Radon test kits also available at:

- **Washoe County Cooperative Extension**
  4955 Energy Way, Reno
  888-723-6610

- **Incline Village Recreation Center**
  980 Incline Way, Incline Village
  775-832-1300

- **Carson City Cooperative Extension**
  2621 Northgate Lane, Suite 15
  775-887-2252

Call the Radon Hotline for other Cooperative Extension offices: **1-888-RADON10**
(888-723-6610)

website [www.RadonNV.com](http://www.RadonNV.com)
RADON: What you don’t know could hurt you

Presented by Jamie Roice-Gomes
Radon Education Coordinator
Nevada Radon Education Program
University of Nevada Cooperative Extension

Nevada Radon Education Program
Sponsored by the Nevada Division of Public and Behavioral Health and
U.S. Environmental Protection Agency

Slides courtesy of EPA, Center for Environmental Research & Technology Inc., and R. William Field, PhD, MS, University of Iowa, RadonAway, and Dependable Home Solutions
What is Radon?

- A naturally occurring radioactive gas
- A decay product of uranium, a common element in soil, rock and water
- Colorless, odorless and tasteless
Where is Radon?

- Radon is found all over the U.S. and the world.
- EPA estimates 1 in 15 homes in the U.S. has elevated radon levels.

EPA MAP OF RADON ZONES
Based on geology & surveys

- Zone 1 – Greatest occurrence
- Zone 2 – Moderate occurrence
- Zone 3 – Lowest occurrence
How Is Radon measured?

- picoCuries per liter of air (pCi/l)
- Average indoor level in U.S. is 1.3 pCi/l
- Average outdoor level in U.S is .4 pCi/l
- EPA’s Action Level is 4 pCi/l. (NOT A SAFE LEVEL!)

An average radon level of 4 pCi/l poses a similar risk of developing lung cancer to smoking half a pack of cigarettes a day!

- EPA suggests you consider fixing a home if levels are between 2 and 4 pCi/l.
- World Health Organization recommends fixing at 2.7 pCi/l
Actual radon test results since 1989 show 26% of Nevada homes tested have elevated radon levels.

All homes should be tested regardless of location, zone, zip code, etc.

Elevated radon levels are found everywhere.
Washoe County Radon Potential

- Highest result in the state is 155.6 pCi/l in 89511, Reno
- County average is 3.26 pCi/l

### Washoe County Data

<table>
<thead>
<tr>
<th>City</th>
<th>Zip Code</th>
<th>No. Valid Tests</th>
<th>No. Tests &gt; 4 pCi/l</th>
<th>% Potential</th>
<th>Average radon levels</th>
<th>Highest radon level</th>
</tr>
</thead>
<tbody>
<tr>
<td>Gerlach</td>
<td>89412</td>
<td>2</td>
<td>1</td>
<td>50%*</td>
<td>3.75</td>
<td>5.7</td>
</tr>
<tr>
<td>Washoe Valley</td>
<td>89704</td>
<td>115</td>
<td>54</td>
<td>47.0%</td>
<td>4.45</td>
<td>24</td>
</tr>
<tr>
<td>Verdi</td>
<td>89439</td>
<td>45</td>
<td>17</td>
<td>37.8%</td>
<td>6.44</td>
<td>80.1</td>
</tr>
<tr>
<td>Incline Village</td>
<td>89430</td>
<td>591</td>
<td>203</td>
<td>34.3%</td>
<td>3.95</td>
<td>63</td>
</tr>
<tr>
<td>Reno</td>
<td>89440</td>
<td>3500</td>
<td>766</td>
<td>21.9%</td>
<td>3.46</td>
<td>155.6</td>
</tr>
<tr>
<td>Crystal Bay</td>
<td>89402</td>
<td>21</td>
<td>5</td>
<td>23.8%</td>
<td>3.22</td>
<td>11.2</td>
</tr>
<tr>
<td>Sparks</td>
<td>89440</td>
<td>990</td>
<td>78</td>
<td>7.9%</td>
<td>2.10</td>
<td>73.8</td>
</tr>
<tr>
<td>Sun Valley</td>
<td>89433</td>
<td>165</td>
<td>10</td>
<td>6.1%</td>
<td>1.71</td>
<td>6.6</td>
</tr>
<tr>
<td>Wadsworth</td>
<td>89442</td>
<td>3</td>
<td>0</td>
<td>0%</td>
<td>2.03</td>
<td>3.3</td>
</tr>
<tr>
<td>Empire</td>
<td>89405</td>
<td>2</td>
<td>0</td>
<td>0%</td>
<td>1.30</td>
<td>1.3</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>5434</strong></td>
<td><strong>1134</strong></td>
<td></td>
<td><strong>20.9%</strong></td>
<td><strong>3.26</strong></td>
<td><strong>155.6</strong></td>
</tr>
</tbody>
</table>
Why is it a problem?

- Radon is a Class A carcinogen
  - Highest ranking for cancer potential
  - Known to cause cancer in humans
  - Tobacco smoke and products are in this category
- Radon causes about 21,000 lung cancer deaths per year in the U.S.
- Radon is the leading cause of lung cancer among nonsmokers.
  - Radon is the 2\textsuperscript{nd} leading cause of lung cancer for smokers.
Radon decay products are inhaled

- Radon decays into radioactive particles known as radon decay products.
  - The particles are easily inhaled and deposited in the lungs where they can damage sensitive lung tissue.
How Radon causes lung cancer

Inhalation of Radon decay products

Alpha particles irradiate the lungs and can damage sensitive lung tissue.
Alpha particles are strong enough to pit plastic

- Exposed for 3 months at the EPA Action Level of 4 pCi/l
- Alpha particles can damage lung cells similarly

Photo: J.F. Burkhart
Plastic chip from an alpha track test magnified 100 times
The Radon-Risk factor

- Risk increases by duration and concentration of exposure
  - One Radon dart at a time for a long time
  - Or handfuls of Radon darts over a short time
How Radon compares to other causes of death

**Radon Health Risk**

<table>
<thead>
<tr>
<th>Cause</th>
<th># of deaths per year</th>
</tr>
</thead>
<tbody>
<tr>
<td>Radon</td>
<td>21,000</td>
</tr>
<tr>
<td>Drunken Driving</td>
<td>10,839</td>
</tr>
<tr>
<td>Falls in the home</td>
<td>8,000</td>
</tr>
<tr>
<td>Drowning</td>
<td>3,900</td>
</tr>
<tr>
<td>Secondhand Smoke</td>
<td>3,000</td>
</tr>
<tr>
<td>Home Fires</td>
<td>2,800</td>
</tr>
</tbody>
</table>

Where Radon enters homes

RADON source nearby or below
Radon is naturally drawn into buildings

- Geology below the surface provides conduits or the source for radon gas.
- Houses suck!
  - Negative pressure of a building
  - Thermal stack effect
  - Mechanical exhaust devices

RADON source nearby or below
Testing is the only way to know if you and your family are at risk.
Short- and Long-term tests

Short-term test kits – SCREENING TESTS
- Exposed to air for 2 to 4 days

Long-term test alpha track
- Exposed 91 days to a full year

Continuous radon monitor
- Usually for Real estate purposes
- Results within 48 hours
Closed-house conditions for short-term testing

- Close outside doors and windows 12 hours before the test and during the test, except for normal entry and exit
- Turn off internal-external air exchange systems
- Radon mitigation systems should remain on
Testing location depends on where you spend the most time

- Choose an occupied room
- Keep away from drafts and moisture
VERY IMPORTANT:

- Start date and time
- End date and time
- Test location and Report address
- Keep record of your serial number
Screening Test Results

- If result is less than 4 pCi/l – No Problem
  - *If you tested in the summer, we recommend a follow-up test during the heating season, or a year-long test.

- If result is greater than 8 pCi/l - Radon Problem
  - Confirm it with another short-term test
  - If the average of the two tests is at or above 4 pCi/l, the home should be fixed.

- If result is between 4 and 8 pCi/l – A Possible Problem
  - Confirm it with a year-long test
  - If the result of the year-long test is at or above 4 pCi/l, the home should be fixed.
If your house has elevated Radon levels

- It can be fixed – mitigate using a **CERTIFIED MITIGATOR** who is a **NV licensed contractor**.

Radon mitigation systems

- Reduces radon levels
- Prevents radon from ever entering the living space

- Try to get two estimates
Sub-membrane Depressurization System

- Use high strength Polyethylene sheeting
  - A variety of quality, strengths and insulating thickness available
- Adhered to foundation with Polyurethane caulking
- Perforated pipe under sheeting collects gas
- Solid pipe exits crawl space and connects to exterior fan
Cost estimates for mitigation

- Basement / Slab foundations
  $800 to $3,000 (average $1,500)

- Crawl space systems
  $2,500 to $5,000 (average $3,000)

- New home construction system
  Cost is much less than fixing an existing home if the builder can install the system himself.
Radon Systems for Builders

Do-it-yourself Mitigation $25

Available at public libraries:
Radon Doesn’t Have To Be A Problem

University of Nevada Cooperative Extension
Susan Howe
Program Director
(775) 336-0248
robertss@unce.unr.edu

Jamie Roice-Gomes
Radon Education Coordinator
(775) 336-0252
roicej@unce.unr.edu

State Radon Hotline:
1-888-RADON-10
(1-888-723-6610)

Radon website: www.RadonNV.com

Nevada Division of Public and Behavioral Health
Adrian Howe
775-687-7550
ahowe@health.nv.gov

www.epa.gov/radon
IF YOU TAKE A TEST KIT PLEASE BE SURE TO USE IT!

- Our program purchased these kits as a service to Nevada citizens
- We may send you a reminder email or post card if you don’t use it soon.

Please fill out test kit form for free test kit