Eugene School District 4J
Facilities Management
715 West Fourth Avenue
Eugene, OR 97402-5024

RADON PLAN

The 2015 Legislature passed House Bill (HB) 2931 so that if elevated radon levels in Oregon schools existed they would be known. House Bill 2931 later became Oregon Revised Statute (ORS) 332.166-167. As directed by this statute, all school districts in Oregon must develop a plan to accurately measure school buildings for elevated radon levels. Under the statute, school districts were to submit a plan to Oregon Health Authority (OHA) by September 1, 2016. Per ORS 332.166-167, actual testing of schools must be done on or before January 1, 2021 and the testing results sent to OHA and posted at the district's website. OHA's Testing for Elevated Radon in Oregon Schools 2016.pdf, specifically Appendices A and D will be used to guide this effort.

Per ORS 332.166-167, the District must, at a minimum, conduct initial measurements in all frequently occupied rooms in contact with the soil or located above a basement or a crawlspace. United States Environmental Protection Agency (US-EPA) studies indicate that radon levels on upper floors are not likely to exceed the levels found in ground-contact rooms. Testing rooms on the ground-contact floor or above unoccupied basements or crawlspaces is sufficient to determine if radon is a problem within a school. Areas such as rest rooms, hallways, stairwells, elevator shafts, utility closets, kitchens storage closets do not need to be tested. Testing will occur in all spaces simultaneously per school site as outlined below.

Short term initial and follow-up testing will use passive test devices. Active devices (electrically powered, continuous radon monitors) may be used in follow-up testing of locations, where it is important to determine that radon levels vary according to the time of day. The District will schedule testing during the coldest months of the year as testing under "closed conditions" is important to obtain meaningful results from short-term tests. "Closed conditions" are defined as keeping all windows closed, keeping doors closed except for normal entry and exit, and not operating fans or other machines which bring in air from outside. Fans that are part of an existing radon-reduction system or small exhaust fans operating for only short periods of time may run during the test. Testing will occur between October and March in any given school year. Test Kits will be placed during weekdays with HVAC (heating, ventilation, air conditioning) systems operating as they do normally. The following is a detailed protocol instruction checklist:

1. A Test Kit Placement Log and a Test Kit Location Floor Plan will be prepared for each school in which radon measurements are made. Test kit locations will be recorded by their serial number on both a Log and Floor Plan. Test kits or testing services must meet the current requirements of the national certifying organizations, National Radon Proficiency Program (NRPP, *https://nepis.epa.gov/Exe/ZyPURL.cgi?Dockey=9101X2VN.TXT*) or the National Radon Safety Board (NRSB, www.nrsb.org). Testing will be completed following the directions on the test kit.

2. Per ORS 332.166-167, the District will conduct initial measurements in all frequently occupied rooms in contact with the soil or located above a basement or a crawlspace. Room examples include offices, classrooms, conference rooms, gyms, auditoriums, cafeterias and break rooms.

3. The quantity of test kits (detectors) used to measure radon will be site specific and based on the requirements referenced or mentioned within this document. Added to this number will be the test kits needed for Quality Assurance purposes. Quality Assurance procedures will be conducted as described in OHA's Testing for Elevated Radon in Oregon Schools.

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4. Testing will occur during the time that students and teachers are normally present (during weekdays).

5. Test kit placement:
   a. Where they are least likely to be disturbed or covered up and may include the teacher's desk or up on a bookshelf, out of the way of students.
   b. At least three feet from doors and windows to outside or ventilation ducts.
   c. At least one foot from exterior walls.
   d. At least 20" to 72" from floor.
   e. About every 2,000 square feet for large spaces (e.g., a 3500 square foot gymnasium would require two test kits).
   f. To prevent tampering, kits may be suspended from a wall or ceiling (using string and thumb-tack/tape).

6. Test kits will NOT be placed:
   a. Near drafts resulting from heating, ventilating vents, 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.
   e. During structural changes, the renovation of the building's envelope, or modification of the HVAC system.

7. Testing with short-term test kits will be used during:
   a. Closed Conditions: Short-term tests will be made under closed conditions in order to obtain more representative and reproducible results. Open windows and doors permit the movement of outdoor air into a room and the subsequent dilution of radon gas by outdoor air may produce a reduced measurement.

   b. Colder Months (October through March): The District will schedule testing during the coldest months of the year. During these months, windows and exterior doors are more likely to be closed. The District will document local weather forecasts prior to placing test kits. The District will not conduct short-term measurements (2-5 days) leading up to forecast severe storms or period of high winds, as defined by the National Weather Service.
   c. Normal HVAC Operation: Schools will only be tested for radon during periods when the HVAC system is operating as it does normally. Colder months normally result in reduced use of outside air.

8. The District will follow the "Interpreting initial results" section of the OHA's "Testing for Elevated Radon in Oregon Schools." See Reference above.

9. Follow-up Measurements. Follow-up testing in rooms with initial short-term measurement of 4.0 pCi/L or higher will start within one month after receiving the initial test results or as required conditions meet those outlined above. Follow-up testing will be made in the same location as initial testing. When conducting follow-up testing using short-term methods, it will be done in the same conditions as the initial measurement. Follow-up testing using passive short-term test kits will follow the same Quality Assurance procedures and requirements (i.e. percentages of duplicates/blanks/spikes), including quality assurance calculations.

10. Report of Results & Distribution. The District will make all test results available to the District's school board; the Oregon Health Authority (to post on its website), and to parents, guardians, students, school employees, school volunteers, administrators and community representatives at the school office, district office or on a website for the school or school district.

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US EPA, OHA Oregon Radon Awareness Program, and numerous non-governmental groups recommend that the school district take action to reduce the radon level in those rooms where the average of the initial and follow-up short-term kit results OR the result of the long-term kit used in follow-up is 4.0 pCi/L or more.

Initial testing will be conducted in accordance with ORS 332.166-167 before January 1, 2021. Because buildings age and ground beneath them settles, radon entry may increase due to cracks in the foundation. For that reason, ORS 332.166-167 requires that schools be tested once every 10 years regardless of initial testing results or whether mitigation was done.

Suggested times, for retesting, in addition to that required under ORS 332.166-167, are as follows:

1. Current national guidelines (ANSI/AARST, 2014) recommend that school buildings be re-tested every five years.

2. If radon mitigation measures have been implemented in a school, retest these systems as a periodic check to ensure that the radon mitigation measures are working. EPA does not provide a specific interval, but OHA recommends that schools with radon mitigation measures retest every 5 years.

3. Retest after major renovations to the structure of a school building or after major alterations to a school's HVAC system. These renovations and alterations may increase radon levels within a school building.

4. If major renovations to the structure of a school building or major alterations to a school's HVAC system are planned, retest the school before initiating the renovation. If elevated radon is present, radon-resistant techniques may be included as part of the renovation.

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GLOSSARY

Radon - A gaseous radioactive decay product of radium.

Blanks - Measurements made by analyzing unexposed (closed) detectors that accompanied exposed detectors to the field. The Districts use of blanks is to assess any change in analysis result caused by exposure other than in the environment to be measured. Background levels may be due to leakage of radon into the detector, detector response to gamma radiation, or other causes.

Closed-Building Conditions - Means keeping all windows closed, keeping doors closed except for normal entry and exit, and not operating fans or other machines which bring in air from outside. Fans that are part of an existing radon-reduction system or small exhaust fans operating for only short periods of time may run during the test.

Duplicates - Duplicate measurements provide a check on the precision of the measurement result and allow the District to estimate the relative precision. Large precision errors may be caused by detector manufacture or improper data transcription or handling by suppliers, laboratories, or technicians performing placements. The precision of duplicate measurements are monitored and recorded as quality records.

Spikes – Measurements used to assess the accuracy of a lab analysis and/or how accurately detectors supplied by a laboratory (i.e. test kit manufacturer) measure radon. “Spikes” are test kits that have been exposed to a known concentration of radon in a chamber approved by the National Radon Proficiency Program (NRPP) or National Radon Safety Board (NRSB). The process for completing this aspect of a radon measurement effort’s Quality Assurance/Quality Control plan is laid out in the Radon Test Placement Strategy and Protocol Checklist below.

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Appendix A: Test Kit Placement Guide

Once the number of test kits is determined, they will be placed in the frequently-occupied rooms as documented in the Testing for Elevated Radon in Oregon Schools.

a. Be sure to check these items before placing the radon test kits:

☐ Closed building conditions have been maintained in the building for 12 hours.

☐ HVAC system is operating as it normally would when students and faculty are present.

☐ Testing is being done during a time that students and faculty are present.

b. As detectors are placed in the rooms, thorough and accurate data needs to be recorded on the device log and floor plan. Protocol for all test kits include the following:

☐ in a location where it will be undisturbed

☐ out of direct sunlight

☐ three feet from all doors and windows

☐ four inches from all other objects

☐ at least 1 foot from all exterior walls

☐ at least 20 inches to 6 feet from the floor

☐ out of direct air flow from vents

☐ four feet from heat source

To protocol above, School Measurement Teams in other states simply place the test kit on the teacher's desk or up (out of the way of students) on a bookshelf.

c. Specific protocol for duplicate measurements. If the test kit you are placing is duplicate measurement also be sure to:

☐ Placed duplicate (side-by-side) test kit 4-5 inches away from test kit for that room.

d. Specific protocol for blank measurements. If the test kit you are placing is a blank measurement, also be sure to:

☐ Unwrap blanks, open, but then immediately close and reseal them.

☐ Place the test kit next to the detector kit(s) for the room 4-5 inches away.

e. Specific protocol for spiked test kits:

☐ Arrange for the spiked test kits to arrive back from the Certified Performance Test Chamber to the School Measurement Team as close to the day that kits are retrieved from the school as possible. [See *Quality Assurance Procedures for a School Radon Measurement Progra*m in OHA's "Testing for Elevated Radon in Oregon Schools."]

f. Testing Period:

Test kits will be left out a minimum of 48 hours, but will not exceed seven days. The district will follow the test kit manufacturer's instructions for placement timeframes.

Once the testing period has ended, all test kits placed (detectors, duplicates, & blanks) will be retrieved. This will be done on the same date, completing the data sheet when retrieving detectors.

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☐ Record ending date and time when kits were picked up per the "Test Kit Placement Log" [Appendix D of OHA's Testing for Elevated Radon in Oregon Schools.]

☐ Record ending information on the test kit package (if required).

g. Prepare and mail all kits:

☐ Seal and prepare test kits to be mailed to the lab by the manufacturer's instructions.

☐ Include those spiked kits (not identified as such) in the same box (es) as other kit types.

☐ Mail all test kits (detectors, duplicates, blanks, spikes) to the Radon Measurement Laboratory using a mail service that guarantees delivery to the laboratory within two days at maximum, but **preferably overnight** shipping.

1/11/2019

Signature/title FACILITIES MANAGER Date

Please mail, email or fax the signed document.

MAIL TO: Oregon Radon Awareness Program
800 NE Oregon St, Suite 640
Portland, OR 97232-2162

FAX TO: 971-673-0979
EMAIL TO: radon.oregon@state.or.us