

Bend-La Pine Schools Step-By-Step Guide for Radon Testing

Per ORS 332.166-167, Oregon school districts will test for elevated radon levels at all sites under their jurisdiction before January 1, 2021. Sites will be retested once every ten (10) years and after major building or HVAC system renovations regardless of any mitigation. If major renovations are planned, sites will be retested before initiating the renovation. If elevated radon is present, radon-resistant techniques will be included in part of the renovation.

Test kits and testing services must meet the current requirements of the national certifying organizations National Radon Proficiency Program, NRPP (www.nrpp.info) or the National Radon Safety Board, NRSB (www.nrsb.org). Testing must be done following the directions on the test kit.

Prior to testing, a Certified Performance Test Chamber (<http://aarst-nrpp.com/wp/test-chambers/>) will be contacted to discuss the chamber's spiking schedule and arrange ongoing spiking services for the duration of the testing project. Spikes are measurements used to assess the accuracy of a lab and assess the accuracy of the detectors that are supplied. Spikes are test kits that have been exposed to a known concentration of radon in a chamber approved by the NRPP or NRSB. This is the Quality Control Plan for testing.

Initial Measurements

Initial measurements will be short-term measurements of 2-7 days in frequently occupied rooms in contact with the soil. Test kits will be placed during the colder months of October through March when there are no abnormal weather or barometric conditions predicted by the National Weather Service. Abnormal weather conditions are defined as severe storms that create winds over 58MPH, hail over three-quarter inches in diameter and potentially cause tornadoes. Severe weather may temporarily increase radon concentrations.

Test kits will be placed during the weekdays in normal operating conditions, when the sites are occupied, outside doors and windows are closed and heating/HVAC systems are in normal operation.

Test kits will be placed in the following locations:

1. All rooms frequently occupied by students and staff in contact with the ground or located above a basement or crawlspace will be tested. This includes:
 - a. Offices
 - b. Classrooms (1st floor)
 - c. Computer Rooms
 - d. Conference Rooms
 - e. Gyms

- f. Cafeterias
 - g. Auditoriums
 - h. Break Rooms
2. Test kits will be located:
- a. Where they are least likely to be disturbed or covered up.
 - b. At least three feet from doors, windows to outside or ventilation ducts.
 - c. At least one foot from exterior walls.
 - d. At least 20 inches and up to six feet from the floor.
 - e. At every 2,000 square feet for large spaces (gyms, cafeterias, etc).
- Kits can be placed on a teacher's desk, bookshelf, cabinet, etc., out of the way of students if the above requirements are met.
3. Test kits will NOT be placed:
- a. Near drafts resulting from heating, ventilation or air conditioning vents, fans, doors and windows.
 - b. In direct sunlight.
 - c. In areas of high humidity such as bathrooms, kitchens, laundry rooms, etc.
 - d. Where they may be disturbed at any time during the test.
4. Rooms that are excluded are:
- a. Bathrooms
 - b. Kitchens
 - c. Hallways
 - d. Stairways
 - e. Elevators
 - f. Storage Rooms

See site map for a detailed floor plan of rooms to be tested.

5. Test Kits
- a. Site Name:
 - b. Number of Rooms (Under 2,000 sq ft):
 - c. Number of Rooms (Over 2,000 sq ft – 1 kit per 2,000 sq ft):
 - d. Total Number of Test Kits Required:
6. Quality Control Measurements
- a. Number of duplicate measurements to be deployed during measurement (Rooms to be tested x .10):
 - b. Number of blank measurements to be deployed during measurement (Rooms to be tested x .05):
 - c. Number of spike measurements to be deployed during measurement (Rooms to be tested x .03):
 - i. Test kits designated for spiking (3%) will be sent to the chamber prior to testing. The chamber will spike the requested number of kits with a known amount of radon, document the radon level and send them to the designated site. The arrival of the spike kits will

coincide with the end of the measurement period of that site. Spikes will then be included in the same container as the other test kits (but not identified as Spikes) and shipped overnight to the Radon Measurement Laboratory.

7. Total Number of Test kits for all sites:
 - a. Number of detector kits:
 - b. Number of duplicate tests (#6a):
 - c. Number of blank tests (#6b):
 - d. Number of spike tests (#6c):
 - e. TOTAL TEST KITS:

8. All test kits (detectors, duplicates and blanks) along with the Spikes will be picked up on a designated day and mailed overnight to a Certified Performance Test Chamber.

9. Test results will be available within 2-4 weeks.

Interpreting Results and Follow Up Measurements

1. Initial testing will be reviewed and any site results that are less than 4.0 pCi/L will not need to be retested for ten years.

2. Any results that are at 4.0 pCi/L – 8.0 pCi/L will have long-term follow-up measurements conducted within one month in the same location of the room with comparable weather conditions. This test will be conducted over as much of the nine-month school year as possible. If the follow-up test result is greater than 4.0 pCi/L then a Radon Specialist may be consulted with regards to radon mitigation.

3. Results that are greater than 8.0 pCi/L will need a follow-up short-term measurement conducted and the two results averaged. If the average is ≥ 4.0 pCi/L then a long-term measurement over as much of a nine-month school year as possible should be performed in every room with this reading. If the long-term test results in a reading greater than 4.0 pCi/L then a Radon Specialist may be consulted with regards to radon mitigation.
 - a. Commonly use mitigation methods are Crack Sealing, Active Soil Depressurization and Mechanical Ventilation.

4. Any detector kits that had duplicate kits paired with them will be compared by calculating the Relative Percent Difference (RPD).

$$RPD = \frac{[\text{Initial Result} - \text{Duplicate Result}]}{\text{Average of Both Results}} \times 100\%$$

If Results Are:	Expected Range	In Control	Warning	Out of Control
2.0 – 3.9 pCi/L	0-025%	0-049%	50-067%	> 67%
≥ 4.0 pCi/L	0-014%	0-027%	280-036%	> 36%

If a result over 4.0 pCi/L differs by 28% or more, the data quality will be questioned.

In this case, we will contact the Radon Measurement Lab to investigate the situation further. It is possible that the room associated with the questionable duplicate may need to be retested. If the lab doesn't provide a satisfactory answer, a District representative will contact a Radon Measurement Professional to discuss.

5. Using Spike Testing Results:

- a. Spike testing results help to ensure that bias is not influencing a site's test results. Yet one spike result that's outside the 'Control Limit' does not mean that the school site's test results are completely off. Trends in the values in the Percent Difference table will be looked at.

Relative Percent Error (RPE)	Expected Range of Variability	In Control	Warning	Out of Control
	Between + 10% And -10%	Between + 20% And -20%	Between + 30% And -30%	Outside + 30% And -30%

A trend in RPE values that are more than $\pm 30\%$ will be investigated.

Storage, handling and kit placement will be reviewed and the Radon Measurement Lab will be contacted and the RPE results discussed so that the Lab can review its own procedures.

Reporting and Distribution of Results

- 1. All reporting and results will be made available to the Bend-La Pine School Board, the Oregon Health Authority and to staff, students, parents and community members via the District website:
<https://www.bend.k12.or.us/district/organization/healthy-safe-facilities>

Results can also be requested via email and a hard copy can be attained at the Administration Building.

Radon Testing: Bend-La Pine Schools
7/1/16

Passive Test Kits

<u>Elementary</u>	<u>Middle School</u>	<u>High School</u>
Amity Creek: 11	Cascade: 43	Bend High: 80
Bear Creek: 35	High Desert: 26	La Pine: 50
Buckingham: 32	La Pine: 35	Marshall: 15
Elk Meadow: 33	Pacific Crest: 60	Mt. View: 70
Ensworth: 21	Pilot Butte: 50	Summit: 75
High Lakes: 32	Realms: 10	
Juniper: 30	Sky View: 50	
Kenwood: 24		
La Pine: 33		
Lava Ridge: 33		
Pine Ridge: 33		
Ponderosa: 33		
RE Jewell: 32		
Rosland: 25		
Silver Rail: 32		
Three Rivers: 35		
WVMS: 17		
WE Miller: 33		
	<u>Other Sites</u>	
	Education Center: 25	
	Maintenance: 15	
	Transportation (Bend): 5	
	Transportation (La Pine): 2	
	Transition Co-Op: 3	
	Tamarack: 3	
	Warehouse: 12	

Elementary:	524
Middle School:	274
High School:	290
Other Sites:	65
Sub Total:	1,153
18% Control:	208
Total Kits:	1,361

Test Kit Costs @ \$15/ea:	\$ 20,415
Umpqua Research Testing @ \$189/kit:	\$257,229
10% Control – retesting: 136 @ \$189/kit:	\$ 25,704
Total Testing Cost:	\$303,348

Bend-La Pine Schools
NOTICE OF RADON TESTING

Date:

To: Site [name of site] Staff & Parents

From: [Superintendent or Director of Facilities]

Re: Testing for Radon at [Site]

Important steps are being taken to ensure that all sites within the Bend-La Pine Schools are safe.

This is to notify you that initial testing for radon at [Site] will be conducted starting on [Date]. Radon is found naturally in soil across the country and under all types of structures. Under a 2015 Oregon Law (ORS 332.166-167), Oregon schools must test for radon on or before January 1, 2021.

To test for radon at [site name], small devices will be placed in many rooms starting on [date]. These devices will be picked up on [date]. Test results will be available on the District website on or around [date].

The test devices are small black cylinders that will be placed in somewhat hidden locations whenever possible. Please do not tamper with or move test kits during the testing period and keep exterior windows and doors closed except for normal entry and exit.

While school occupants may be exposed to radon in schools, current data from the United States Environmental Protection Agency (USEPA) suggests that the number one source of radon exposure is in the home. For more information about radon please visit www.healthoregon.org/radon.

If you have further questions or concerns regarding radon testing at [site name], please feel free to contact [name of District contact] at [phone and email].

Thank you for your cooperation.

Bend La-Pine Schools
RADON TESTING IN PROGRESS

DO NOT TOUCH!

This is a screening test for Bend-La Pine Schools and the radon detector should not be disturbed. Windows will remain closed and the radon detector will be picked up on [date].

[Insert picture of radon detector here]

In compliance with ORS 332.166-167, the Bend-La Pine Schools are testing for radon, a colorless, odorless, naturally occurring gas found in soil across the country and under all types of structures.

For questions about this test, please contact [name] [phone or email].

Bend-La Pine Schools
Radon Testing Schedule

2017-2018

1. Amity Creek Magnet School
2. High Lakes Elementary
3. Highland @ Kenwood
4. WE Miller Elementary
5. Westside Village Magnet School
6. Cascade Middle School
7. Pacific Crest Middle School
8. Summit High School
9. Education Center
10. Transportation

2018-2019

1. Buckingham Elementary
2. Ensworth Elementary
3. Juniper Elementary
4. Lava Ridge Elementary
5. Ponderosa Elementary
6. Pilot Butte Middle School
7. REALMS
8. Sky View Middle School
9. Marshall High School
10. Mt. View High School
11. Tamarack

2019-2020

1. Bear Creek Elementary
2. Elk Meadow Elementary
3. Pine Ridge Elementary
4. RE Jewell Elementary
5. Silver Rail Elementary
6. High Desert Middle School
7. Three River School
8. Bend Senior High School
9. Distribution Center
10. Maintenance

2020-2021

1. La Pine Elementary
2. Rosland Elementary
3. La Pine Middle School
4. La Pine High School
5. La Pine Transportation