U.S. DEPARTMENT OF HOUSING AND URBAN DEVELOPMENT
WASHINGTON, DC 20410-7000

OFFICE OF COMMUNITY PLANNING
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SUBJECT: Departmental Policy for Addressing Radon in the Environmental Review Process

I. Purpose

The purpose of this Notice is to clarify that radon must be considered in the contamination analysis for 24 CFR Parts 50 or 58, as applicable; to provide guidance on recommended best practices for considering radon; and to identify the U.S. Department of Housing and Urban Development (HUD) programs that have established specific radon guidance. This Notice does not impose radon testing requirements; however, it does include guidance on strategies for considering radon in the site contamination analysis. HUD is considering rulemaking to establish radon testing and mitigation requirements for HUD-assisted projects.

II. Radon and its health effects

Radon is a radioactive gas that forms when radium and certain other radioactive metals break down in rocks, soil, and water.[1] It is found in nearly all soils and moves through the soil to the air and into structures through cracks and other areas of permeability. Building materials and groundwater may also be a source of indoor radon. Once inside, radon concentrations can build to high levels, regardless of the age, condition, or design of the building.

[1] National Institute of Health, Periodic Table, Element Summary, "Radon", https://pubchem.ncbi.nlm.nih.gov/element/Radon.

The most common pathway for human exposure to radon is inhalation indoors. When inhaled, some radon gas remains trapped in the lungs, and sensitive lung tissue can be exposed to radiation as it decays. Radon is the number one cause of lung cancer in non-smokers and the second leading cause of lung cancer overall.[2] The risk of adverse health effects from radon in indoor air depends largely on two main variables: the level of radon exposure and the length of time exposed. Many radon-induced lung cancers can be prevented by testing and reducing radon levels in existing buildings and by using radon resistant construction techniques for all new construction.[3]

The goal for mitigating radon in buildings is to reduce radon concentrations in indoor air as low as reasonably achievable and practicable considering the efficacy of current industry-standard radon reduction systems and environmental conditions (e.g., geology and climate). The most effective strategy to protect the health and safety of occupants is to prevent radon from entering the building by using radon resistant construction techniques; another effective strategy is to reduce the level of radon inside existing buildings by installing and operating a radon reduction system. An effective radon reduction system achieves two main goals: it reduces the concentration of radon gas in the home by venting it safely outside the structure and removes the radon gas from under the foundation before it can come into the home.

III. Considering radon in the environmental review

HUD's environmental regulations at 24 CFR 58.5(i)(2)(i) and (ii)[4] state that,

> [i]t is HUD's policy that all properties that are being proposed for use in HUD programs **be free of hazardous materials, contamination, toxic chemicals and gases, and radioactive substances**, where a hazard could affect the health and safety of occupants or conflict with the intended utilization of the property.
>
> The environmental review of multifamily housing . . . , **must include the evaluation of** . . . other evidence of contamination on or near the site, to ensure that occupants of proposed sites are not adversely affected by any of the hazards listed in paragraph (i)(2)(i) of this section.

As radon is a radioactive substance, HUD or the responsible entity (RE) must consider it as part of the site contamination analysis for projects that:

- Require an environmental review at the level of *Categorically Excluded Subject to 50.4 or 58.5* ("CEST"), *Environmental Assessment*, or *Environmental Impact Statement*; and

[2] U.S. Environmental Protection Agency, "Health Risk of Radon", https://www.epa.gov/radon/health-risk-radon.
[3] https://www.epa.gov/radon/health-risk-radon.
[4] HUD's contamination policy at 24 CFR 50.3(i)(1) and (2) implements the same substantive policy with slightly different text, https://www.ecfr.gov/current/title-24/subtitle-A/part-50/subpart-A/section-50.3.

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- Involve structures that are occupied or are intended to be occupied at least four (4) hours a day.
- HUD's contamination policy does not apply to projects that are Categorically Excluded Not Subject to 50.4 or 58.5 ("CENST")

HUD encourages environmental review preparers to follow the most recent U.S. Environmental Protection Agency (EPA) recommendations about assessing the health risk from radon exposure and when to reduce radon levels in indoor air. For the purpose of risk comparison the average radon concentration in outdoor air is 0.04 pCi/L and the average radon concentration level in indoor air in buildings in the United States (U.S.) is 1.3 pCi/L.[5] Because more people are exposed to moderate levels of radon most radon-induced lung cancer results from long-term exposure to low or moderate radon levels in the home.[6] The EPA recommends homeowners/property owners consider mitigating indoor radon levels that measure between 2 pCi/L and 4 pCi/L and recommends reducing radon levels that are at or above 4 pCi/L. Indoor air radon levels vary across the U.S. and from parcel to parcel due to differences in geology, climate, seasonal variation, building construction, and other conditions. Additionally, because radon cannot be seen, tasted, or smelled, the only method for determining the precise radon level in a specific building is to test the indoor air.

Exemptions from further radon consideration:

- Buildings with no ground contact and open air between the ground and the building.
- Buildings that are not residential and will not be occupied for more than 4 hours per day.
- Buildings with existing radon mitigation systems - document radon levels are below 4 pCi/L[7] with test results dated within one year prior to submitting the application for HUD assistance and document the system includes an ongoing maintenance plan that includes periodic testing to ensure the system continues to meet the current EPA recommended levels. If the project does not require an application, document test results dated within one year prior to the date the environmental review is certified. Refer to program office guidance to ensure compliance with program requirements.
- Buildings without existing radon mitigation systems, tested within one year prior to the submission of the application for HUD assistance: test results document indoor radon levels are below the EPA's current recommended action levels of 4 pCi/L.

a. Best practice for considering radon in the contamination analysis

When considering radon in the contamination analysis, HUD recommends using the American National Standards Institute/American Association of Radon Scientists and Technologists (ANSI/AARST) radon testing standards for single- and multi- family buildings, schools, and large buildings.[8] The ANSI/AARST standard describes how to conduct testing,

[5] The EPA charts compare the risk of cancer from radon exposure to other health risks, https://www.epa.gov/radon/health-risk-radon.
[6] World Health Organization, *Handbook on Indoor Radon; A Public Health Perspective* (January 1, 2009). p. x, 2, https://www.who.int/publications/i/item/9789241547673.
[7] Or the EPA's current recommended level for reducing radon levels in indoor air, https://www.epa.gov/radon/health-risk-radon.
[8] ANSI/AARST Standards (In lieu of developing a federal radon testing standard, the EPA references the ANSI/AARST Standards), https://standards.aarst.org/ (https://www.epa.gov/radon/radon-standards-practice).

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interpret test results, and draft a Radon Test Report to document process for the building owner (and to use as documentation for the Environmental Review Record (ERR)).

The ANSI/AARST standards can be viewed online for free and are intended to be implemented by licensed radon professionals. To find a licensed radon professional in your area contact the State/Tribe's radon program office,[9] National Radon Proficiency Program (NRPP),[10] or the National Radon Safety Board (NRSB).[11]

Contact the State/Tribal radon office or health department to ensure the project complies with State/Tribal requirements.[12] Where requirements conflict, follow the requirement most protective of human health.

b. Alternative strategies for considering radon levels at a project site

At this time using the ANSI/AARST radon testing standards is not the only strategy for considering the risk that occupants may be exposed to high radon levels.[13] Where radon testing is not feasible, the following alternative strategies[14] may be used to consider radon. Review the HUD program office guidance in Section IV to ensure the strategy used to consider radon in the contamination analysis complies with specific program office requirements for the project.

i. Do-it-yourself (DIY) radon test kits may be used to measure radon levels in single-family dwellings or by tenants or owners to test individual units in multifamily buildings. For example, a DIY test kit may be used to test one or all the units in a four-plex residential building. DIY radon test kits may be available for low or no cost through State/Tribal radon program offices and are available to purchase through the National Radon Program Services website (low cost).[15]

When using a DIY test kit, there can be quality control issues that affect the quality of the test results. To ensure the DIY test results are as accurate as possible it is important to read the entire test kit instructions before activating the test device. The EPA's *Citizen's Guide to Radon*[16] and the ANSI/AARST standard for testing single-family housing are excellent resources for detailed instructions about conducting the radon test, including where to place the test device(s), how to prepare the home (whether to close the windows, turn off fans, the length of time to test), how to document the test process, and how to interpret the results. Use a test device that is recommended by the National Radon Services Program, the EPA[17] or your State/Tribe radon program office.

[9] The National Radon Services Program, "State Radon Programs Information", https://sosradon.org/state.
[10] NRPP, https://nrpp.info.
[11] NRSB, https://www.nrsb.org.
[12] https://sosradon.org/state.
[13] High levels of radon are those that are at or above 4 pCi/L.
[14] Alternative to measuring radon levels in indoor air using the ANSI/AARST standards.
[15] National Radon Program Services, https://sosradon.org/purchase-kits.
[16] EPA, *A Citizen's Guide to Radon: The Guide to Protecting Yourself and Your Family from Radon* (EPA 402/K-12/002, December 2016), https://www.epa.gov/radon/publications-about-radon.
[17] EPA, https://www.epa.gov/radon/find-radon-test-kit-or-measurement-and-mitigation-professional.

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Contact the National Radon Services Program helpline, the State/Tribal radon program office or the local health department or contact for assistance.[18]

ii. In remote areas where there are no trained radon professionals, the local government may decide to purchase radon monitoring equipment and train staff to use it.

iii. Scientific data review. The EPA Map of Radon Zones by U.S. County[19] may be used in combination with other available science-based information to determine whether the project site is located in an area identified as having a high potential for elevated radon levels. Contact the State/Tribal radon program office (or health department), as needed, for assistance with obtaining and interpreting available science-based information about radon levels in the area. Science-based information includes, but is not limited to:

1. State/Tribe-generated radon information, such as surveys of radon levels from collecting radon measurement data or geological studies that identify high risk areas.
2. Department of Health and Human Services, Centers for Disease Control and Prevention (CDC), National Environmental Public Health Tracking, Radon Testing map.[20] This map provides radon test data from national radon testing laboratories and states that can be viewed by state or county. Radon test data ranges from 1988 to the present.
3. EPA's radon map and state specific geologic studies undertaken for the purposes of developing the radon map. The studies may provide more detailed information about specific areas of the state. The EPA map was developed in 1993 using geology, aerial radioactivity, and soil parameters.

The goal of reviewing the EPA map in combination with other available science-based information is to develop an informed decision on whether the project site is located in area that may be impacted by high radon levels. Note the following limitation when using maps and other data about area-wide radon levels: although science-based, a document review does not determine the radon level in a specific building; where feasible, HUD recommends using one of the radon testing strategies.[21]

c. Mitigating Radon

When radon testing determines indoor air radon levels are at or above 4 piC/L or the scientific data review determines the project site is located in an area impacted by high radon levels, the Environmental Review Record (ERR) must include a mitigation plan. When the

[18] The National Radon Program Services, which has phone, email, and mail connections, is operated by Kansas State University for the US EPA, https://sosradon.org/Contact. (The phone numbers may also be reached by persons with hearing or speech difficulties by dialing 711 via teletype (TTY) or telecommunications device for the deaf (TDD)).
[19] "Information about EPA Map of Radon Zones", https://www.epa.gov/radon/epa-map-radon-zones-and-supplemental-information.
[20] CDC, "National Environmental Public Health Tracking, Radon Testing", https://www.cdc.gov/nceh/tracking/topics/RadonTesting.htm.
[21] For example, the EPA radon map was developed and is intended to help governments and other organizations target risk reduction activities and resources. https://www.epa.gov/radon/epa-maps-radon-zones-and-supporting-documents-state.

determination is based on a scientific data review, if feasible, HUD recommends conducting radon testing (using one of the testing strategies described in the previous sections) to confirm radon levels in the building(s) proposed for HUD funding.

The mitigation plan[22] must identify the radon level; consider the risk to occupants' health; describe the radon reduction system that will be installed; establish an ongoing maintenance plan to ensure the system is operating as intended; establish a reasonable timeframe for implementation (e.g., integrate radon mitigation activities into an annual plan or a 5-year plan that is already completed for HUD funded activities); and require post-installation testing by a licensed radon professional, where feasible. In an area where there are no licensed radon professionals, there may be other personnel, such as trained staff or other professionals (i.e., engineers, geologist, scientists, public health staff), who have experience conducting radon testing or have the relevant skills and knowledge to follow the device instructions or ANSI/AARST test protocols and mitigation standards. For assistance Contact the EPA's local radon program office, state/tribe radon program office, or the National Radon Program Services,[23] or refer to the applicable ANSI/AARST standard for guidance.

If using the ANSI/AARST mitigation standard to install the radon reduction system, follow the guidance in the standard to draft the mitigation and the operation, maintenance, and monitoring Plans.

d. Documenting the environmental review record

Under HUD's regulations, 24 CFR 58.38(a)(3) or 50.11, HUD, or the RE is required to document the radon evaluation as part of the contamination analysis in the ERR. For ERRs documented using the HUD Environmental Review Online System (HEROS), document the radon evaluation in the Contamination and Toxic Substances factor Compliance Determination screen and upload supporting documentation. Office of Housing projects use the Housing Requirements screen for Housing programs. Examples of documenting radon consideration in the ERR includes:

- ANSI/AARST standard: Include a copy of the test report and mitigation plan (if applicable) as described in the standard in the ERR. For Office of Housing programs, follow program guidance requirements on timing and documentation.

- DIY and other radon test strategies: Document the test device, time period of test, test conditions (HVAC system off, windows closed, outside temperature), test results, and other conditions relevant to test conditions. Refer to the applicable ANSI/AARST standard as guidance.

- EPA/CDC map review, geologic studies, other scientific data: Describe and cite to the maps and data used to determine the area wide radon levels and include copies of all supporting documentation (maps/studies) in the ERR.

[22] Example of an areawide radon testing plan: Home Forward, Multnomah County, Oregon at: http://homeforward.org/content/radon-information.
[23] EPA Regional, State, and Tribal Radon contacts, https://www.epa.gov/radon/epa-map-radon-zones-and-supplemental-information#datainfo; National Radon Program Services, https://sosradon.org/main or 800 644-6999.

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ERR Examples describing how radon was considered:

- The project is located in EPA Zone 1, State test results data for properties located in the neighborhood show radon levels above 5 pCi/L. In its 5-Year Housing Plan the City has targeted this neighborhood for homeowner rehabilitation assistance and will incorporate radon testing into project activities. Mitigation plans will be developed site by site depending on test results.

- The project is located Zone 3 on the EPA state map, an area identified as low potential for elevated radon risk. There is no other available evidence of radon levels in the area. The local government establishes a radon testing plan to confirm radon levels in specific buildings are below 4 pCi/L. The test plan timeframe aligns with the RE's housing rehabilitation plan.

The local EPA radon contact person and the National Radon Services Program may be able to assist with developing a testing plan. The EPA's *A Citizen's Guide to Radon* (for single family homes) and the ANSI/AARST standards (single family and multifamily buildings) are a good source for guidance on the information that is included in a test plan.

Note: Where radon testing is not performed at the site, HUD or a Responsible Entity must reject projects in areas where consideration has indicated there is a high risk of radon and no mitigation has been proposed or performed. HUD or a Responsible Entity must also reject a project when testing shows radon levels above 4 pCi/L and no mitigation has been proposed or performed.

IV. HUD program office documents addressing radon

Current HUD program office guidance regarding radon testing and mitigation is listed below. Each HUD program office is responsible for issuing program-specific radon guidance. Program guidance may be updated as Departmental policies develop; be sure to use the most current guidance. For questions concerning program office guidance, contact your program office representative.

- Office of Housing, *Multifamily Housing, Multifamily Accelerated Processing Guide* (4430.G), Section 9.6.3, https://www.hud.gov/program_offices/administration/hudclips/guidebooks/hsg-gb4430
- Office of Housing, Office of Residential Care Facilities, *Healthcare Mortgage Insurance Program Handbook* (4232.1), Section 7.8, Rev-1), or most recent edition, https://www.hud.gov/sites/documents/42321S2C7HSGH.PDF
- Office of Housing, Office of Recapitalization, Rental Assistance Demonstration (RAD) Program (Notice H-2019-09 PIH-2019-23 (HA)) and Supplemental guidance, https://www.hud.gov/RAD/library/notices
    - Quick Reference Guide, Environmental Review Requirements for RAD Conversions (2020), https://www.hudexchange.info/resource/4216/environmental-review-requirements-for-rad-transactions/. Check RAD Resource Desk for future guidance, https://www.radresource.net/index.cfm

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- Office of Public and Indian Housing (PIH), Radon Information for PIH Programs (Notice 2013-06 (HA)), https://www.hud.gov/sites/documents/PIH2013-06.PDF and https://www.hudexchange.info/programs/radon/

V. Resources

- EPA radon website, https://www.epa.gov/radon
  - EPA radon map: https://www.epa.gov/radon/epa-map-radon-zones-and-supplemental-information#radonmap
- National Radon Program Services, https://sosradon.org/
  - Helpline: 1-800-557-2366
  - Comprehensive radon information, links to state radon programs and radon testing and mitigation information, and access to radon helplines
- CDC, National Center for Environmental Health, "Radon", https://www.cdc.gov/radon/
  - NCEH map: https://www.cdc.gov/nceh/tracking/topics/RadonTesting.htm
- ANSI/AARST radon testing protocols and mitigation standards, https://standards.aarst.org/
- HUD 3-part radon webinar series sponsored by the Office of Lead Hazard Control and Healthy Homes and Public and Indian Housing, https://www.hudexchange.info/programs/radon/
- Office of Lead Hazard Control and Healthy Homes, *About Radon*, https://www.hud.gov/program_offices/healthy_homes/healthyhomes/radon
- OEE, *Radon Fact Sheet*, https://www.hudexchange.info/resource/4955/oee-radon-fact-sheet/

For questions concerning this Notice, contact your local OEE field environmental office staff, https://www.hudexchange.info/programs/environmental-review/hud-environmental-staff-contacts/.

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