaking radon mitigation. In addition, renters are more likely to lack the financial means to undertake mitigation. In 1989, median household income was 84 percent higher for owners than renters -- \$33,300 for owners compared to \$18,100 for renters. Therefore, many tenants simply cannot afford the cost of radon mitigation, even if they have the authority to mitigate and the interest in doing so.

Radon risk reduction strategies that do not focus on rental housing directly, and do not address the key differences between rental and owner-occupied dwellings, will likely fail to reduce significantly exposure to high radon levels in rental buildings.

To address this problem, policy makers should take a two-pronged approach: the adoption of legal requirements relating to radon in rental housing, and the development of

programs to help fund radon testing and mitigation in rental housing that is home to lower income families. Although legal requirements for radon testing, disclosure and mitigation in rental housing will impose costs on the private and public sectors, the evidence to date of lives lost each year to radon-related lung cancer presents compelling grounds for taking action to ensure that tenants are not exposed to high radon levels in the homes they lease. Nevertheless, such measures cannot be relied on exclusively. That segment of the rental housing stock that is financially marginal -- i.e., properties that generally house lower income residents -- may be unable to support the costs of compliance with radon-related requirements. Therefore, programs to help finance the cost of mitigating unacceptable radon levels are crucial to pursuing the goal of radon risk reduction while preserving affordable housing.

Legal Requirements for Radon Testing, Disclosure and Mitigation in Rental Housing

1. *Liability for Damages Resulting from Housing Conditions.* Potential tort liability does not currently influence significantly radon testing and mitigation decisions in rental property. Potential tort liability can be clarified through legislation that addresses the duty of landlords with respect to radon testing and mitigation. However, tort litigation should not be relied on as the primary vehicle for implementing a landlord's duty to address high radon levels.

2. *Radon Disclosure, Testing and Mitigation in the Transfer or Sale of Rental Properties.* Because prospective purchasers of rental properties will be concerned with the condition of the property, particularly to the extent that the condition may lead to liability on the part of the purchaser, mitigation of high levels is more likely to occur if actual radon levels are disclosed. Although mandatory testing alone may trigger remediation in many cases, the potential health risks to third parties (tenants) present strong policy justifications for making mitigation of high levels mandatory in connection with the transfer of rental properties. Moreover, this approach takes advantage of the real estate transaction as an opportunity for negotiating the costs of radon testing and mitigation.

3. *Radon Disclosure, Testing and Mitigation in the Landlord-Tenant Relationship.* Existing landlord-tenant doctrines and laws that address tenant safety and health do not explicitly refer to radon problems in rental housing. These doctrines should be expanded to include protection from exposure to high radon levels. Disclosure of radon levels presents an opportunity for educating tenants and for assisting tenants in ensuring that landlords comply with their obligations regarding radon in the property.

In addition to disclosure, states can require owners to ensure that rental units contain acceptable levels of radon, as defined by the state. Existing legal doctrines such as the implied warranty of habitability, which has been adopted in many states, provide a vehicle for tenants to seek radon mitigation by the landlord. Legislation to clarify the landlord's duty to ensure acceptable radon levels in rental property represents another important means of promoting radon risk reduction. Such legislation might create an independent statutory duty to reduce unacceptable radon levels; amend an existing statute requiring landlords to repair unsafe conditions; or amend an existing housing code.

4. *Building Codes Applicable to Rental Housing Construction.* Radon-resistant new construction techniques can help *prevent* the problem of high radon levels in new rental housing. To effectively address new rental housing construction, EPA can continue to encourage, and state and local governments can adopt, radon-resistant new construction code provisions. These efforts should be expanded to develop and promote radon-resistant techniques that are applicable to multistory structures, which contain a substantial number of rental housing units. The use of radon-resistant features could be required as a condition of receiving federal or state assistance for the construction of new rental housing.

Programs Addressing the Cost of Radon Mitigation in Rental Housing

Creating programs to ease the financial burden of radon reduction in affordable rental housing requires not only establishing radon reduction in rental housing as a priority, but also creating mechanisms to fund such a program. At a time of shrinking budgets and program cutbacks, targeted funding for a radon reduction assistance program is critical.

1. *Grants and Loans for Radon Risk Reduction.* Federal and state legislatures could provide loans with interest subsidies or grants for radon testing and mitigation through a variety of mechanisms, including: a) creation of a new federal grants program; b) creation of a new state radon assistance program, which might be funded in part through federal radon program grants to the states; or c) application of related funding programs -- such as the federal Community Development Block Grant (CDBG) and HOME programs or existing state programs -- to radon risk reduction activities.

2. *Tax Credits.* Tax credits could be provided to owners who undertake radon mitigation, covering a certain dollar amount or a specified percentage of the costs incurred. Such credits could also be provided to radon professionals who demonstrate that they have provided free radon mitigation services to low income properties.

3. *Direct Assistance.* Some states and local jurisdictions have carried out programs to provide residents with free or low cost radon testing devices. Similarly, states could set up programs to provide radon mitigation services directly to rental dwellings. Such a program might be based on the current federal Weatherization Assistance Program, through which states have established programs for providing weatherization services. A radon mitigation program could be modeled on, or could be combined with, the weatherization program. A key to the success of such an effort, however, is adequate additional funding for radon mitigation services.

4. *Facilitating "Self-Help" Radon Mitigation.* Because some owners are accustomed to undertaking property repairs themselves, states might design a program to assist those owners interested in doing so. This type of program might facilitate radon mitigation in properties that could not support the cost of commercial radon services. It is critical to any such initiative, however, that owners be required to undergo training that emphasizes the potential safety concerns associated with radon mitigation work. States might consider a special certification course for those who wish to do radon mitigation only on property they own.

RADON IN RENTAL HOUSING: LEGAL AND POLICY STRATEGIES FOR REDUCING HEALTH RISKS

During the past several years, a significant amount of public and private resources has been devoted to studying the health effects of radon, a colorless, odorless and tasteless gas found in homes and buildings throughout the United States. Radon is believed to be a leading cause of lung cancer and has been designated a Class A carcinogen by the United States Environmental Protection Agency (EPA).¹ In addition to its research, EPA has conducted a large-scale public education campaign. This effort has generally sought to encourage home owners to test their homes for radon and to reduce high radon levels where necessary. EPA's recent *Home Buyers' and Sellers' Guide to Radon* specifically promotes radon testing during the home purchase and sale transaction. Other EPA publications, such as *A Citizen's Guide to Radon* and the *Consumer's Guide to Radon*, are more generally geared to those who own their own home.

By contrast, little has been done to address directly the problem of radon hazards in rental housing. Rental units comprised over one-third of all housing units in the country in 1989. In that year, 34 million units, or 36 percent of all occupied units, were occupied by renters.² While fewer in number than owner-occupied homes, rental units are different in ways that create challenges for developing radon reduction programs. In addition to the physical differences between some multifamily rental buildings and single family homes, there are significant legal and financial differences in the status of tenants and home owners. Radon initiatives that fail to take these differences into account will likely fail to succeed in reducing exposure to high radon levels in rental housing.

This paper reviews existing legal and policy tools for reducing radon risks and suggests strategies for facilitating radon testing and mitigation of high radon levels in rental housing. It will not address the distinct legal and regulatory mechanisms for addressing radon in government owned and subsidized housing. Although the problem of radon in those properties is no less important, its analysis is beyond the scope of this paper.³

¹ In order to be labelled a Group A carcinogen for humans, there must be sufficient epidemiological evidence from human studies that the substance causes cancer. A. Schmidt, *et al.*, U.S. EPA Office of Radiation Programs, [EPA's Approach to Assessment of Radon Risk](#) (1990).

² U.S. Bureau of the Census, [Housing in America](#) 2 (1992).

³ The question of radon in federally subsidized housing is addressed in the Stewart B. McKinney Homeless Assistance Amendments Act of 1988, which requires the Department of Housing and Urban Development (HUD) to "develop an effective departmental policy for dealing with radon contamination...to ensure that occupants of [specified housing owned or assisted by HUD] are not exposed to hazardous levels of radon...." The Act also requires HUD to work with EPA to reduce radon contamination; the agencies currently have a Memorandum of Understanding to coordinate a pilot program for testing and mitigation in HUD-owned and subsidized properties. HUD-DU1001920000053.

The paper begins with some background on the problem of radon in rental housing. Section I describes what radon is, how federal and state governments have approached the problem thus far, and why its presence in rental housing units creates unique policy issues that require action. The remainder of the paper describes two general components of an effective program for reducing radon in rental housing. First, legal requirements should be established for reducing unacceptable radon levels in rental units. Section II explores specific areas of law that provide vehicles for establishing such requirements, and suggests that states should utilize these areas of the law to craft requirements for radon disclosure, testing and mitigation. Second, governmental programs should be designed to make public sector resources available to help carry out radon reduction in rental housing occupied by lower income families. Section III thus focuses on the problem of preserving affordable housing while establishing requirements for acceptable radon levels in rental housing. That section describes certain programs that address the cost of undertaking radon testing and mitigation in rental properties that are home to low and moderate income families. Ultimately, a successful program will incorporate prescriptive legal features as well as creative policy initiatives at the federal, state and local levels.

I. THE PROBLEM OF RADON EXPOSURE

A. *Background: The Radon Problem Generally*

Radon is a naturally occurring gas produced by the decay of uranium, which is present in most soil and rock, as well as in water. Radon enters the body chiefly through inhalation, damaging cells in the lungs.⁴ The federal government estimates that there are between 7,000 and 30,000 radon-related deaths each year, making radon the second leading cause of lung cancer deaths in the country after smoking.⁵

These threats to health come not from ambient levels of radon, but from high indoor concentrations of the gas. The most common way in which radon becomes concentrated indoors is through cracks or other openings in the basement slab, or through a crawlspace.⁶ Because the

⁴ See J. Samet, "Radon and Lung Cancer," 81 *Journal of the National Cancer Institute* 745-757 (May 22, 1989). As it decays, radon emits radioactive products, known as "radon progeny" or "radon daughters," which can cause mutations in cells and tissues. *Id.*

⁵ U.S. EPA, *The Technical Support Document for the 1992 Citizens Guide to Radon* (May, 1992). See also, Testimony of Margo T. Oge, Director of Office of Radiation and Indoor Air, U.S. EPA, before the Subcommittee on Health and the Environment, Committee on Energy and Commerce, U.S. House of Representatives (March 18, 1993); U.S. EPA, *Current ORP Estimates of Annual Radon-Induced Lung Cancer Deaths in the General Population*, (Memorandum from Margo Oge, Director of the Office of Radiation Programs) (Aug. 17, 1989). People who smoke and are exposed to radon are believed to be at even greater risk. *Id.*

⁶ G. Eichholz, "Human Exposure" in *Environmental Radon* (C. Cothorn & J. Smith, Jr., eds.) 160 (1987). Radon may be present in well water that has passed through uranium-rich soil; human exposure to radon can occur if the water is exposed to air -- e.g., during showers, use of washing machines or cooking -- or if the water is ingested. *Id.* at 166. Building materials, such as concrete blocks or bricks, that contain radioactive materials also may contribute to indoor radon levels. *Id.* at 172. Water and building materials, which are generally considered to be relatively minor sources of indoor radon compared to indoor air, are not discussed in this paper.

air pressure within buildings is lower than the pressure in the surrounding ground, buildings draw in radon from the soil and rock.⁷

Some areas of the United States are considered to possess a greater potential for high radon concentrations in soil. EPA and the U.S. Geological Survey recently developed a "Map of Radon Zones," which assigns a Zone 1, 2, or 3 designation to each county, based on predicted average indoor radon screening levels.⁸ However, generalizations about radon potential in different geographic regions cannot be used to determine whether a particular building in any part of the country contains high levels of radon. High indoor radon levels have been found throughout the country, and only testing of an individual structure can rule out the existence of a radon problem.⁹

Based on health studies and on the available techniques for reducing radon, EPA has established an "action level" of 4 picoCuries per liter of air (pCi/L) for reducing radon, although it notes that there is no level at which exposure to radon is harmless.¹⁰ While the average radon level in homes in the U.S. is 1.25 pCi/L, an estimated six million homes contain radon levels at or above EPA's action level.¹¹

B. Current Public Policy Strategies for Reducing Radon Hazards

The scope of EPA's radon program is defined by the Indoor Radon Abatement Act of 1988, as codified in the Toxic Substances Control Act (TSCA), which authorizes radon activities at the federal level.¹² One of the main elements of this program is public education and risk communication. Radon education programs have sought generally to achieve two ends -- to provide basic information about radon, and to encourage radon testing in the home.¹³ These

⁷ General Accounting Office, Air Pollution: Hazards of Indoor Radon Could Pose a National Health Problem 11 (1986). The amount of radon entering a home depends on, among other things, the amount of radium in the soil surrounding the house, the permeability of the soil, the type of house construction and the condition of the home's foundation. *Id.*

⁸ 58 Fed. Reg. 19097, 99 (April 12, 1993). Areas with greatest potential for high radon levels are designated as Zone 1, while those with the least potential are designated as Zone 3.

⁹ Radon screening surveys by EPA in 42 states and 7 Indian nations, as well as surveys by several states, have uncovered elevated radon levels in homes in every state, though the problem is more extensive in some states. Testimony of Margo Oge, *supra* note 5.

¹⁰ Environmental Protection Agency, A Citizen's Guide to Radon 7 (May 1992). The federal Indoor Radon Abatement Act provides a long term goal for radon levels; the law states that "air within buildings in the United States should be as free of radon as the ambient air outside of buildings." 15 U.S. C. §2661.

EPA's risk assessment is based on data involving miners. The epidemiological studies are inconsistent, however a recent Swedish study found that people exposed to radon levels between 3.8 and 10.8 pCi/L had a 30 percent higher lung cancer risk than those exposed to 1.4 pCi/L or lower. New England Journal of Medicine (January 20, 1994).

¹¹ Testimony of Margo T. Oge, *supra* note 5.

¹² 15 U.S.C. §§2661-2671. The statute describes five principal areas of activity: (1) development of model construction standards and techniques; (2) update of EPA's "Citizen's Guide"; (3) provision of technical and grant assistance to state radon programs; (4) study of radon in schools and in public buildings; and (5) funding of regional radon training centers.

As noted above, EPA is also required under the McKinney Act to work with HUD to develop standards for radon reduction in federally subsidized housing.

¹³ See, e.g., EPA's A Citizen's Guide to Radon, *supra* note 11. These twin purposes are also apparent in media campaigns sponsored by EPA, and in the agency's work with organizations such as the American Lung Association and the American Public

educational efforts have emphasized the potential hazards posed by radon, and the relative convenience and affordability of radon testing.¹⁴

In addition to utilizing public education and risk communication efforts, EPA has worked to provide an "infrastructure" for effective state and local radon reduction programs. The agency has done extensive research relating to the health effects of radon exposure and to appropriate techniques for radon testing and mitigation. It recently published model standards for radon-resistant new construction, designed to prevent high radon levels in new residential housing.¹⁵ In addition, EPA has established voluntary proficiency programs for radon professionals and radon devices -- the Radon Measurement Proficiency and Radon Contractor Proficiency programs -- in order to protect consumers and to help build an industry capable of meeting the demand for radon-related services.

EPA provides funding to the states to implement radon programs through the federal State Indoor Radon Grants (SIRG) program.¹⁶ State activities in the area of radon in residential buildings generally parallel those at the federal level, with most states focusing on public education and promotion of radon testing. Many states have gone further by adopting legislative and regulatory requirements. Approximately 17 states and the District of Columbia have adopted legislation establishing certification or licensure programs for radon professionals and radon devices.¹⁷ Almost as many states have laws that require disclosure of some type of radon information in the context of a residential real estate transaction.¹⁸ Two states have incorporated radon-resistant construction techniques into building codes.¹⁹

The outreach and education efforts by EPA, state and local government agencies, and private organizations have helped to increase significantly public awareness of radon since the issue first gained widespread attention in the mid-1980's. Today, an estimated 73 percent of the population claims to be aware of radon, although studies indicate that radon awareness varies considerably by income and race.²⁰ Nevertheless, while a substantial percentage of the population is generally aware of radon and its dangers by now, only about 10 percent have actually tested their homes, and just over two percent have undertaken radon mitigation.²¹

Health Association.

¹⁴ There are two basic ways to test for radon. Short term testing involves the use of a measurement device that remains in the building for 2-90 days; long term tests last for more than ninety days. EPA estimates that radon testing costs between \$20 and \$350 depending on the type of test and whether a radon measurement professional performs the testing.

¹⁵ 59 Fed. Reg. 13402 (March 21, 1994)

¹⁶ TSCA §306, 15 U.S.C. §2666.

¹⁷ See, e.g., Conn. Gen. Stat. §20-42; Fla. Stat. §404.056(5); Ky. Rev. Stat. §211.856; W.Va. Code §16-34-1, *et seq.*

¹⁸ Many of these laws were passed in 1992-1993 legislative sessions; see, e.g., 1993 Md. Laws 640; 1993 Miss. Laws 407; 1993 Montana House Bill 585; Ohio Rev. Code Ann. §5302.30; 1993 S.D. Codified Laws §43-4-44; 1993 Tex. Gen. Laws 356; Va. Code Ann. §55-519 (1993).

¹⁹ Washington Administrative Code, Chap. 51-13; N.J.Admin. Code 5:23-10.

²⁰ Conference of Radiation Control Program Directors, CRCPD Radon Risk Communication and Results Study (1994) [hereinafter, CRCPD Study]. According to CRCPD's 1994 nationwide survey, while 80 percent of Whites interviewed were aware of radon, the percentages were significantly less for Hispanics (47%), Asian/Pacific Islanders (46%), African Americans (50%), and Native Americans (70%). CRCPD's 1993 survey found that radon awareness was highest among people with household income above \$50,000 (81%) and those with incomes between \$25-50,000 (74%); awareness was 56 percent where income was between \$12-25,000 and only 49 percent where income was under \$12,000.

²¹ *Id.*

Although future radon strategies will seek to improve the rates of testing and mitigation generally, these strategies are particularly important in an area that heretofore has not been a focus of public policy concerning radon: the problem of radon in rental housing.²² Radon programs that seek to reduce the risk of residential radon exposure should incorporate policies that target rental property owners and tenants. Strategies that fail to address rental housing directly will miss a significant portion of homes in the United States. There are indications that rental housing is increasing at a greater rate than owner-occupied housing; of the total increase in households during the 1980's, rental households increased by 17 percent, as compared to 10 percent for owner-occupied households.²³

One-third of all rental housing units are single family homes, while 40 percent are found in buildings with five or more units, and 22 percent are in buildings of four stories or higher.²⁴ The fact that a considerable percentage of all rental housing units may be found in larger buildings raises questions about appropriate testing and mitigation techniques. With respect to single family homes, EPA and the Surgeon General recommend testing all homes below the third floor, where radon is generally concentrated.²⁵ It is less clear what the appropriate testing protocol is for multistory buildings with elevators and interior air shafts, which might affect the radon concentrations at upper stories. With respect to mitigation, EPA has indicated that most mitigation techniques used in single family homes may be applicable to multifamily residential buildings as well.²⁶

Further efforts are needed to develop radon testing and mitigation protocols for multifamily housing. One initiative currently underway is an interagency agreement between EPA and the U.S. Department of Housing and Urban Development (HUD), signed in September, 1992, under which EPA is to test a number of HUD-owned properties and undertake mitigation in selected properties with radon levels above 4 pCi/L.²⁷ According to the agreement, one result

²² To date, public education campaigns have targeted homeowners. One major initiative currently being undertaken at federal, state and local levels, is the promotion of radon testing in the context of the residential real estate transaction, generally the purchase and sale of single family homes. EPA has recently published its Home Buyer's and Seller's Guide to Radon, which provides information about how to address radon when buying or selling a home.

²³ Housing in America, *supra* note 2, at 41. There have been few surveys of radon levels focusing on the rental housing stock. In New York, a study of 250 rental units resulted in 66% testing above EPA's action level of 4 pCi/L, while another study of 36 rental properties found 20% with elevated levels. "Radon Risks Higher for Low Income Americans, Cornell Study Says," Indoor Air Review, 17 (Dec. 1993)

²⁴ Housing in America, *supra* note 2, at 2. Since many rental units are in multifamily buildings, and since radon mitigation is performed on an entire structure rather than on an individual unit within the structure, the extent to which radon mitigation may be required in rental housing is not necessarily reflected in the total number of rental households.

²⁵ A Citizen's Guide to Radon, *supra* note 10, at 3.

²⁶ According to EPA,

limited mitigation experience has shown that some of the same radon reduction systems and techniques used in residential buildings can be scaled up in size, number, or performance to effectively reduce radon in larger buildings.

58 Fed. Reg. 19097, 19103 (April 12, 1993).

The applicability of mitigation techniques such as sub-slab depressurization may depend mainly on the "footprint" of the building -- i.e., the amount of square feet in contact with the ground. Thus, high-rise buildings and townhouse developments may present very different circumstances for mitigation. Telephone conversation with U.S. Environmental Protection Agency official (July 13, 1993).

²⁷ Interagency Agreement (HUD) DU100I920000053, (EPA) RW86935/44/01/0.

of mitigating these buildings will be to demonstrate the applicability of existing mitigation techniques in multifamily dwellings. Based on the results of the testing and mitigation program, EPA is to prepare protocols and guidebooks for HUD, and is to provide HUD with information on costs associated with testing and mitigation of multifamily housing.²⁸

C. The Need for a Unique Approach to Reducing Radon in Rental Housing

The physical differences between multifamily rental housing and owner-occupied single family housing raise certain technical, and possibly financial, issues which need to be taken into account in designing appropriate radon reduction strategies. This paper, however, focuses on the legal and policy challenges that stem from other particular differences between rental and owner-occupied housing -- differences relating to the legal and financial status of tenants and owners. Because of the differences in the legal and financial status of tenants, radon programs must focus specifically on the rental context if they are to achieve significant radon risk reduction in rental housing.

In the rental housing context, the individuals exposed to radon are not those with legal and financial control over the premises. For this reason, risk communication strategies targeted to homeowners may fail to reduce exposure to high radon levels in rental housing, because rental property *owners* are not the parties facing potential health risks from living in the property. Therefore, education efforts and testing programs must be geared to tenants as well.²⁹

Nevertheless, radon education alone may fail because tenants generally lack the legal authority to make major repairs or alterations to the premises necessary for reducing high radon levels. Thus, even assuming that a tenant is informed about radon, tests her rental unit, and is prepared to arrange for the necessary radon mitigation services, she may be unable to do so.

Education strategies aimed at tenants may also prove ineffective on their own to the extent that tenants feel they do not have a sufficient stake in the rental property to undertake radon mitigation. Tenants clearly lack the financial stake that owners have, since any financial benefit from permanent improvements to the premises will ultimately accrue to the owner. In addition, many tenants perceive a minimal possessory stake in the premises; because the health risks posed by radon are long-term, tenants who do not expect to remain in a particular rental unit for a long period of time may not perceive considerable health benefits from radon reduction in that unit.³⁰

²⁸ *Id.* at 6. As of this writing, the agencies are planning to develop testing protocols but not mitigation protocols, due to funding limitations. However, it is unclear whether these testing protocols will address questions relating to large multifamily buildings.

²⁹ Sixty-four percent of renters are aware of the problem of radon, compared to 77 percent of home owners. CRCPD Study, *supra* note 20.

³⁰ In its recent survey on housing trends, the Census Bureau found that "as usual, renters were much more mobile than owners." Housing in America, *supra* note 2, at 48. In 1989, 36 percent of renters moved, as compared to eight percent of owners. *Id.*

Another important difference between rental and owner-occupied housing is that renters are more likely to lack the financial means to undertake mitigation. In 1989, median household income was 84 percent higher for owners than renters -- \$33,300 for owners compared to \$18,100 for renters.³¹ While 27 percent of owner-occupied units had a household income under \$20,000 per year, 55 percent of rental units were below that level, and 30 percent were below \$10,000.³² As these figures suggest, many tenants simply cannot afford the cost of radon mitigation, even if they had the authority to mitigate and the interest in doing so. Over 6 million rental households -- nearly 20 percent of renters -- pay more than half of their income for housing costs.³³ The long term threat of radon exposure competes with more immediate survival needs of many low income families, such as food, clothing, medical care, transportation and utilities. Moreover, even if they were aware of high radon levels in their home, most low and moderate income tenants probably would not have the option of moving into alternative, radon-safe housing that they could afford.³⁴

Strategies designed to promote radon risk reduction in new or existing rental properties must, therefore, take into account the characteristics of the rental housing market, as they affect low and moderate income families. The shortage of affordable housing, combined with the scarcity of funds to improve that housing or to build new affordable housing, calls for an approach to radon risk reduction that incorporates mechanisms for funding testing and mitigation, in addition to education. While policies that seek to ensure mitigation of high radon levels in rental property will involve financial costs -- both to government and private parties -- the potential cost of inaction is measured in lives lost to cancer each year. The evidence to date of the health consequences associated with exposure to high levels of radon presents a strong case for taking action.

II. RADON AND RENTAL HOUSING: THE LEGAL LANDSCAPE

Legal responsibility for radon hazards in rental housing is an area that is, as yet, ill-defined. There have been few cases decided or laws enacted to clarify these responsibilities. Existing laws and legal principles most relevant to radon in rental housing are not adequate to address the problem.

This section first discusses the liability of landlords for tenant exposure to high radon levels, and concludes that reliance on potential tort liability alone will not result in significant radon risk reduction. It next describes a range of possible legal measures for clarifying the duty of providers of rental housing to reduce unacceptable radon levels. With respect to *existing* rental properties, the paper suggests that legislation require radon testing and, if necessary,

³¹ *Id.* at 28.

³² *Id.* at 29.

³³ *Id.*

³⁴ The shortage of affordable housing has been widely publicized in recent years. *See, e.g.*, Center on Budget and Policy Priorities & The Housing Assistance Council, The Other Housing Crisis: Sheltering the Poor in Rural America, (December, 1989); Center on Budget and Policy Priorities, A Place to Call Home: The Crisis in Housing for the Poor (April, 1989).

mitigation either (a) at the point of sale or transfer of the property or (b) by the landlord, in the context of the landlord-tenant relationship. The section then suggests that with respect to *new* residential rental property, legislation should mandate the use of radon-resistant construction techniques to help prevent high radon levels in new properties.

A. Liability for Damages Resulting from Hazardous Conditions

Liability for tort damages creates an indirect means of promoting the maintenance of safe conditions in rental property, insofar as the potential imposition of tort liability on landlords³⁵ creates an incentive to maintain premises. Potential liability for damages from radon exposure does not significantly influence radon testing and mitigation in rental properties. Other legal measures aimed directly at radon risk reduction are needed.

1. Background

Traditionally, landlords were immune from tort liability for injuries to tenants resulting from defects in the premises. The law presumed that tenants had an opportunity to inspect, and that they assumed the risk of the premises they rented.³⁶ Some state courts have continued to follow this principle.³⁷

With the establishment of judicial doctrines and laws requiring landlords to maintain rental premises, courts have begun to move away from the doctrine of landlord tort immunity. Tenants living with dangerous defects have sought not only rent abatement and repairs, but also damages for injuries resulting from the defects. Prototypical cases involve tenants injured after falling down a defective stairway, or tenants injured from a fire resulting from faulty electrical wiring. Courts have increasingly applied a negligence standard in such cases, under which the landlord may be liable for failing to exercise reasonable care in maintaining the premises in safe condition.³⁸

³⁵ This paper addresses liability claims against landlords only. In other contexts, notably lead paint and asbestos, tenants have filed lawsuits against manufacturers, seeking damages for injuries resulting from exposure to the manufactured substances present in their homes. Any similar claim in the radon context would likely be against the builder of the home, for constructing the home in a manner that resulted in high concentrations of radon in the home. Although this paper will not discuss a builder's liability for structural defects resulting in injury to a tenant, some courts have dealt with this issue. *See, e.g., Stephens v. Stearns*, 678 P.2d 41 (Idaho 1984) (builder who failed to construct a handrail for stairway owed duty of care to tenant). Generally, though, cases brought by tenants involving structural defects have been against landlords, based on the landlord's general duty to maintain the premises free of defects.

³⁶ Love, "Landlord's Liability for Defective Premises: Caveat Lessee, Negligence or Strict Liability?" 19 Wisc. L. Rev. 19, 48-9. As noted *infra* footnote 71, there were certain exceptions to this principle.

³⁷ *See, e.g., Dapkunas v. Cagle*, 356 N.E. 2d 575 (Ill. 1975); *Maxwell v. Davco Corp.*, 776 S.W. 2d 528 (Tenn. 1989); *Hebert v. Green County Housing Auth.*, 558 So. 2d 926 (Ala. 1990).

³⁸ *See, e.g., Pagelsdorf v. Safeco Ins. Co.*, 284 N.W. 2d 55 (Wisc. 1979); *Shroades v. Rental Homes, Inc.*, 427 N.E. 2d 774, (Ohio, 1981); *Mansur v. Eubanks*, 401 So. 2d 1328 (Fla. 1981); *Norwood v. Lazarus*, 1634 S.W. 2d 584 (Mo. 1982); *Jackson v. Wood*, 726 P.2d 796 (Kan. 1986).

State statutes that create a landlord's duty to repair unsafe conditions do not usually provide expressly for a legal cause of action in tort or for personal injury damages.³⁹ However, such laws have helped to shape the transformation in landlord tort liability.⁴⁰ Some courts have held that the violation of a warranty of habitability⁴¹ or of a statute establishing a landlord's duty to maintain the premises amounts to negligence *per se*.⁴² Other courts have found that such violations are evidence of negligence.⁴³

This standard of care is reflected in Section 17.6 of The Restatement (Second) of Property, which provides for liability if: 1) the landlord has failed to exercise reasonable care in maintaining the premises and 2) the defective condition leading to the injury is either a breach of the warranty of habitability or a breach of a statutory duty to repair. According to this formulation, a landlord is liable only if she or he knew, or should have known, of the existence of the defect.

Few courts have found that landlords are *strictly* liable in tort for injuries resulting from defective conditions in rental premises. California courts have ruled that landlords who are engaged in the business of leasing dwellings are strictly liable for injuries resulting from latent defects in the premises, when the defects existed at the time the premises were leased to the tenant.⁴⁴ Louisiana law creates strict liability for a tenant's injury caused by defects in the premises, although the meaning of "defects" is defined somewhat narrowly.⁴⁵

³⁹ Nebraska's statute states that "the obligations imposed by this section are not intended to change existing tort law in the state." Neb. Rev. Stat. §76-1419 (1990).

At least one state statute establishing the landlord's duty to repair unsafe conditions does, however, provide for tort liability. Provided that a tenant notifies the landlord of defective conditions under the tenant's control, Massachusetts law states that a tenant who is "injured as a result of the (landlord's) failure to correct said unsafe condition within a reasonable time shall have a right of action in tort against the landlord or lessor for damages." Mass. Gen. Laws, ch. 186, §19.

⁴⁰ See 63 ALR 4th 883 "Landlord Negligence - Services" §2(a). See also Gardenvillage Rlty. Corp. v. Russo, 366 A.2d 101 (Md. 1976) (landlord liable for damages resulting from violation of building code).

Professor Browder has stated: "the notice requirement [contained in duty to maintain statutes and the warranty of habitability] has been assumed by some courts to invoke ordinary negligence as the governing theory of liability." Browder, "The Taming of a Duty - The Tort Liability of Landlords," 81 Mich. L. Rev. 99, 131. This may result from the fact that such laws typically establish a standard of reasonable conduct; that is, the landlord is only in violation of the duty to maintain if he or she knows (or should have known) of the defect, and has had an opportunity to repair.

⁴¹ In the 1970's, courts began establishing an "implied warranty of habitability," which found that landlords were responsible for maintaining rental premises in habitable and safe condition. This is discussed further in Section C, below.

⁴² See Shroades, *supra* note 38; Ford v. Ja-Sin, 420 A.2d 184 (De. 1980).

⁴³ Bennet M. Lifter, Inc. v. Varnado, 480 So.2d 1336 (Fla. 1985); Williams v. Foutes, 417 N.E.2d 963 (Mass. 1981); McCoy v. Coral Hills Assocs., 264 A.2d 896 (D.C. 1970).

⁴⁴ Muro v. Superior Court, 184 Cal. App. 3d 1089 (Cal. 1986); Becker V. IRM Corp., 38 Cal. 3d 454, 698 P.2d 116 (Cal. 1985).

⁴⁵ La. Stat. Ann., Civil Code Art. 2695. See Ivey v. Housing Auth. of City of Mansfield, 514 So.2d 661 (1987). Louisiana courts have held that a landlord may avoid the imposition of strict liability when the tenant has an independent obligation to repair the defective conditions, Wilson v. United States, 434 F.Supp 72 (1977), and where the tenant's negligence caused the defect, Ambrosia v. Cherokee Ins. Co., 332 So.2d 559 (1976).

2. Radon and Landlords' Liability for Defects

No reported decisions have established directly the existence or absence of landlord liability for radon exposure in rental housing.⁴⁶ In cases involving exposure to other environmental harms, courts have differed on the extent to which landlords are liable to tenants.

In cases dealing with injury resulting from exposure to lead-based paint, for example, the determination of liability seems generally to follow the state doctrine on landlord liability for defects in the premises. One state court which follows the traditional tort rule of non-liability of landlords, has found that the landlord is not liable for lead poisoning unless the defect existed at the time the unit was rented, and the landlord knew of the defect and concealed it from the tenant.⁴⁷ In states that apply negligence principles to landlord liability, courts have found that the landlord must have knowledge of the presence of lead-based paint in order to be liable, though they have differed as to when a landlord is presumed to have such knowledge.⁴⁸ Some courts have found landlords strictly liable for lead poisoning; however, these cases are not as analogous to the problem of radon because liability was based in large part on the existence of state laws prohibiting lead-based paint.⁴⁹

One court has found that a tenant whose child suffered nerve damage from exposure to formaldehyde in her apartment could not recover from the landlord where the landlord did not know about the condition.⁵⁰ The court found that the state statutory warranty of habitability did not extend strict liability to landlords for unknown defects.

Therefore, knowledge of high radon levels is probably a prerequisite to landlord liability. Currently, landlords are not required by law to test for radon. Even where a rental unit has not been tested for radon, a tenant might claim that the landlord should have known about the condition. This is essentially a claim that the landlord should have tested for radon, since the only way to know about high radon levels in a particular building is through testing. Because the

⁴⁶ Two cases have addressed liability for radon outside the rental context. Brafford v. Susquehanna Corp., 586 F.Supp 14 (D.Co. 1984), involved a family that moved into a house located on the site of a former uranium milling facility. The family brought suit against the mill owner, claiming that the company's placement of mill tailings in and around the foundation of their home resulted in high radon levels in the home. The court found that plaintiffs could bring a claim for damages for chromosomal changes resulting from the radon exposure, as well as for the increased risk of future cancer.

In Wayne v. Tennessee Valley Authority, 730 F.2d 392 (5th Cir. 1984), homeowners brought suit against the producer of the phosphate slag used in the concrete blocks of their home, as well as against the manufacturer and seller of the blocks. The court decided that plaintiffs could not bring their claim for damages resulting from high radon levels in the building materials, since at the time the blocks were sold, radon gas was not identified as a potential health concern in phosphate products.

⁴⁷ Dunson v. Friedlander Realty, 369 So.2d 792 (Ala. 1979).

⁴⁸ See, e.g., Norwood v. Lazarus, 634 S.W.2d 584 (Mo. 1982) (landlord negligent where he knew there was flaking lead-based paint in hallway, and that child played in that area); Acosta v. Irdank Realty Corp., 238 N.Y.S.2d 713 (1963) (landlord negligent where he knew of existence of lead-based paint in apartment, and ingestion of paint by child was foreseeable). Cf. Winston Properties v. Sanders, 565 N.E.2d 1280 (Ohio 1989) (fact that landlord was aware of peeling, cracked paint does not mean landlord knew of existence of lead-based paint hazard).

⁴⁹ See, e.g., Hardy v. Griffin, 569 A.2d 49 (Ct. 1989) (landlord strictly liable for lead poisoning where state and city laws made the existence of lead-based paint a violation of the state's general statutory duty to maintain); Bencosme v. Kokaras, 507 N.E.2d 748 (Mass. 1987) (landlord strictly liable for lead poisoning based on state law prohibition).

⁵⁰ Meyer v. Parkin, 350 N.W.2d 435 (Minn. 1984).

health hazards of radon are now widely publicized and landlords have some responsibility for the safety of the premises they lease, a court might find that the landlord should have tested for radon. Although it may be difficult to succeed with this argument, a court might be more likely to make such a finding if the rental premises are in an area identified by EPA or the state as a high radon potential area.

In order to recover damages for exposure to high radon levels, tenants must demonstrate not only that the landlord has knowledge of the problem, but also that the exposure resulted in some harm. Since cancer is associated with long term radon exposure, tenants who have been exposed to high radon levels may be seeking damages for their enhanced *risk* of developing cancer. Although some courts have allowed recovery for increased susceptibility to cancer,⁵¹ traditional tort law prohibits recovery for anticipated injury.⁵² While there has been significant judicial and scholarly consideration of this issue, the likelihood of recovering damages resulting from radon exposure remains highly uncertain.

3. Strategies for addressing landlord liability for damages resulting from radon exposure

Potential tort liability would provide a stronger incentive to mitigate high radon levels if landlords were required by law to test for radon. Such a requirement would enable a tenant to demonstrate actual or constructive knowledge on the part of the landlord. This would still leave open the question of the landlord's duty of care in addressing the high radon levels. That is, a court might find that a landlord is required only to notify tenants of the problem, or courts might craft different formulations of the landlord's obligation to mitigate high levels.

In addition to defining a landlord's obligations with respect to ensuring acceptable radon levels, a law could explicitly state that violation of its provisions results in liability. Even without statutory language referring to landlord tort liability, violation of a radon statute might be interpreted as evidence of negligence or as negligence *per se* where the statute sets forth specific duties intended to protect a clearly defined class of persons -- e.g., where the statute requires landlords to mitigate high radon levels in rental housing.

Even if a landlord's duty of care were clarified, tenants exposed to high radon levels would still face significant obstacles to recovering personal injury damages. Proving injury may be extremely difficult. Moreover, tenants would face other barriers to bringing a tort suit. First,

⁵¹ See Cross & Murray, "Liability for Toxic Radon Gas in Residential Home Sales," 66 N.C.L.Rev. 687, 725-26 (1988). Even where such claims were allowed, plaintiffs would have to demonstrate that they have a significant probability of developing cancer. Where courts have allowed recovery for enhanced risk, they have generally required at least a 50% probability of developing cancer; typical risk from exposure to high indoor radon levels may be only about one percent. *Id.* at 726-27, 730.

In one case involving radon exposure, the plaintiffs were able to claim that they suffered present injury in the form of subcellular changes, and joined to this a claim for risk of future cancer. Brafford v. Susquehanna Corp., 586 F.Supp. 14 (D.Colo. 1984).

⁵² See Prosser & Keeton on the Law of Torts §30 (W. Keeton, 1984).

tenants often lack information, both about radon and about their legal rights. Second, lower income tenants may lack the financial resources to bring suit; the potential difficulty of proving injury will make it less likely that such tenants can find an attorney willing to take the case. Finally, tenants -- particularly those with limited housing options -- may be loath to bring a tort suit for fear of retaliation by the landlord.

Rather than waiting for the courts to determine, in the context of a tort suit, the reasonable standard of care for landlords with respect to high radon levels, states could clarify the standard of care through legislation defining the duties of the owner/landlord.

B. Radon Disclosure, Testing and Mitigation in the Sale or Transfer of Rental Properties

The real estate transaction is widely recognized as a key trigger point for radon testing and mitigation and provides an important opportunity for radon risk reduction in rental properties. The approach generally taken with respect to owner-occupied homes -- the disclosure of radon information to prospective purchasers -- will not prove as effective in the transfer of rental property. More aggressive measures are needed in order to achieve radon testing, disclosure and mitigation in rental property transfers.

1. Background

Although the real estate transfer has been a central focus of radon risk reduction efforts to date, these efforts have not generally resulted in the imposition of requirements for radon testing and mitigation. One exception is a New Hampshire regulation requiring that the transferor of any building sold, leased or given to the state demonstrate that the building's radon level is below 4 pCi/L.⁵³

Instead, most laws that promote radon reduction in the real estate transfer generally do so by establishing requirements for disclosure of information on radon to prospective purchasers. There are essentially two categories of radon disclosure requirements: "general" disclosure and "specific" disclosure. General disclosure is essentially a vehicle for providing brief educational information on radon to a particular segment of the public, in this case the purchaser of residential property. Although general disclosure does not provide information about the radon levels in a particular property, a number of states have promoted such disclosure in the belief that an educated buyer may pursue radon testing (and if necessary, mitigation) before purchasing the property, in order to avoid the potential risk of exposure. A few states have passed laws requiring this form of disclosure.⁵⁴

⁵³ New Hampshire Rules He-P 1804.02, 1804.05.

⁵⁴ See, e.g., Fla. Stat. Ch. 91-04 §404.056(8); R.I. Gen. Laws §45-24.3-23; 1993 Montana House Bill 585.

Specific disclosure refers to the provision of radon information relating to the particular property being transferred. Within the category of specific disclosure, there are two types of requirements that could be made applicable to sellers of residential property. The first type would mandate the disclosure of the property's radon levels only where the seller already had the information. The second type would require the seller affirmatively to obtain information on the property's radon level and provide that information to the purchaser.

A number of states have enacted laws requiring sellers of residential property, including rental property, to disclose the existence of certain known conditions or defects in the property. Increasingly, states are including radon among a checklist of hazards which must be disclosed if the seller is aware of their existence.⁵⁵ New Jersey law contains a separate statutory provision requiring that a seller disclose the results of radon testing to prospective buyers, but only if the seller actually knows the radon levels in the home.⁵⁶

Federal law currently does not require disclosure of radon information to prospective purchasers of residential real estate. The recently enacted Residential Lead-Based Paint Hazard Reduction Act of 1992 (Public Law 102-550) does require the provision of such information to purchasers regarding another indoor hazard, lead-based paint. Section 1018 of this law requires that before a purchaser is obligated under a contract, the seller must provide the purchaser with general information about lead, inform the purchaser of any known lead-based paint hazards, and allow the purchaser a 10-day period to conduct an inspection for the presence of lead-based paint hazards. Federal legislation containing a similar disclosure measure with respect to radon has been proposed.⁵⁷

2. Strategies for Promoting Radon Testing, Disclosure and Mitigation in the Sale of Rental Property

The real estate transaction provides an important opportunity for promoting radon testing, disclosure and mitigation in rental property.

a. Testing and Disclosure

As noted above, a number of states already require the disclosure of general radon information during the sale of residential real estate. State or local governments can go one step further by establishing a specific radon disclosure scheme that involves testing and disclosure of radon levels by owners⁵⁸ in properties being sold or transferred. At the federal level, Congress could make testing a requirement for obtaining a "federally related" mortgage loan or for lenders'

⁵⁵ See *supra* note 18.

⁵⁶ N.J. Stat. §26:2D-73.

⁵⁷ S. 657, introduced by Senator Lautenberg in March, 1993; H.R. 2448, introduced by Representative Markey in June, 1993.

⁵⁸ This section looks at disclosure requirements placed on sellers or transferors of residential rental property. Other parties, such as real estate agents, may be involved in the sale transaction, and therefore might be appropriately made subject to disclosure requirements in certain circumstances.

participation in the secondary market through federally established secondary mortgage institutions.⁵⁹

Requiring disclosure of rental property's actual radon level to prospective purchasers is likely to be the most effective approach to disclosure. Because prospective purchasers of rental properties will be concerned with the condition of the property, particularly to the extent that the condition may lead to liability of that purchaser, mitigation of high levels is more likely to occur if actual levels are disclosed. Where testing is made part of the routine property inspection, purchasers might also have greater difficulty obtaining a mortgage loan if the problem were not remedied. Requiring testing prior to the sale of rental property presents an opportunity for negotiating the costs of mitigation and testing between buyer and seller.

Specific disclosure can therefore be a valuable tool for promoting mitigation of high radon levels. If accompanied by a requirement that test results be reported to state and local officials, this type of disclosure requirement could also help provide more comprehensive data for federal, state and local agencies on the extent of radon problems in rental housing. This could greatly assist agencies in their efforts to develop effective programs for addressing radon.⁶⁰

This approach to disclosure is superior to requiring disclosure of radon levels only where those levels are already known, which may actually *discourage* radon testing because the seller is not required to disclose any information he does not already have. Moreover, the seller may already be required to disclose high radon levels under common law if he is aware of them.⁶¹

Specific disclosure is also preferable to the disclosure of only general information on radon, since such warnings would not target risk communication to the persons who will actually face potential health risks. Purchasers of rental property who receive such general warnings may be motivated to test for and mitigate high radon levels if they perceive potential liability for their failure to do so. However, it is highly uncertain whether a court would find a rental property owner liable for failing to test for radon based solely on his earlier receipt of a general radon warning during the real estate transaction.

⁵⁹ See Paul A. Locke, "Promoting Radon Testing, Disclosure and Remediation: Protecting Public Health Through the Home Mortgage Market," 20 Environmental Law Reporter 10475 (Nov. 1990), in which the author recommends that general radon disclosure be made a requirement for obtaining a "federally related" home mortgage, and that radon testing and mitigation be made requirements for mortgage lenders to participate in the secondary mortgage market. "Federally related mortgage loan" is defined under the Real Estate Settlement Procedures Act of 1974 as any loan that is secured by a first lien on residential real property and is (1) made by a lender who is regulated or insured by the federal government; (2) assisted in any way by the federal government; (3) intended to be sold to a federal government-created secondary mortgage institution; or (4) made by a creditor who makes or invests in more than \$1,000,000 in real estate loans per year. *Id.* at 10480, citing 12 U.S.C. §2602(1).

⁶⁰ Several states have adopted reporting requirements in connection with laws requiring the certification of radon professionals. Many of these laws safeguard the confidentiality of this information. While such confidentiality provisions are important to encourage reporting, two state reporting laws may actually have the effect of discouraging testing in rental property. New Jersey and Iowa statutes prohibit radon testers from disclosing (except to the state) information about the owner or address of any property tested, unless the building *owner* waives this right of confidentiality. N.J.S.A. 26:2D-73; Code of Iowa §136B.2. These laws could be interpreted to prevent a tenant from obtaining the results of a radon test which he initiated.

⁶¹ See, e.g., Schnell v. Gustafson, 638 P.2d 850 (Colo. App. 1981) (vendor of real estate has a duty to disclose to purchaser a known latent defect); Foust v. Valleybrook Realty Co., 446 N.E. 2d 1122 (Ohio App. 1981) (vendor has duty to disclose any material facts which are not visible).

b. Mitigation

To more effectively ensure acceptable radon levels in rental properties, legislatures can go a step beyond mandatory testing and disclosure by requiring mitigation where testing reveals high radon levels. Although mandatory testing alone may trigger remediation in many cases, there are strong policy justifications for making mitigation of high levels mandatory. Foremost among these is the fact that the health and well being of those who are not party to the real estate transaction -- i.e., tenants residing in the building -- are at stake. Such an approach may therefore be more appropriate for the rental real estate transaction than for owner-occupied properties.

To implement a radon mitigation requirement, state or local legislatures could enact legislation providing that a seller or transferor of residential property demonstrate that the property does not exceed the radon level established by law. The legislation would need to specify the type of proof necessary to demonstrate compliance. As with testing, mitigation could be made a federal requirement for obtaining a federally related loan or for lenders' participation in the secondary mortgage market through federally-established secondary mortgage institutions.⁶²

This approach takes advantage of the real estate transaction to ensure that residents of residential housing will not be exposed to high radon levels. The cost of mitigation under this approach would be the responsibility of the seller, although the seller might be able to recover part or all of those costs in the sale transaction. One drawback to this approach is that it does not address radon problems in rental properties that are not for sale or being transferred.⁶³ Another problem with this approach is its potential effect on the availability of affordable rental housing. The additional costs of radon mitigation could affect the economic viability of low and moderate income rental units. As noted below in Section III, financial subsidies targeted to affordable rental housing is an important component of public policy aimed at requiring mitigation during the transfer of such properties.

C. Radon Disclosure, Testing and Mitigation in the Landlord-Tenant Relationship

Landlord-tenant law provides another arena for implementing a duty to ensure acceptable radon levels in rental housing. The following discussion outlines existing landlord-tenant doctrines that address tenant safety and health, and suggests that these be expanded to include protection from exposure to high radon levels.

⁶² See *supra* note 60.

⁶³ See *supra* note 60, at 10482.

1. Disclosure of Radon Information to Tenants

a. Background

Traditionally, a landlord was not liable for damages resulting from defective conditions in rental premises.⁶⁴ One exception to this rule was the failure of a landlord to disclose a latent defect to the tenant, where the landlord knew of the defect.⁶⁵ This is still the law in a number of states,⁶⁶ though in recent years some courts have held that a landlord's lack of knowledge of a defective condition is not necessarily a defense to liability for damages resulting from the defect.

In either case, a landlord who knew, or should have known, of the existence of a hazard is potentially liable for injury resulting from the landlord's failure to disclose the hazard to a tenant. Where a landlord has tested for radon, the legal issues will be fairly straightforward. In most circumstances involving failure to disclose a radon hazard, however, the central question will likely be whether a landlord "has reason to know" -- i.e., should have found out through testing -- the radon levels in the housing he offered for rental.

Some states have enacted consumer protection laws that make the failure to disclose a material fact when leasing an apartment an unfair and deceptive trade practice.⁶⁷ Such laws might be applicable to a landlord who fails to disclose the existence of a known hazard when renting an apartment. Again, the question of when a landlord should be expected to know the radon levels in her or his property may be an issue in determining a violation of such a statute.

One state has enacted a law that addresses specifically radon disclosure to tenants. Florida law requires that the following notice be provided to tenants at the time of, or prior to, the execution of a rental agreement for any building:

RADON GAS: Radon is a naturally occurring radioactive gas that, when it has accumulated in a building in sufficient quantities, may present health risks to persons who are exposed to it over time. Levels of radon that exceed federal and state guidelines have been found in buildings in Florida. Additional information regarding radon and radon testing may be obtained from your county public health unit.⁶⁸

⁶⁴ See Restatement (Second) of Torts, §356.

⁶⁵ This doctrine is incorporated into section 358 of the Restatement (Second) of Torts:

A lessor of land who conceals or fails to disclose to his lessee any condition, whether natural or artificial, which involves unreasonable risk of physical harm to persons on the land, is subject to liability... if (a) the lessee does not know or have reason to know of the condition or the risk involved, and (b) the lessor knows or has reason to know of the condition, and realizes or should realize the risk involved, and has reason to expect that the lessee will not discover the condition or realize the risk.

⁶⁶ See, e.g., Krance v. Faeh, 338 N.W.2d 55 (Neb. 1983); Lemley v. Penner, 630 P.2d 1086 (Kan. 1981); Richards v. Dahl, 818 P.2d 418 (Or. 1980).

⁶⁷ See, e.g., Md. Comm. Law Code Ann. §13-301, *et seq.*

⁶⁸ Fla. Stat. Ch. 91-04 §404.056(8) (1988).

Federal law currently does not require disclosure of radon information to tenants. Proposed federal legislation contains a radon disclosure measure similar to the lead disclosure requirements of the Residential Lead-Based Paint Hazard Reduction Act of 1992, described above.⁶⁹ Section 1018 of that law requires that before a lease is entered into, the landlord is to provide the tenant with general information about lead, and to inform tenants of any known lead-based paint hazards.

b. Strategies

The provision of general radon warnings alone may not be effective in triggering widespread testing and mitigation, since this would not provide specific information about the tenant's own home. Moreover, tenants may lack the legal and financial means to take action. Therefore, in order to most effectively promote mitigation of high radon levels in the leasing of rental housing, specific disclosure requirements should be carefully crafted and combined with clear legal requirements for mitigating high radon levels.

Specific disclosure in the leasing transaction may promote mitigation of high radon levels, particularly where the disclosure requirement clarifies a separate, affirmative obligation on the part of the landlord to determine the radon levels in the premises. The effectiveness of this strategy depends on a range of related factors, including the tenant's level of awareness of the risks posed by radon exposure and the tenant's opportunities for ensuring radon reduction or obtaining alternate housing. One potential disadvantage of a specific disclosure law is that it could lead to claims by landlords that a tenant has assumed the risk of the radon hazard in a rental unit. On the other hand, specific disclosure requirements could be very useful in educating tenants and ensuring compliance with radon mitigation requirements.

2. Radon Testing and Mitigation: The Duty to Maintain Rental Premises

a. Overview of landlord duty to maintain premises

Strategies for achieving radon testing and mitigation in the context of the landlord-tenant relationship can best be evaluated within the legal framework governing the landlord's duty to maintain rental premises free from unsafe or hazardous conditions. These legal obligations are determined at the state and local levels, by both common and statutory law. Although there are significant differences among states, some general underlying principles apply.

Until fairly recently, landlord-tenant relations were largely governed by the doctrine of *caveat emptor*.⁷⁰ Traditionally, the rental transaction was perceived as essentially a conveyance of land, and the lessee took the property as is.⁷¹ A tenant faced with unsafe or unhealthy living

⁶⁹ See *infra* note 57.

⁷⁰ See generally, Browder, *supra* note 41, at 101 (with citations).

⁷¹ *Id.* See also, Love, *supra* note 36, at 28-31; Restatement (Second) of Torts §356. Certain exceptions to this rule were established. For example, the landlord was responsible for defects where the premises were under construction at the time of

conditions had two main options for redress: abandon the premises and terminate the lease under the theory of constructive eviction, or remain in the unit and bring an action against the landlord for damages.⁷² Because the tenant's covenant to pay rent was deemed independent of any covenant on the part of the landlord to repair the premises, a claim based on defective premises did not entitle the tenant to withhold rental payments.⁷³

In the 1960's, continuing urbanization and concentration of housing prompted courts to address a landlord's responsibility for the condition of rental property.⁷⁴ In 1970, the case Javins v. First National Realty Company⁷⁵ marked the end of the doctrine of *caveat emptor*, and established a landlord's duty to repair leased premises. The Javins court noted that the provision of housing had come to be seen less as a conveyance of land and more as the provision of services, and that modern rental leases involved

a well-known package of goods and services - a package which includes not merely walls and ceilings, but also adequate heat, light and ventilation, serviceable plumbing facilities, secure windows and doors, proper sanitation and proper maintenance.⁷⁶

The court thus found an implied warranty of habitability in rental housing, analogous to implied warranties in the sale of goods.

Since then, most states have either recognized the implied warranty of habitability in rental housing, or have adopted statutes providing for a landlord's duty to repair premises.⁷⁷ In addition, state and local governments have developed housing codes that set forth the minimum standards for residential rental units. These changes in the law regarding the condition of rental housing units have brought about corresponding new remedies, both public and private, for addressing substandard conditions.

Implied Warranty of Habitability

Many states have a judicially created implied warranty of habitability in rental housing,⁷⁸ and some have enacted statutes codifying the warranty.⁷⁹ Although the precise scope may vary, the warranty of habitability generally provides that in leasing a residential unit, a landlord impliedly warrants that there are no latent defects in the unit, and that the landlord will maintain the unit in a habitable condition for the term of the lease. Most warranties include, but are not limited to, compliance with applicable housing codes, although not all violations of a housing

leasing, where the landlord failed to disclose defects about which she or he had actual or constructive knowledge, or where defects occur in premises that are used in common by all tenants and that remain in the control of the landlord. *See* Love at 28-31, 66 notes 238, 241; Restatement (Second) of Torts §§357-362.

⁷² *Id.* at 33-37.

⁷³ *Id.* at 33-4, *citing* Restatement of Contracts §290 (1932).

⁷⁴ *See, e.g., Pines v. Persson*, 14 Was. 2d 590; 111 N.W. 2d 409 (1961). *See generally*, Love, *supra* note 36, at 91-98.

⁷⁵ 428 F.2d 1071 (D.C. Cir.).

⁷⁶ *Id.* at 1074.

⁷⁷ Alabama, Arkansas, Colorado, Mississippi, and South Carolina neither recognize an implied warranty of habitability nor have statutory provisions requiring landlords generally to maintain rental premises.

⁷⁸ *See, e.g., Green v. Superior Court*, 517 P. 2d 1168 (Cal. 1974); Boston Housing Authority v. Hemingway, 293 N.E. 2d 831 (Mass. 1973). *See generally*, Browder, *supra* note 41, at 11 n.50.

⁷⁹ *See, e.g.,* N.Y. Real Property Law, §235-b; Minn. Statutes §504.18.

code constitute violations of the warranty.⁸⁰ Since habitability is defined broadly to protect tenants' safety, health or well being, it is generally left to the courts to determine whether a particular defective condition is covered by the warranty.

The remedies provided a tenant for violations of the warranty of habitability go further than traditional common law remedies. The full range of contract remedies is often available, including damages, rescission, and specific performance.⁸¹ The most common remedy afforded tenants for violations of the warranty of habitability is rent abatement, whereby the tenant's rent is reduced to reflect the value of the premises during the period of noncompliance with the warranty of habitability. The precise measure of damages varies, although courts typically use the difference between the value of the premises as warranted and the value in their defective condition.⁸² Some courts have awarded consequential and incidental damages to tenants resulting from the defective conditions.⁸³

Tenants can usually raise a rent abatement claim affirmatively by filing suit, and place their rent in escrow while their claim is being adjudicated.⁸⁴ In addition, tenants are often permitted to withhold their rental payments, and raise the warranty of habitability and rent abatement claim defensively in a landlord's action for nonpayment of rent.⁸⁵ An important limitation on seeking relief, however, is that the tenant must generally provide notice of the defective conditions to the landlord and allow a reasonable amount of time for the landlord to make repairs.⁸⁶

Statutory Duty to Repair

In addition to or instead of recognizing a warranty of habitability, many states have adopted statutory provisions requiring landlords to maintain residential units.⁸⁷ Such statutes usually establish a general duty, corresponding to the duty established by a warranty of

⁸⁰ See, e.g., Boston Housing Authority v. Hemingway, 293 N.E.2d 831 (Mass. 1973).

⁸¹ See Mahlman v. Yelverton, 439 NYS 2d 568, 571 (N.Y. 1980).

⁸² See, e.g., Love v. Amsler, 441 N.W. 2d 555 (Minn. 1989); Miller v. C.W. Myers Trading Post, Inc., 355 S.E. 2d 189 (N.C. 1987). See generally 1 ALR 4th 1182, Measure of Damages for Landlord's Breach of Implied Warranty of Habitability.

⁸³ See, e.g., Roeder v. Nolan, 321 N.W. 2d 1 (Iowa. 1982) (incidental and consequential damages may be awarded); Teller v. McCoy, 253 S.E. 2d 114 (W. Va. 1978) (damages for annoyance and inconvenience may be awarded); Re: Clark, 96 BR 569 (BC E.D.Pa. 1989) (recovery allowed for expenses necessitated by defective conditions).

⁸⁴ See, e.g., Miller v. C.W. Myers Trading Post, Inc., 355 S.E.2d 189 (N.C.App. 1987).

⁸⁵ See, e.g., Detling v. Edelbrock, 671 S.W. 2d 265 (Mo. 1984); Romanow v. Heller, 121 Misc. 2d 886, 469 NYS 2d 876, aff'd 134 Misc. 2d 606, 513 NYS 2d 247 (N.Y. 1983).

⁸⁶ See, e.g., Drew v. Pullen, 172 N.J. Super. 570, 412 A. 2d 1331 (N.J. 1980).

Another remedy sometimes available to tenants is the self help remedy of "repair-and-deduct", whereby tenants make repairs themselves, and then deduct the reasonable cost of repairs from their rent payment.

⁸⁷ See, e.g., Fla. Stat. Ann. §83.51; Md. Real Prop. Art., §8-211; Ohio Rev. Code Ann. §5321.04.

habitability, to maintain premises in a fit condition.⁸⁸ Some statutes include examples of particular conditions that constitute violations of the duty.⁸⁹

The remedies provided under such laws generally parallel those available for violations of the warranty of habitability. Statutes frequently provide affirmative and defensive rent escrow actions, and authorize courts to abate rent and/or order the landlord to make repairs.⁹⁰ Some statutes also provide for recovery of damages.⁹¹

Housing Codes

For years, housing maintenance codes have been a principal means of prescribing minimum standards for residential rental units.⁹² Typically adopted at the county or city level, these codes address the maintenance of basic equipment and facilities; light, ventilation and heating systems; safety and sanitary condition of the dwelling; and minimum space requirements. Housing codes generally hold the landlord responsible for compliance with the code, and prohibit the rental of dwellings that are out of compliance.

Housing code enforcement is usually carried out by public officials authorized to inspect premises and issue notices of violation. Many provide fines and criminal penalties, and authorize court-issued injunctions. Some housing codes also authorize the code enforcement agency to proceed to make repairs where a landlord will not comply with an order, and then to recover the costs in an enforcement action.⁹³ Some states provide tenants with legal remedies for code violations, either as part of the housing code or under a separate statute.⁹⁴

⁸⁸ Section 2.104(a) of the Uniform Residential Landlord and Tenant Act states that "a landlord shall...comply with the requirements of applicable building and housing codes materially affecting health and safety....[and] make all repairs and do whatever is necessary to put and keep the premises in a fit and habitable condition." Although this standard follows the warranty of habitability doctrine, it is described as a "duty", rather than as a warranty or covenant.

Section 5.5 of the Restatement (Second) of Property has adopted the position that the landlord is responsible for maintaining the premises in a safe and sanitary condition, in compliance with the requirements of health, safety and housing codes.

⁸⁹ For example, coverage under Maryland's statute includes, but is not limited to lack of heat, light, electricity, or running water; lack of adequate sewage disposal facilities; infestation of rodents; and the existence of lead paint on surfaces within the home. Md. Real Prop. Art. §8-211(e).

Ohio's duty to maintain statute requires the landlord to keep the premises in "fit and habitable" condition, and specifically to maintain "all electrical, plumbing, sanitary, heating, ventilating, and air conditioning fixtures and appliances, and elevators...." Ohio Rev. Stat. Title 57, §5321.04(4).

⁹⁰ See, e.g., Md. Real Prop. Art. §8-211; Ohio Rev. Stat., Title 57, §5321.07.

⁹¹ N.M. Stat. Ann. §47-8-27(B) (damages and injunctive relief); Ky. Rev. Stat. §383.625; Neb. Stat. §76-1425.

⁹² The Housing Act of 1954, 42 U.S.C. §1451(c), required that municipalities seeking federal grants or loans for housing and urban development projects have housing codes in place and have programs for enforcing the code provisions. In the ten years after this law was passed, over 650 cities adopted housing codes. "Enforcement of Housing Codes," 78 Harvard Law Review 801, 803 (1965).

⁹³ See, e.g., Mass. State Sanitary Code, 105 C.M.R. §410.960.

⁹⁴ See, e.g., Mass. Gen. Laws c. 111, §§127C,F,L (state sanitary code, providing rent escrow and repair and deduct remedies); Ohio Rev. Stat. Title 53, §5321.07 (statute providing rent escrow and injunctive relief generally).

b. Radon and the Landlord's Duty to Maintain Premises

There are currently no federal or state laws that address directly the responsibility of landlords to reduce high radon levels in their properties.⁹⁵ Thus, absent legislative action, the main avenue for finding a legal duty on the part of landlords to fix radon problems is under an existing warranty of habitability or an existing statute requiring landlords to repair unsafe and dangerous conditions generally.⁹⁶

The argument that a warranty of habitability covers the existence of high radon levels is fairly straightforward. The implied warranty of habitability requires that rental housing units be maintained in a condition that does not threaten the health or safety of tenants. Radon has been identified as a Class A carcinogen by the federal government, and high indoor radon levels have been associated with lung cancer. A rental unit with high radon levels therefore poses a serious health threat to its occupants. There are no reported cases addressing radon in the context of the warranty of habitability.

Other indoor environmental hazards provide an analogy to radon. The problem of high levels of lead in paint and indoor air is perhaps the most apt. The inhalation of lead dust is demonstrated to cause significant health problems, notably neurological damage in young children. A number of courts have ruled that where a landlord is aware of the existence of lead paint, the landlord has a duty under the warranty of habitability to repair the condition.⁹⁷ In addition to these cases, one court has suggested that the presence of formaldehyde in an apartment could be a violation of a statutory implied warranty of habitability.⁹⁸ Along these lines, after notifying the landlord of the problem, a tenant who has been exposed to high radon levels could bring a warranty of habitability claim alleging that the landlord's duty to keep the premises free of defects that threaten health and safety requires that the landlord take action to reduce elevated radon levels.⁹⁹

⁹⁵ As noted above, there is at least one municipal ordinance that does require owners of rental housing to test for radon, and to mitigate if the test reveals levels over 4 pCi/L (the EPA action level). Town of Parsippany-Troy Hills Municipal Ordinance 89:31. As also mentioned earlier, New Hampshire regulations require property sold or transferred to the state to meet a 4 pCi/L radon standard. N.H. Rules He-P 1804.02, 1804.05.

Legislation has been proposed in the District of Columbia requiring owners of rental property to test for and mitigate high radon levels. *See, e.g.*, D.C. Bill 9-69. Such a provision, though, has not been enacted.

⁹⁶ The exception to the traditional rule of caveat emptor, for defects in premises that are used in common by all tenants, might also apply to the radon context. Since radon enters through the common portions of a building, and can be mitigated by making repairs to those common areas, tenants could argue that a landlord has a duty under the tradition common law rule (i.e., where no warranty of habitability applies) to remedy radon problems.

⁹⁷ *See, e.g., Acosta v. Irdank Realty Corp.*, 238 NYS 2d 713 (N.Y. 1963) (landlord also liable in tort for resulting injury to child, since ingestion of lead paint was foreseeable); *Norwood v. Lazarus*, 634 S.W.2d 584 (Mo. 1982) (landlord also liable in tort, as resulting injury to child was foreseeable). *See also, Winston Properties v. Sanders*, 565 N.E. 2d 1280 (Ohio 1989).

⁹⁸ *Meyer v. Parkin*, 350 N.W. 2d 435 (Minn. 1984) (rejecting claim for personal injury damages).

⁹⁹ A tenant might also be able to address high radon levels in water through a warranty of habitability or duty to repair claim. In *Elderkin v. Gaster*, 288 A.2d 771 (1972), the Supreme Court of Pennsylvania held that an implied warranty of habitability could be imposed against a builder for failing to ensure a potable water supply.

Tenants face certain difficulties in pursuing the claim that high radon levels violate an existing warranty of habitability or broad statutory duty to repair. The extent of the threat posed by exposure to high indoor radon levels has only recently received widespread attention. This contrasts with other environmental hazards such as lead-based paint, which is prohibited in residential rental dwellings in a number of states. Because there has been some question about the precise nature of the threat, and the radon level at which action should be taken, courts may be reluctant to find that radon mitigation falls within the landlord's existing statutory or common law duty. Moreover, because radon is a naturally occurring substance, there may be a perception that it is inappropriate to hold a landlord responsible.¹⁰⁰

Despite these difficulties, the considerable evidence of the health hazards associated with radon exposure provides tenants with solid grounds for asking courts to require landlords to mitigate high radon levels pursuant to an existing duty to repair. Rather than relying on the development of judicial doctrine in this area, however, state legislatures can take steps to ensure that a landlord's responsibility with respect to high radon levels is clearly established.

c. Legislative strategies for implementing a duty to mitigate high radon levels

Legislation could establish a duty to reduce high radon levels by 1) creating a statutory duty to reduce unacceptable radon levels; 2) amending an existing statute requiring landlords to repair unsafe conditions; or 3) amending an existing housing code.

The enactment of a new law dealing with radon alone would require landlords to test for radon and to mitigate unacceptably high levels. This type of legislation can be tailored to address unique features of the radon problem and may be more politically feasible than amending an existing, well-established state or local law. The new legislation could, for example, target radon testing and mitigation to only those areas that are known to be high radon potential areas, according to EPA's radon potential map. This has the advantage of focusing implementation and enforcement of the law on areas that are believed to have higher radon levels on average; it does not, however, ensure that all buildings with high radon levels will be mitigated. A preferable approach to targeting would be to establish a timetable for compliance with radon testing and mitigation requirements, starting with buildings located in high radon potential areas.

¹⁰⁰ Federal environmental laws have assigned financial responsibility for cleanup to parties who did not necessarily cause the problem. *See, e.g.*, Comprehensive Environmental Response, Compensation and Liability Act, 42 U.S.C. §9601 *et seq.* (creating Superfund liability scheme holding parties joint and severally and strictly liable); Surface Mining Control and Reclamation Act, 30 U.S.C. §§1231-1243 (establishing a fee on coal producers to reclaim and restore land and water resources adversely affected by prior coal mining operations).

Moreover, although radon is a naturally-occurring substance, it is possible to view high indoor radon levels as having been "introduced" into the home through the construction of the building. Because a house can be constructed in a way that helps keep radon from entering, the entry of radon through cracks in the foundation could be seen as a structural defect. In those (more limited) cases where high radon levels result from building materials or the water supply, this characterization is even more appropriate.

If a license or certificate of occupancy is required to operate the rental building, a radon law could require proof of radon levels below the established "action" level as a prerequisite to obtaining a license. In addition, a radon law requiring testing, and if necessary mitigation, should require that test results be provided to state and local radon agencies as well as to tenants. This will not only aid in enforcement of the law, but will also help to contribute to a better understanding of the nature of the radon problem in the state.

Rather than creating a new law, existing laws could be amended to add radon-related requirements. For example, a state statute obligating a landlord to repair unsafe and unhealthy conditions generally could be amended to include high radon levels as among the explicit conditions falling with the landlord's duty. Statutes of this type sometimes provide non-exclusive examples of conditions falling within their scope.¹⁰¹ To such a list could be added high radon levels, as defined in the law. Any existing remedies, such as rent escrow and rent abatement, would be applicable.

Similarly, applicable rental housing codes could be amended to include acceptable radon levels. Although no existing housing codes explicitly mention radon, such codes potentially are appropriate vehicles for establishing radon requirements. Many codes, for example, prohibit public nuisances, which may be broadly defined to include "unsafe, dangerous or unhealthful" conditions.¹⁰² A number of codes also prohibit the presence of other environmental hazards such as lead in paint,¹⁰³ and many regulate such "naturally occurring" elements as wind and rain, through requirements for weathertightness.¹⁰⁴

The inclusion of radon would trigger the remedies already provided in the housing code, which typically include inspection and fines, and occasionally include public agency authority to place a lien on the property and undertake directly the repairs. Housing codes might also trigger private remedies in some states, or can become the basis for a tenant action based on the warranty of habitability or on a statute creating a landlord duty to repair. These statutory and judicial mechanisms generally cover, though are not limited to, violations of all applicable housing codes. Since high radon levels may seriously affect residents' health, violation of housing code provisions addressing radon levels would likely fall within any warranty of habitability.

Because requirements for radon testing and mitigation may affect the availability of affordable housing, the use of financial subsidies targeted to housing for low and moderate income families should be considered in tandem with the development of legal requirements.

¹⁰¹ For example, Maryland's statutory duty to repair lists a number of conditions, including the existence of interior lead-based paint, that fall within the scope of the duty. Md. Real Prop. Art. §8-211(e)(4).

¹⁰² Montgomery County, Maryland, Housing and Building Maintenance Standards, §§26-1, 26-10(l); *see also* Chapter 150, Louisville Code of Ordinances, The Existing Structures Code, §§ES-201.0, ES-106.1.1 ("public nuisance" includes "any premises designated as unsafe for human habitation or use").

¹⁰³ *See, e.g.*, Chapter 150, Louisville Code of Ordinances, The Existing Structures Code, §§ES-303.3.1.

¹⁰⁴ *See, e.g.*, Denver Housing Code §27-21.

D. Building Codes Applicable to Rental Housing Construction

Radon-resistant new construction techniques can help *prevent* the problem of high radon levels in new rental housing. According to EPA, these techniques are more cost effective than mitigating high radon levels following construction.¹⁰⁵ Furthermore, radon-resistant new construction can enhance energy efficiency, and result in savings on the cost of heating and cooling a building.¹⁰⁶

1. Background

Most jurisdictions in the U.S. have adopted some form of building code that applies to residential construction. Some have state-wide codes, while others have codes adopted at the local level, generally by cities or counties. Four major model code organizations publish model codes that can be adopted or modified by state and local jurisdictions.¹⁰⁷ Codes provide minimum standards for protecting health and safety, and may include requirements relating to fire prevention, plumbing, mechanical systems and general building construction.

A few jurisdictions have incorporated radon-resistant construction requirements into their building codes. Washington, for example, has adopted a state Ventilation and Indoor Air Quality Code that requires radon-resistant construction techniques in new residential construction.¹⁰⁸ Montgomery County, Maryland has adopted radon-resistant construction techniques in its building code, although the code is applicable only to one and two family residential construction.¹⁰⁹

¹⁰⁵ EPA's estimates in this respect generally apply only to one and two family homes and to other residential buildings of three stories or less. The agency has estimated that it will cost builders between \$350-500 "per house" to install the type of "passive system" recommended by the agency's proposed model standards; the cost of activating such a system with a fan would be approximately \$250 for installation and \$40-75 annually to operate. By contrast, the cost of mitigating high radon levels in existing single family homes ranges from \$800 to \$2500. 58 Fed Reg. 19097, 19100 (April 12, 1993).

¹⁰⁶ EPA estimates that energy savings associated with implementation of its model construction techniques (resulting mainly from reduction in stack effect), may average \$65 per house annually. EPA, "Model Construction Standards: Building A Radon-Resistant Future" (1993) (unpublished material). It is not clear if the savings for multifamily housing would be comparable.

¹⁰⁷ These are the Council of American Building Officials (CABO), the Building Officials and Code Administrators International (BOCA), the International Conference of Building Officials (ICBO) and the Southern Building Code Congress International (SBCCI). Other organizations, such as the American Society for Testing and Materials, develop "standards" for design or performance of materials or equipment. These standards often become accepted practice in the field, and may or may not be explicitly incorporated into a code.

¹⁰⁸ W.A.C. Chap. 51-13.

¹⁰⁹ The county adopted and amended the 1989 edition of the CABO One and Two Family Dwelling Code, requiring radon mitigation in newly constructed detached and semidetached single family dwellings and townhouses. Executive Regulation 17-90 (1990).

New Jersey has also adopted standards and procedures for incorporating radon-resistant new construction techniques into the construction of certain residential buildings. N.J. Uniform Construction Code §5:23-10.1-10.4.

In addition to these state and local efforts, EPA has published radon-resistant construction standards to guide state and local jurisdictions in incorporating radon-resistant new construction into building codes. EPA's Model Standards and Techniques for Control of Radon in New Buildings contains specific construction techniques for use in all new one and two family residential construction in geographic areas of high radon potential.¹¹⁰ The American Society for Testing and Materials has also developed a Standard Guide containing radon-resistant construction techniques.¹¹¹ According to the EPA, as of 1993, approximately 200,000 homes had been constructed using radon-resistant techniques.¹¹²

2. Strategies for Promoting Radon-Resistant Construction in New Residential Rental Buildings

Considerable efforts are already underway to incorporate radon-resistant construction techniques into building codes. These efforts, however, have focused on one and two family dwellings of three stories or less. EPA's model standards and techniques are not intended to apply to larger residential buildings. In proposing the standards, the agency stated that construction standards applicable to such buildings have not been "fully demonstrated," but noted that limited experience shows that "some of the same radon reduction systems and techniques used in residential buildings can be scaled up in size, number or performance to effectively reduce radon in larger buildings."¹¹³

EPA should continue to encourage, and state and local governments should adopt, radon-resistant new construction code provisions. Continuation of existing efforts along these lines can have a positive effect on reducing radon risk in rental housing, to the extent that new one and two family homes and buildings under four stories are used as rental property. These efforts should be expanded to develop and promote radon-resistant techniques that are applicable to larger multistory structures, which contain a substantial number of all rental housing units.

Further development and communication of technical guidance in this area would facilitate use of radon-resistant construction features generally. The promulgation of model standards by the federal government or model code organizations might also promote the adoption of state and local building codes applicable to multifamily structures. State and local building codes could mandate the use of radon-resistant features in multifamily and multistory rental housing construction, or establish performance standards requiring that the radon levels in newly constructed buildings be below a stated level.

¹¹⁰ 59 Fed. Reg. 13402 (March 21, 1994).

¹¹¹ ASTM, Standard Guide E 1465.

¹¹² U.S. EPA, Implementation of OPPE Panel Recommendations, (1993) (unpublished material, on file at the Environmental Law Institute).

¹¹³ 58 Fed. Reg. 19097, 19102 (April 12, 1994).

Instead of making radon-resistant construction techniques or performance standards apply universally, the requirements could be limited to high radon potential areas; such "hot spots" could be identified using the county-level radon potential maps developed by EPA in addition to any additional data collected by the state. EPA has taken this approach in its model standards, which call for the implementation of radon-resistive construction techniques in high risk areas only. New Jersey's radon-resistant new construction standards are also tied to high risk areas in the state. This approach has the advantage of targeting concentrated areas of known high risk, though it will exclude pockets of high radon potential that may exist in areas officially designated as medium and low radon potential.

Another way of promoting radon-resistant new construction would be to require the use of radon-resistant features as a condition of receiving federal, state or local assistance for the construction of new rental housing. "Assistance" could be defined broadly to include not only construction and operating loans, but also tax benefits.

E. Conclusion

Radon education targeted to tenants can be important in making tenants aware of their potential exposure to a serious environmental health hazard. Education alone, however, will not bring about widespread reduction of high radon levels in rental housing, particularly in rental properties that are home to lower income families. Instead, education should be used in conjunction with, and as a means of strengthening implementation of, laws that require acceptable radon levels in rental housing.

Tenants can seek judicial relief using legal doctrines that provide for a landlord's duty to repair. However, it remains to be seen whether existing legal doctrines and statutes that require landlords to provide safe rental housing will adequately address the problem of tenant exposure to high levels of radon. Policy makers can take action by developing legislation to address radon in new and existing rental properties. For *new rental construction*, legislation should require radon-resistant construction techniques in at least those areas designated as high radon potential zones. EPA and model code organizations should work to develop standard techniques that apply to buildings greater than three stories.

For *existing rental housing*, legislation should require owners to ensure that rental units contain acceptable radon levels. This can be done by requiring testing and mitigation either (a) by the owner/purchaser during the real estate transaction, or (b) by the landlord, in the context of the landlord-tenant relationship.

A law requiring owners/landlords to demonstrate acceptable radon levels could contain the following elements:

- an "acceptable" radon level (e.g., use of the EPA standard would help promote consistency among states), and criteria for demonstrating that the property meets that level, including requirements for using qualified testing and mitigation professionals and procedures.
- a date on which requirements take effect; the requirements should be phased in, beginning with properties that are located in high radon potential zones.
- disclosure of results; the results of any testing and mitigation should be disclosed to tenants and should be provided to the relevant public agency, provided that the agency treats the information as confidential.
- enforcement measures; enforcement resources could be targeted to high radon potential areas.

This last component -- enforcement -- is particularly important, given the historical difficulty in enforcing housing code requirements. Enforcement officials generally lack sufficient resources to carry out inspections and follow through on violations. Moreover, tenants armed with legal causes of action may nonetheless fail to exercise such legal remedies because they lack the resources to file a rent escrow or rent abatement action,¹¹⁴ or because they fear their leases may be terminated for asserting their legal rights.¹¹⁵

Even radon laws that incorporate implementation and enforcement provisions may be inadequate, standing alone, to address high radon levels in rental housing that is affordable to low income families. Legal requirements to mitigate high radon levels may lead to rent increases.¹¹⁶ Some properties could not provide sufficient rental income to support the costs of radon mitigation. As discussed below, to preserve affordable housing, radon risk reduction strategies should include some commitment of public resources to help ensure that compliance with legal mandates will not diminish the availability of low and moderate income housing in the community.

¹¹⁴ Indigent tenants can often obtain free legal services and a waiver of court fees. Many who do not qualify for these services cannot afford to hire a lawyer, however, and may have difficulty filing on their own.

¹¹⁵ In this regard, "retaliatory eviction" laws are important to protect tenants. Such laws generally prohibit a landlord from evicting a tenant when the reason for the eviction is the tenant's complaint or legal action against the landlord. Nonetheless, these laws only provide short term protection, and usually depend upon a court finding that the landlord had no other motive for evicting the tenant.

¹¹⁶ Rent control laws, currently in place in local jurisdictions in a number of states, provide some protection by limiting the amount by which rents can be increased. Even under such laws, however, landlords can generally petition for increases based on certain capital expenditures made to the property. Radon reduction might qualify as such an expenditure.

III. PROGRAMS ADDRESSING THE COST OF RADON MITIGATION IN RENTAL HOUSING

Public policy strategies are needed to provide financial assistance for carrying out radon risk reduction in affordable rental housing. Such strategies can be implemented alone, or in conjunction with the legal approaches described in the preceding section. Creating a financial assistance program for radon testing and mitigation requires not only establishing radon reduction in rental housing as a priority, but also creating mechanisms to fund such a program. At a time of shrinking budgets and program cutbacks, targeted funding for a radon reduction assistance program is critical. A state or local government might establish a special *surcharge* to fund an assistance program. For example, Florida has enacted legislation creating a surcharge on new construction and certain renovations, as a source of funding for its radon program. Another source of funding might be *fees*, such as those charged in connection with a state's licensing or certification of radon professionals. Also, any *finer or penalties* collected for violation of radon program requirements could be devoted to radon testing and mitigation assistance.

The initiatives described below are institutional measures that require both political will and time to develop and implement. Although some of the initiatives build on existing programs, some would require authorizing legislation as well as a commitment of public resources. These approaches can complement community based efforts to develop creative strategies for directing resources to discrete projects. The programs described here might also be used to help fund radon reduction for homeowners who are unable to afford the cost of mitigation.¹¹⁷

A. *Grants and Loans for Radon Risk Reduction*

Federal and state radon agencies have implemented successful programs to subsidize the cost of radon test devices to the public. Many states have used radon program funds to provide reduced cost test kits, and have worked with local retailers and local non-profit organizations to distribute kits. In addition, New York law makes financial assistance available "for the performance of radon diagnostic services and the preparation of specifications for appropriate, energy-efficient mitigation measures for one to four family residences."¹¹⁸

There is relatively little state and local government experience, however, in implementing programs to provide financial assistance for radon mitigation where testing reveals high levels. Federal and state legislatures should consider creating new programs, or drawing on existing

¹¹⁷ Some 4.9 million homeowners have household income below the poverty level. Housing in America, *supra* note 2, at 28.

¹¹⁸ Laws of New York, 1988, Chapter 239. This program is financed through energy overcharge funds, rather than directly through state revenues.

funding programs, to help owners or purchasers of affordable rental housing properties finance radon reduction.

1. Creation of a federal grants program

One approach to promoting radon reduction in rental housing is the establishment of a federal financial assistance program designed exclusively for this purpose. Such a program could provide grants, loans, loan guarantees or other assistance to owners of rental housing to test for and mitigate high radon levels.¹¹⁹ This assistance would be based on financial need, as measured by eligibility guidelines on owner income and should be tied to the continued affordability of the housing.

Federal lead poisoning legislation provides one model for this type of financial assistance program. Title X of the Housing and Community Development Act of 1992, the Residential Lead-Based Paint Hazard Reduction Act, authorizes a HUD competitive grants program for evaluation and reduction of lead-based paint hazards in private housing.¹²⁰ Grants may be given to state and local governments, which can use the funds in a variety of ways, including the award of grants, loans, loan guarantees and interest write-downs. Recipients must provide 10% matching funds.¹²¹ Title X specifies certain selection criteria, including the extent of lead-based paint hazards in the jurisdiction to be served under the proposed grant. It also sets out a list of eligible activities under the grant.

A radon risk reduction grants program could be similarly structured. The selection criteria could include a preference for areas that have been designated by EPA as high radon risk potential, or that have otherwise documented the existence of high radon levels in rental housing. Legislation could spell out the types of eligible activities, such as mitigation of buildings where testing reveals radon above a specified level. The program could require, as a condition of funding, that covered services be provided by radon professionals who have completed EPA's proficiency program or a state equivalent. The program should also require reporting of test results to tenants and to state and local radon agencies for purposes of data collection. Finally, a grants program could include a requirement that a percentage of funding provided to the jurisdiction be used in a way that promotes economic opportunities in the affected communities.¹²²

¹¹⁹ The legislation would probably adopt EPA's current action level of 4 pCi/L; unless scientific or technical information demonstrated that this level should be changed, policy makers would create considerable controversy by adopting a different standard for rental housing than was recommended for owner-occupied residences and other buildings.

¹²⁰ Public Law 102-550, §1011.

¹²¹ Public Law 102-550, §1011(h). To be eligible, recipients must also have an approved "Comprehensive Housing Affordability Strategy (CHAS)," as required under §105 of the Cranston-Gonzalez National Affordable Housing Act. §1011(b).

¹²² For example, the Baltimore Jobs in Energy project as well as Consumer Action's San Francisco Lead Poisoning Prevention Project have developed a project for using Title X funding to train unemployed community members to do interim lead control work.

2. Creation of a state radon assistance program

States could establish a radon grants program in much the same manner as the federal government. In addition to grants, state agencies could provide loans with interest subsidies based on financial need. State agencies that administer other housing-related loan programs could work with the state radon program to implement a radon low interest loan program. States could also administer loan programs together with a local bank willing to participate in the program.

Connecticut recently developed a program to make radon mitigation grants available to low income renters and homeowners. The state health agency is using part of its federal State Indoor Radon Grants (SIRG) program funding to operate the initiative as a demonstration project, and has contracted with the state housing agency to manage the project. The housing agency identifies financially disadvantaged owners or renters whose homes have high radon levels and processes the grant applications, which must ultimately be approved by the health agency. Grants are provided to cover the costs of radon mitigation, which must be performed by a contractor who has been approved under the state's certification and registration laws.¹²³

Although the current federal radon law urges states to give preference to low income persons in implementing radon mitigation programs, the SIRG program covers radon mitigation activities only as demonstration projects.¹²⁴ EPA should therefore promote the use of SIRG funding for other demonstration projects that focus on mitigation of affordable rental housing.¹²⁵

Nevertheless, states will be somewhat restricted in using SIRG funds to develop comprehensive financial assistance programs for radon risk reduction activities. To encourage the use of SIRG funds for such programs, Congress could broaden the SIRG program to explicitly cover a state's award of grants for radon testing and mitigation in rental housing. Congress could go further by requiring that states devote a portion of their SIRG funding to radon mitigation in rental housing, e.g., through a grants program. However, since most states are already seeking to accomplish a broad range of activities with limited funding, such a requirement would only be feasible if accompanied by an increase in federal funding for state radon programs.

¹²³ Telephone conversations with Connecticut Department of Health Services official (April 8, 1993 and August 10, 1993). The Department of Health Services administers the state's radon program.

Connecticut has also started a radon public education initiative targeted to Latino residents, particularly renters. The state will seek to make testing devices available through this project, and to connect potentially eligible households with the state's radon mitigation grants program. *Id.*

¹²⁴ 15 U.S.C. §2666(c)(9),(i)(2).

¹²⁵ For example, EPA could use its existing legislative authority to focus demonstration mitigation projects on developing efficient and cost-effective mitigation techniques for low income rental housing. The Act not only authorizes EPA to establish priority areas for funding state programs, but also states that "the Administrator should select homes of low-income persons, to the maximum extent practicable and consistent with the objectives of the demonstration." 15 U.S.C. §§ 2666(e), 2665(a)(6).

3. Application of related funding programs to radon risk reduction activities

Another vehicle for providing financial assistance for radon mitigation is through already existing programs that provide funding for related activities. Housing and community development programs, for example, provide extensive funding to preserve and rehabilitate affordable housing. Radon testing and mitigation could be made eligible activities under such programs; or, federal and state programs could go further by requiring acceptable radon levels in connection with any funded rehabilitation projects.

Two federal programs that are potentially applicable to the radon reduction context -- HUD's Community Development Block Grant and HOME Investment Partnership programs -- are described below, as are analogous state programs that could be used to fund a state initiative. In addition to these, federal agencies such as HUD, the Veterans Administration and the Department of Agriculture have housing programs that could incorporate radon testing mitigation. Federal programs in areas other than housing -- e.g., the health-related programs of the Department of Health and Human Services or the training programs of the Department of Labor -- might also be appropriate vehicles for funding radon testing and mitigation.

a. Community Development Block Grant Program

The Community Development Block Grant (CDBG) program is the most widely used federal housing and community development program.¹²⁶ It aims to "provide decent housing and a suitable living environment and [greater] economic activities."¹²⁷ State and local governments receive funds according to a federal formula, and allocate the funds to local agencies; the local agencies may, in turn, make funds available to individual households or to community organizations.

Among the activities for which local agencies may use CDBG funds are housing code enforcement and rehabilitation of residential housing, provided that 75% of such activities involve low and moderate income housing. CDBG recipients could consider making radon mitigation an explicit priority area, as part of the recipient's general program for rehabilitation of affordable housing. In addition, if acceptable radon levels were incorporated into the relevant housing code, a CDBG recipient could include radon testing and mitigation as part of its activities to bring affordable housing up to code.

In order to encourage states to use community development money to fund radon reduction in rental housing, HUD could notify recipients that radon testing and mitigation are eligible activities. Congress could go a step further by amending the CDBG legislation to explicitly include radon testing and mitigation as a separate category of covered activities and to

¹²⁶ 42 U.S.C. §5301 *et seq.*

¹²⁷ *Id.* at §5301(c). In administering the CDBG program, the Secretary of HUD must require, to the extent possible, that opportunities for training and employment in connection with funded projects be made available to low income persons living in the project area. 12 U.S.C. §1701u.

provide additional funding for those activities. To target limited resources, HUD could consider high radon potential areas as a priority for this funding. If additional funding were provided, Congress could consider requiring, as a condition of receiving funding, that recipients demonstrate how they plan to address radon in low and moderate income housing. This requirement already exists in the lead-based paint context; in order to receive CDBG funding, jurisdictions must indicate how they plan to address lead-based paint hazards.

b. HOME Investment Partnership Program

The HOME Investment Partnership (HOME) program is a federal initiative that makes grants available to states, large cities and urban counties. These grants, which require local matching funds, can be used to subsidize the development of low or very low income housing, including rehabilitation or site improvements.¹²⁸ Therefore, states and municipalities might include radon mitigation as part of broader rental housing rehabilitation projects to "preserve" affordable housing, when seeking funds under the HOME program. As with the CDBG program, HUD and Congress could take affirmative steps to encourage recipients of HOME funding to undertake radon testing and mitigation.

c. Existing state programs

States might similarly expand existing programs in areas such as housing and community development or energy efficiency, depending on the scope of those programs. Many programs already exist on the state level to make low interest loans or grants available for such activities as rehabilitation, energy conservation, and basic habitability of rental and owner-occupied housing. Often the owner and/or tenants must be income-eligible. Where existing programs are structured to exclude activities like radon mitigation states might consider legislative changes to include radon testing and mitigation as permissible uses of such assistance.

B. Tax Credits

One way to encourage radon testing and mitigation in rental housing would be through an income tax credit for rental property owners. A tax credit could be enacted at the federal or state level, depending on state tax law. For example, Massachusetts law provides a tax credit for lead-based paint abatement.

In the radon context, legislation could allow owners of low income rental housing a tax credit for the total dollar amount paid for radon mitigation in a rental building or for a percentage of the actual radon reduction costs, up to a certain amount. A tax credit program should specify the type of rental property that qualifies as well as the nature of radon-related services covered, and should require documentation of radon test results in excess of a given level. Owners should

¹²⁸ See 24 C.F.R. §92.205.

be required to demonstrate that mitigation services were provided by a professional who has been approved by the state or has participated in EPA's proficiency program.

A tax credit or tax deduction might also be provided to radon professionals who make radon-related services available to low-income rental buildings for free or at reduced cost. Such legislation would need to specify in detail the types of services that would qualify for the credit.

C. Direct Assistance

In addition to providing financial assistance for radon mitigation, states could establish programs to provide mitigation services directly to eligible households. To date, most direct assistance programs have involved the distribution of free or reduced cost radon test devices. Federal law specifically allows SIRG funds to be used by states to purchase radon measurement devices. Numerous state and local radon programs have subsidized the cost of radon test kits and have worked with community organizations and local retailers to make these kits available to the public. The state of Washington has addressed radon testing in new residential construction by enacting a law requiring building inspectors to deliver a radon testing kit to all new residences at the time of building inspection.¹²⁹

States can ensure that their radon testing initiatives extend to rental housing as well as owner-occupied homes, and can give greater consideration to providing radon mitigation services. One potential model for such a direct assistance program is the federal Weatherization Assistance Program.

The federal government, through the Department of Energy, funds the Weatherization Assistance Program (WAP), which provides weatherization services to low income rental and owner-occupied households.¹³⁰ States receive federal WAP funding to establish weatherization programs through local community-based organizations and agencies. Qualified households receive in-kind services such as replacement or repair of doors and windows. Owners of rental property must consent to receiving the services, and must agree that "the rents on such dwelling units will not be raised because of any increase in the value thereof due solely to weatherization assistance provided [under WAP]. . . ." ¹³¹

A radon mitigation services program could be modeled on the weatherization program. Like WAP, it would provide direct home repairs in non-subsidized rental buildings, and would

¹²⁹ Washington Substitute Senate Bill 6386; Chap. 132, Laws of 1992.

¹³⁰ 42 U.S.C. §6861 *et seq.*

¹³¹ *Id.* at §6863(b)(2)(B). This prohibition reflects the legislative goal that weatherization services in rental units are to accrue primarily to the benefit of low income tenants. The Department of Energy recently promulgated regulations implementing the statutory provision. 58 Fed. Reg. 12528 (March 4, 1993); 10 C.F.R. §440.22(b)(3). Although the limitation on rent increases directly addresses the issue of preserving and enhancing affordable housing, the measure has been criticized as being too vague to implement effectively. See, e.g., National Consumer Law Center, "Protection of Renters in the Weatherization of Low-Income Housing" (1987).

target low income renters. Key elements of the program would be the use of financial eligibility guidelines and restrictions on increases in rent levels following the provision of services.

As an alternative to creating a wholly new program for providing radon mitigation services to low income homes, states should consider expanding the work done through existing weatherization providers to include radon testing and mitigation services. Once a dwelling is selected for weatherization services, the WAP subgrantee could test the home for radon; if high levels were found, radon mitigation measures could be provided in addition to weatherization services. Radon mitigation could also be provided to homes independent of whether any weatherization services were also being provided. Such an approach would only be feasible if adequate additional funding was provided to cover the radon-related work.

The current weatherization law itself envisions the possibility of addressing other, non-energy related problems.¹³² The Department of Energy recently adopted regulations that require states to develop procedures to ensure that subgrantees address health and safety concerns related to weatherization. The regulations call on states to develop a list of energy-related health and safety hazards, including permissible abatement materials and their costs.¹³³ The new WAP regulations expand the list of allowable expenditures to include "the cost of eliminating health and safety hazards elimination of which is necessary before, or because of, installation of weatherization materials."¹³⁴ The Department of Energy has issued an interim guidance document on the types of health and safety hazards that may be considered. The guidance document encourages procedures that would allow for radon testing where radon potential is high. However, the guidance would limit the use of weatherization funds for mitigation to circumstances where "an energy audit indicated weatherization techniques that help in abatement."¹³⁵

The critical issue in coordinating weatherization services with radon testing and mitigation is whether radon costs can be covered without displacing already limited funding for weatherization services. The WAP program places a limit on expenditures per dwelling. The regulations also require grantees to establish a limitation on the percentage of average dwelling unit costs that can be used to abate energy-related health and safety hazards.¹³⁶ The DOE comments accompanying the new regulations note that states are expected to "limit such expenditures for non-weatherization materials to a *reasonable* percent of average dwelling unit

¹³² The law was amended in 1990, and now aims to achieve "a balance of a healthful dwelling environment and maximum practicable energy conservation." 42 U.S.C. §6863(b)(2)(A). This statutory language reflects Congress' concern that "many of the dwellings that receive weatherization assistance have other non-energy related problems or defects which threaten the health or safety of the occupants of the dwelling." 1990 U.S. Code Congressional and Administrative News, 1659.

¹³³ 10 C.F.R. §440.16(h).

¹³⁴ 10 C.F.R. §440.18(c)(15).

Some commentators have suggested that weatherization activities may have an exacerbating effect on high radon levels, because measures to enhance energy efficiency in homes may further reduce the indoor/outdoor air exchange rate, preventing radon from escaping. See, e.g., General Accounting Office, Air Pollution: Hazards of Indoor Radon Could Pose a National Health Problem (June, 1986); J. Cook & D. Egan, Jr., "Mitigation" in *Environmental Radon*, *supra* note 6, at 255. There does not appear to be consensus on this issue, however, and EPA is currently undertaking further research to explore the relationship between weatherization activities and radon levels.

¹³⁵ Department of Energy, Weatherization Program Notice 93-13 (Dec. 29, 1993).

¹³⁶ 10 C.F.R. §440.16(h)(2).

costs in light of the primary energy conservation purposes of WAP."¹³⁷ The DOE also points out that legislative history of the 1990 Act indicates that the House of Representatives anticipated that WAP subgrantees would seek other funding sources to pay for non-energy-related health and safety repairs.¹³⁸

It is necessary, therefore, to supplement WAP funding in order to link weatherization and radon mitigation. One way to do so would be to use radon program funds to pay for some or all of the radon testing and mitigation costs. If radon testing and mitigation in low income rental housing is a priority for a radon program, the weatherization program may already have the capacity to implement the initiative. WAP subgrantees have experience managing the type of work that would be undertaken in performing radon mitigation. In addition, weatherization offices work with low-income families and would be able to provide effective outreach to low income communities for carrying out radon-related services. Because WAP offers an existing institutional structure for providing radon mitigation in low income housing, the cost of setting up a radon testing and mitigation project may be lower than if a wholly new entity were created.

The state of New York recently experimented with the use of weatherization offices to carry out radon mitigation. The state health agency used SIRG money to fund local weatherization offices to provide radon mitigation to low income families. The local weatherization subgrantees conducted outreach to identify owners of low income housing who were interested in participating in the program, tested the buildings, and arranged for mitigation of those buildings that contained radon levels over 4 pCi/L. SIRG funding was provided to cover mitigation costs, and the project made use of existing state programs that provide radon testing and diagnosis. The New York program concluded that it is feasible and appropriate to use weatherization program offices to perform radon mitigation for low income households.¹³⁹

To enable state radon agencies to fund radon mitigation either modeled on, or in conjunction with, weatherization programs, federal law could be amended to add such activities to the list of allowable expenditures under the SIRG program. Given the already limited budgets of most state radon programs, increased federal funding would have to be provided in addition to legislative authority. Federal funding for radon reduction activities could also be provided to the WAP program directly. In addition, federal law could be amended to require coordination between EPA and DOE on information and technical assistance necessary to most effectively incorporate a radon risk reduction component in the weatherization program.

¹³⁷ 58 Fed. Reg. 12517 (March 4, 1993).

¹³⁸ *Id.* The House Report on the legislation states that "(i)t would be a simple matter for these local program operators to do additional health and safety repairs at the same time they do the weatherization improvements, if they had additional non-energy funding. The Committee urges the Secretary [of Energy] to work with the Secretary of HUD and with state and local agencies in a demonstration of a more comprehensive housing repair program." 1990 U.S. Code Congressional and Administrative News, 1659.

¹³⁹ Telephone conversation with New York Department of State official (July 1, 1993).

D. Facilitating "self-help" radon mitigation in rental housing

Some rental housing owners who are unable or unwilling to hire a professional radon contractor will be interested in performing radon mitigation work themselves. A radon program may be able to promote radon reduction in rental housing by facilitating effective do-it-yourself mitigation activities. There are important reasons for considering programs to help owners do mitigation work on their own properties. In some parts of the country, particularly rural areas, it may be difficult to obtain the services of a professional radon contractor. Some small landlords may find that the cost of hiring a radon contractor is prohibitive in relation to the value of their property. Moreover, some owners are accustomed to doing their own major home repairs, or have built their own homes, and believe that they can do radon mitigation work themselves whether or not such an approach is officially sanctioned. Conversely, the mere fact that there is information available on self-help radon mitigation techniques is unlikely to persuade those who are not already so inclined to do the work themselves.

There are a number of drawbacks to encouraging self-help in this area. First, there are potential health and safety considerations involved with radon mitigation, such as exposure to asbestos, formaldehyde and other hazards. For these reasons, any agency or organization seeking to provide guidance on self help must ensure that the guidance adequately addresses any issues that might affect the safety of owners (mitigators) and of residents. Second, self-help may not be appropriate for larger buildings, where mitigation techniques have not been widely tested. Therefore, public policy in this area might be better directed to single family rental homes or small, multifamily buildings. Finally, there is a concern that individuals who have not been specially trained in radon mitigation may do an ineffective job. If this is the case, then program resources might be better spent on other mitigation initiatives. However, there has been little emphasis on self-help to date, and little data collected on the success of do-it-yourself efforts. Any guidance in this area should include retesting of the home following mitigation to ensure that radon levels have been lowered. This guidance could specify inspection of a home owner-installed system by a professional who has successfully completed EPA's Radon Contractor Proficiency (RCP) program, or by a building inspector.

Wyoming's state radon program has created a project to train and assist owners interested in mitigating their property by reducing radon entry from soil.¹⁴⁰ Together with Colorado Vintage Companies, Inc., the radon program developed a one-day seminar on mitigation techniques that do not require a higher level of skill than that of an experienced "do-it-yourselfer." The course emphasized occupational safety issues and was designed to alert participants to the range of potential situations that might be encountered while performing radon mitigation. The pilot seminar was held in April, 1993 and was attended by 11 people whose homes had tested above 20 pCi/L. Of the 11, three decided after attending the course that they would hire a professional radon contractor to do the mitigation. For those who will undertake the mitigation on their own, the radon program provides a free long term radon testing device to

¹⁴⁰ The information on Wyoming's program is based on a telephone conversation with Wyoming Department of Health officials (June 29, 1993).

measure the results. One participant indicated that he would also mitigate rental property he owns that tested above 4 pCi/L. A workbook has been developed to be used in conjunction with future workshops; the book describes those mitigation situations that should be handled by a professional contractor rather than a property owner.¹⁴¹

Depending on the number of owners who indicate interest in taking the steps necessary to effectively and safely mitigate their own property, a particular radon program can determine whether or not it should invest in facilitating self-help mitigation. If such a project is undertaken, radon program officials should determine carefully the circumstances in which do-it-yourself approaches are appropriate. Because of the safety issues related to radon mitigation, as well as the skill level involved, any efforts to facilitate self-help mitigation should include education that thoroughly addresses these factors. A radon program could provide a training program similar to that undertaken in Wyoming and could waive any fees involved for participants who own affordable rental housing. The program could further encourage the use of an RCP-listed diagnostician to provide a mitigation plan and answer questions.

In addition, a radon program could promote more effective self-help mitigation by

- exempting owners who undertake radon mitigation of their property from certification or licensing requirements. Such an exemption should be conditioned on attending a workshop or obtaining some other form of training.
- establishing a program with local retailers to facilitate and/or subsidize the purchase of appropriate materials for radon reduction.
- creating a program to subsidize a local agency or organization that can provide or lend to owners of affordable housing the materials necessary to undertake mitigation.

IV. CONCLUSION: Using Legal Requirements and Financial Assistance Programs to Reduce Radon Risks in Rental Housing

Research to date demonstrates that people who are exposed to high indoor radon levels over time face a considerable risk of developing cancer. Public and private agencies have made great strides in educating citizens about radon generally, but much work remains to be done to broaden public awareness and achieve greater radon testing and mitigation of high radon levels. Although home owners represent the largest group that is potentially at risk from residential exposure to radon, tenants across the country also are being exposed to high radon levels. This facet of the problem presents a more complex challenge for policy makers who seek to design effective radon risk reduction strategies.

¹⁴¹ Colorado Vintage Companies, Inc., Protecting Your Home From Radon: A step-by-step manual for the do-it-yourselfer (1993).

This paper has argued that both legal requirements and financial assistance programs need to be developed to promote radon testing and mitigation in rental housing. While education remains a vital component of a radon program, simply informing tenants that they may be exposed to high radon levels is a poor strategy if the tenants have no viable options for remedying the problem.

Legal requirements are an important component in a strategy for reducing high radon levels in rental housing. Although tenants can pursue existing legal claims, such as under the warranty of habitability, explicit legislative measures are needed to define clearly the responsibility for addressing radon problems.

States seeking to ensure that radon problems in rental housing are addressed can target radon education to landlords and tenants, and can establish the following legal requirements:

- a duty to test for, disclose and mitigate high radon levels, either (a) by owners/purchasers during the real estate transaction or (b) by landlords in the context of the landlord-tenant relationship; and
- building codes applicable to rental premises, which incorporate radon-resistant construction features.

States might take a more limited approach to adopting such requirements, by making them applicable only to property located in areas identified as high radon potential zones. This serves to target action to areas believed to contain the greatest numbers of homes with high radon levels, however the approach has certain drawbacks. First, it misses those properties that have high radon levels, but that are located in low or moderate radon potential areas. Second, it requires continuous changes in implementation strategies to incorporate changes in mapping of radon potential zones. Third, it might create the implication that owners of properties outside high radon potential zones need not worry about radon, and therefore need not test. A preferable approach would be to phase in requirements, beginning with properties located in high radon potential zones at the time the law is enacted, and to target enforcement to high radon potential zones.

While regulation of landlord-tenant matters and building codes are traditionally left to state legislatures, the federal government can facilitate state legislative initiatives in a number of ways. It can develop technical information relating to radon resistant-construction and radon mitigation in large buildings, and can condition federal assistance for new construction on the use of radon-resistant techniques. The federal radon program can also promote radon education initiatives directed to tenants. Finally, the current voluntary proficiency programs could be expanded and made mandatory, in order to help ensure that there are qualified professionals to perform radon testing and mitigation in rental housing.

Although legal requirements alone may result in radon testing and mitigation in a portion of the rental housing market, additional measures are necessary in order to accomplish radon testing and mitigation while preserving housing that is affordable to lower income families.

Federal, state and local agencies can build on existing programs and create new programs to provide financial assistance for radon testing and mitigation. These might include:

- grants and loans;
- tax credits;
- testing and mitigation services; and
- training and materials for self-help mitigation.

This paper has suggested some legal and policy tools for addressing the problem of radon in rental housing. There are many other steps that can be encouraged -- e.g., adjustment of real estate appraisal guidelines -- and creative initiatives that can be developed by individual communities based on their needs and resources -- e.g., a radon professionals' "pro-bono" radon assistance program for lower income families. Regardless of the specific mechanisms chosen, concerted efforts must be made in order to reduce the risk of exposure to high radon levels in rental housing. This will require that federal, state and local governments, as well as the private sector, move from a general public education-oriented strategy to a more focused approach that takes into account the differences between rental housing and owner-occupied housing and that affirmatively seeks to preserve affordable housing.