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Radon Potential in the Palos Verdes Area, California

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BACKGROUND:

Radon gas is a naturally occurring odorless and colorless radioactive gas. It forms from the radioactive decay of small amounts of uranium and thorium naturally present in rocks and soils. The average uranium content for the earth's continental crust is about 2.5-2.8 parts per million (ppm). Typical concentrations of uranium and thorium for many rocks and soils are a few ppm. Certain rock types, such as organic-rich shales, some granitic rocks, and silica-rich volcanic rocks may have uranium and thorium present at levels of five to several tens of ppm and occasionally higher. While all buildings have some potential for elevated indoor-radon levels, buildings located on rocks and associated soils containing higher concentrations of uranium often have an increased likelihood of elevated indoor radon levels. Breathing air with elevated radon gas abundance increases one's risk of developing lung cancer. Not everyone exposed to radon will develop lung cancer. However, in 2007 the U.S. Environmental Protection Agency estimated 21,000 people die in the United States annually from lung cancer attributed to radon exposure.

SUMMARY:

This report describes radon potentials for geologic formations in the Palos Verdes area of Los Angeles County, California. Additionally, this report documents the procedures and data used by the California Department of Conservation, California Geological Survey (CGS) to produce the radon potential zone map for the Palos Verdes area of Los Angeles County. CGS produced the map and report for the California Department of Public Health Indoor Radon Program through an interagency agreement.

Four radon potential categories, defined by the percentage of homes with indoor radon likely to equal or exceed 4.0 pCi/L: high (≥ 20 percent), moderate (5.0 to 19.9 percent), low (< 5 percent), and unknown (for geologic units with few or no data) are shown on the Palos Verdes radon potential map. Geologic unit occurrences with the same radon potentials were grouped to define the radon potential zones for the Palos Verdes area map. A final map development step involved statistical comparison of indoor-radon data populations for the resulting radon potential zones to confirm that each zone represents a distinct radon potential.

Radon potential maps indicate areas where the likelihood of a house exceeding 4 picocuries per liter (pCi/L) (the U.S. EPA recommended radon action level) is relatively higher or lower. They may also be used with population data to estimate the number of individuals exposed to excessive radon levels within the area of map coverage. Radon potential maps are informational, not regulatory, and show areas more likely and areas less likely to have homes with indoor-radon measurements exceeding the U.S. EPA recommended action level of 4 pCi/L. The map cannot be used to determine the indoor-air radon level of a particular building. Radon potential maps and related population estimates can help government agencies and private organizations identify priority areas for future radon testing and public education efforts. All radon potential areas, high, moderate or low, contain some homes with indoor-radon measurements above the U.S. EPA recommended action level. Testing a home for radon is the only way to determine its radon level, no matter where it is located.

AVAILABILITY:

Special Report 224 is available as a free download on the California Geological Survey website at http://www.consrv.ca.gov/cgs/ . Printed copies of the Special Report 224 can be ordered from the California Geological Survey offices in Sacramento and Menlo Park.

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