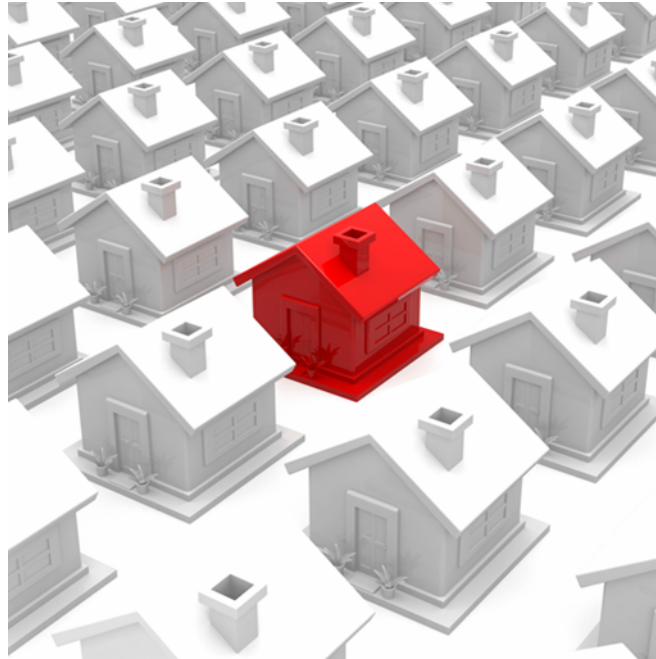


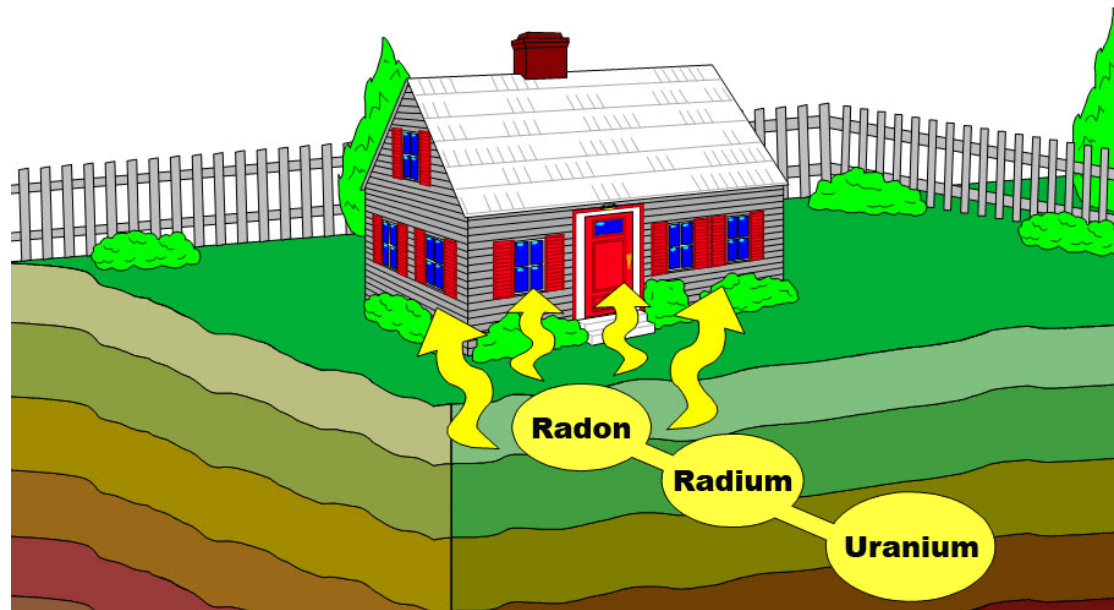
Radon Testing



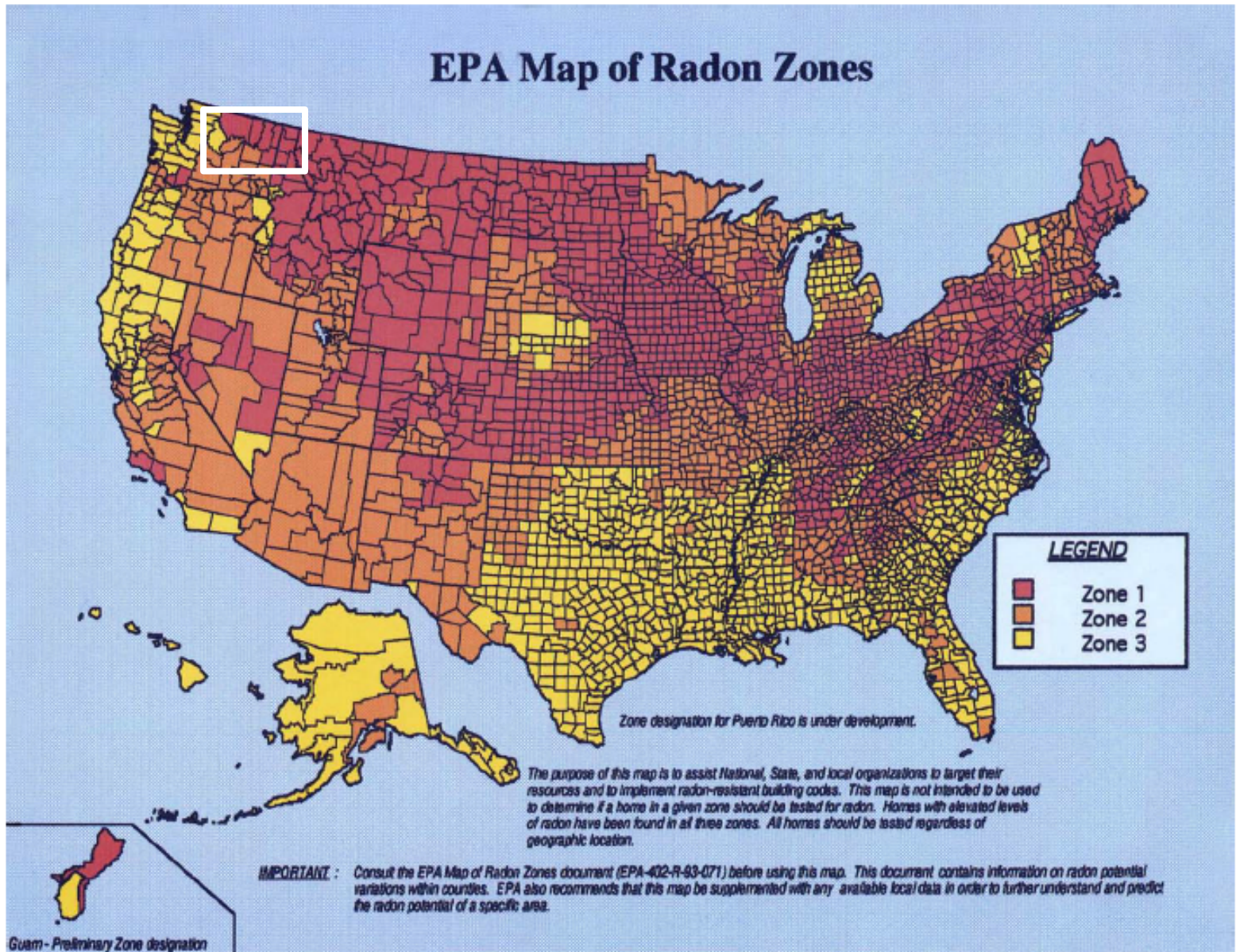
Twa-le Abrahamson-Swan
Spokane Tribal Air Quality Department
509-626-4403
twalea@spokanetribe.com

RADON: Spokane Reservation

- Reservation is rich in uranium deposits and has high radon potential (**Zone I**)
- Previous testing indicated high levels (30-40% homes higher than US Average)
- Some testing and mitigation efforts in the 80s






Radon “potential” Map

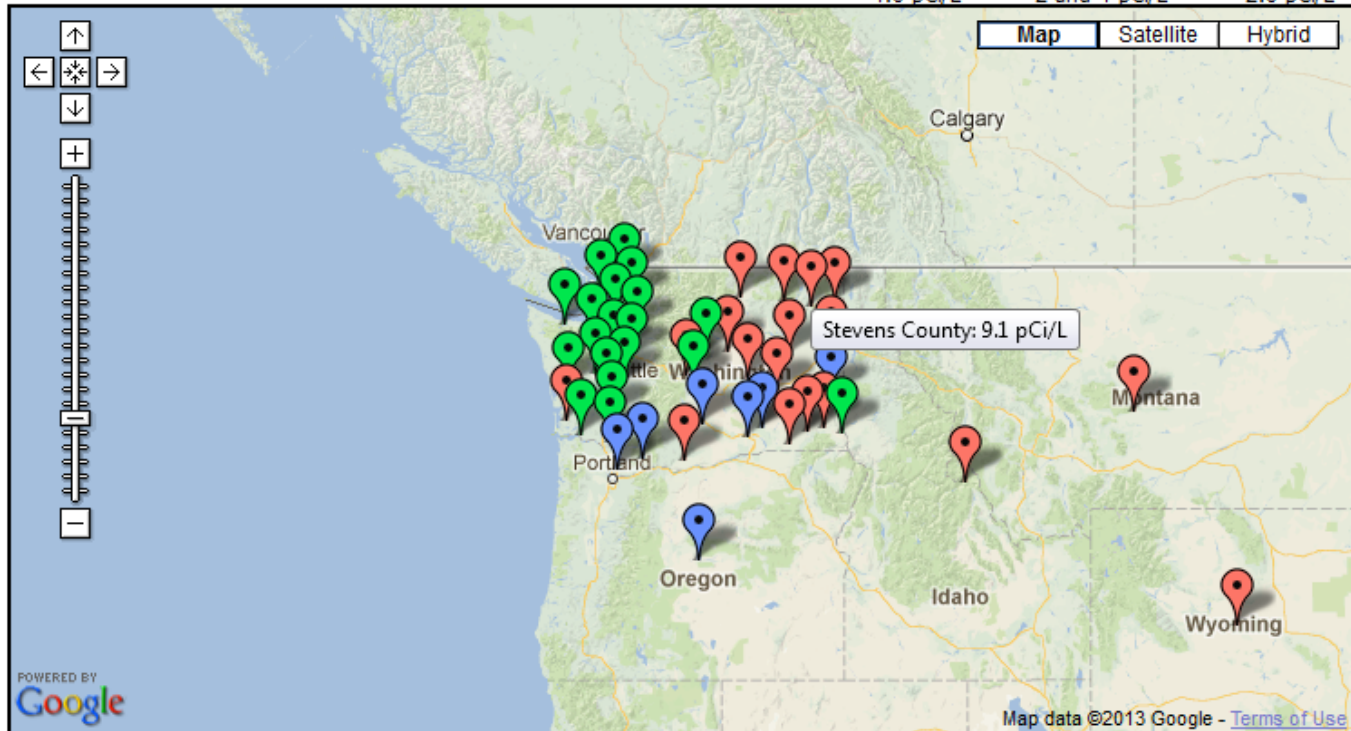




[HOME](#) > [Your Radon Levels](#) >

Radon Levels by State

 Above 4.0 pCi/L
  Between 2 and 4 pCi/L
  Less than 2.0 pCi/L



Mouse over the pointers for more information

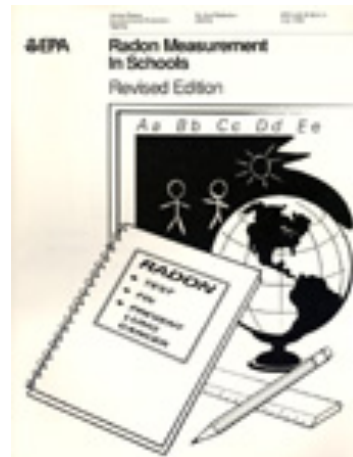
The data presented above was collected from Air Chek, Inc., the US EPA, and various state and county health departments.

800-AIR-CHEK (800-247-2435) · Hours: **8:30-5:30** Eastern Time, Monday - Friday

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Where to start?

1. Test your own homes, offices, schools.
2. Standard Operating Procedures Available from many EPA sources (Radon, Tools for Schools)
3. Additional training?



Radon Measurement Certification

- NOT required for Tribal Programs
- EPA *had* a National Radon Proficiency Program
 - Closed in 1998, “due to the Agency’s limited resources”
 - Recognized two non-federal radon proficiency programs:
 - The National Radon Safety Board (NSRB)
 - The National Environmental Health Association’s (NEHA) Radon Proficiency Program (NRPP)
- NEHA’s National Radon Proficiency Program
 - Residential Measurement Provider – qualified to place, retrieve, and interpret radon results
 - Entry level course (16 Hours)
 - Pass NRPP radon measurement exam
 - Application fee covers 2 years
 - Training: http://nrpp.info/entry_level.shtml
 - http://www.nrsb.org/course_meas_init.asp

Benefits of NEHA Certification

- Be recognized as a professional!
- ID Card
- Newsletters
- Information on educational programs and conferences
- Listed on the internet





Search for
 Certified . . . Measurement Professional
 Mitigation Professional
 Laboratory Services

About Radon Risk
 Case Studies
 Radon Testing Checklist
 How to Select a Professional
 Need a Speaker?



NRPP • National Radon Proficiency Program • NRPP

- About NRPP
- Certification
- Radon Training
- Radon Testing Devices
- Resources & Links
- Contact Us
- Home

NEHA-NRPP.org

Residential Measurement Providers Servicing Washington

- Recent News
- Find a Radon Professional
- Frequently Asked Questions
- Radon Publications
- Provider Service Standards
- Provider Qualifications
- Quality Assurance/Quality Control
- Test Chambers

* State and local agencies may have requirements in addition to NEHA's

S=Standard S/A=Standard & Analytical

Total found meeting search criteria: 37

CITY AND STATE OF RESIDENCE	NAME / STANDARD INFO	SERVICE TYPE	PHONE #
Bothell, WA	Patrick Thomas Moore Shaw Environmental, Inc.	S	(425) 402-3222
Mead WA	Sylvia J. Riddle	S	(509) 926-6217
		S	(509) 926-6217
	Advanced Radon Technologies, Inc.	S	(509) 326-5127
Spokane, WA	Mark S. Gerard Advanced Radon Tech, Inc.	S	(509) 326-5127
Spokane, WA	Chris Dixon Gold Seal Mechanical, Inc.	S	(509) 535-5944
Spokane, WA	Steven G Wilson Gold Seal Mechanical Inc.	S	(509) 535-5944
Wellpinit, WA	Twa-le Abrahamson Spokane Tribal Natural Resource	S	(509) 626-4403
	Scott Ackerman Ackerman Heating & Air Conditioning		
Hollister, CA	Bruce H. Howe Pacific West Property Inspections, Inc. dba House Master	S	(800) 995-4063

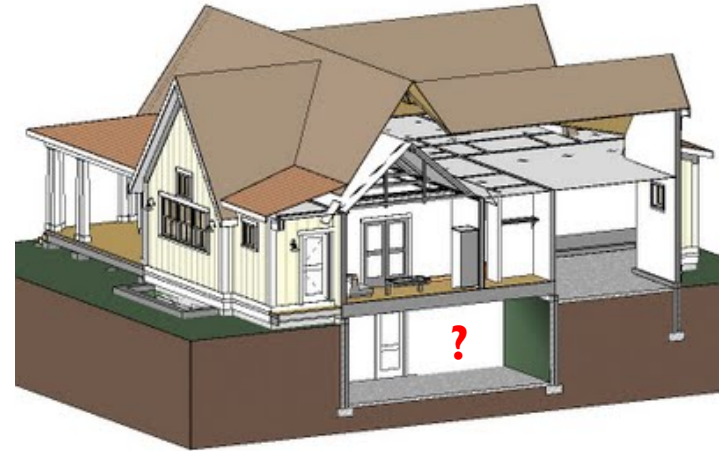
Wellpinit, WA

[Twa-le Abrahamson](#)
[Spokane Tribal Natural Resource](#)

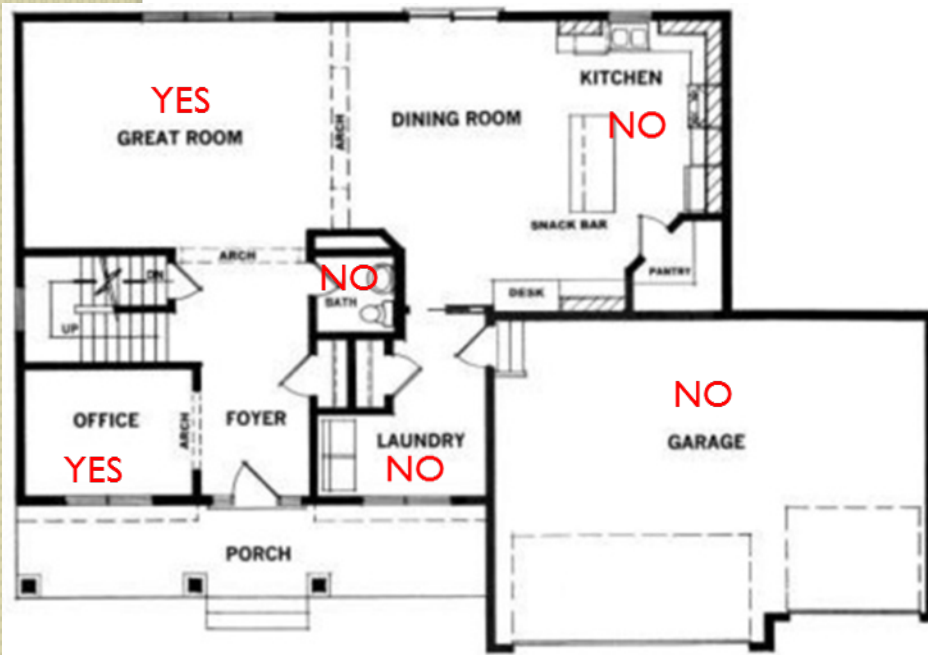


Testing Protocols

- Short Term Test: 2-7 days
- Test in the lowest lived in room in your home
- You want to know what your family is actually being exposed to.
- Results fluctuate seasonally –retesting is recommended or consider long term tests



Which room?



- In a room with low traffic, but frequently occupied (bedroom)
- Away from drafts
- Away from extreme heat and areas of high humidity.
- Avoid direct sunlight.

Location of Device in Room

- At least **20 inches** off the floor.
- Or hung, **6 to 8 feet** above the floor.
- More than **3 feet** from exterior doors, windows, or other openings to the outside.
- **12 inches** or more from an exterior wall.
- At least **4 inches** from other objects (including another test device)



Radon Measurement Devices

- Activated charcoal device
- Electret Ion Chamber (E-Perm)
- Continuous Radon Monitor



Activated Charcoal Devices

- For short-term tests
- Must be analyzed within 6 days
- Each device has its own test length



Advantages

- Compact, convenient and economical
- Can be used for 48-hour test
- Can be easily mailed to lab for analysis
- Passive, does not require power and silent
- Quick and accurate analysis

Disadvantages

- Limited to short-term sampling
- Provides no indication of changes (peaks and valleys) in radon during measurement.
- Hard to detect tampering

Activated Charcoal Devices

Electret Ion Chamber (E-Perm)

- Short-term and long-term measurements, measures radon in water with additional kit
- 2 days-1 year, dependent upon:
 - Configuration
 - Type of disk used
 - Anticipated radon concentration



Measuring Electret Voltages

- Electrets are pre-charged, can be reused.
- Electret voltages are measured and recorded before and after deployment.
- Math: (~ 2 volts drop per day per pCi/L)



Advantages

- Short-term and long-term measurements
- Electret can be re-used until voltage falls below 200 volts
- Can be recharged by manufacturer (\$15 each)

Disadvantages

- Sensitive to external gamma radiation. Correction needed.
- Sensitive to altitude changes. Correction needed.
- Can be damaged by touching surface, surface contamination or impact.
- Pre/post voltages must be measured at the same temperature.

Electret Ion Chambers

Continuous Radon Monitors

- Sun Nuclear (Solid State Silicon Detector)
 - Provides continuous measurements
 - Impacts from alpha particles are counted.
 - Data plotted and averaged
 - Relatively low efficiency
 - Used for diagnostics



Advantages

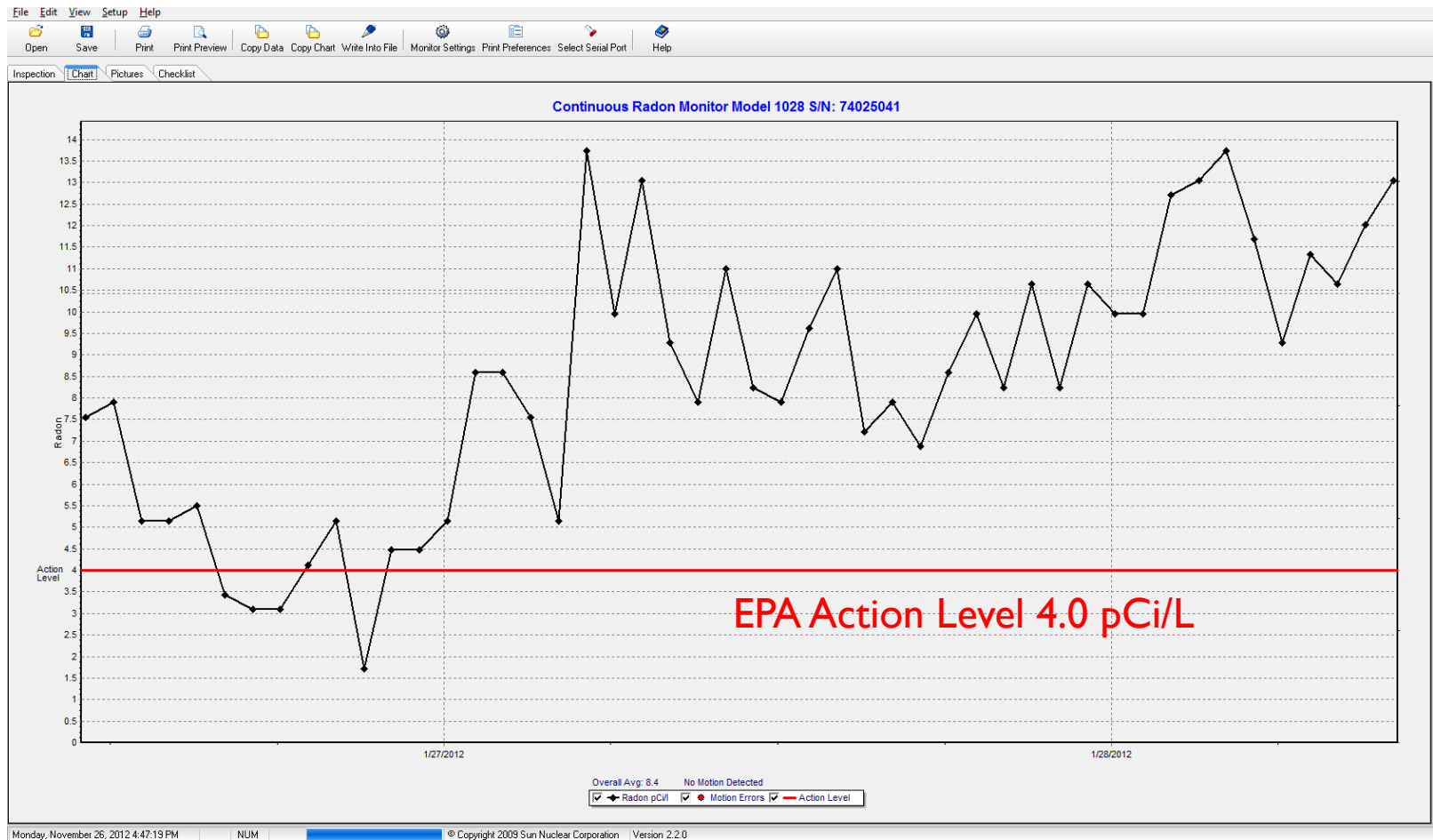
- Exposure variable: 48 hrs to many months
- Relatively good precision
- Can track hourly variations
- Options to download or print on site
- Can indicate tampering or ventilation.

Disadvantages

- Higher priced
- Requires trained operator
- Annual calibration
- Bi-annual performance tests.
- Can only test one room at a time.

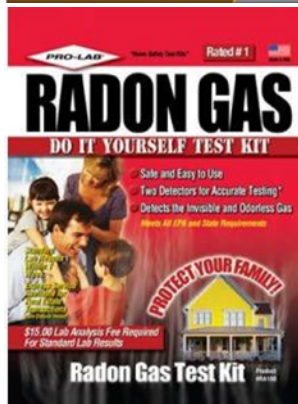
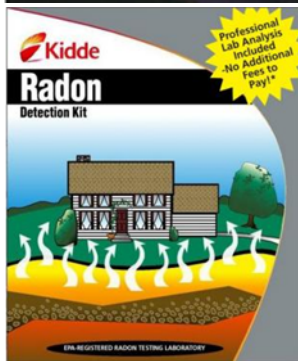
Continuous Radon Monitors

Results from a CRM



- My office in the Spokane Tribal Natural Resources Building
- Average 8.6 pCi/L, Highest Reading 13.7 pCi/L in the mornings about 4-7 AM
- Adjusted ventilation system and rates, used the building during mitigation training, now...just need some hands to install

Do It Yourself Test Kits



Walmart.com	“First Alert”	\$13.08 (Includes lab fee)
Lowes	“Kidde”	\$12.97 (Includes lab fee)
Home Depot	“Pro Lab”	\$9.98 for 2 (Does <u>not</u> include lab fee of \$30)
Ace Hardware	“Pro Lab”	\$11.99 for 2 (Does <u>not</u> include lab fee of \$30)

TIPS:

- Read and follow all included instructions
- Placement and shipping schedule are important
- Verify if lab fees are extra

Next steps...

Strategies to Address Structural, Institutional and Behavioral Issues

- 1) Test for Radon
 - Education and Outreach
- 2) Implement Radon Reduction Plans (Building Codes)
 - Education and outreach
- 3) Radon Mitigation
 - Education and outreach – construction staff, Housing staff

Radon Mitigation Training



Questions?

Twa-le Abrahamson-Swan
twalea@spokanetribe.com
(509) 626-4403



- www.epa.gov/radon
- www.sosradon.org