

INDUSTRIAL HYGIENE REPORT

RADON TESTING REPORT

Bush Elementary School

Report to: Vonnie B. Good, EHS Salem–Keizer Public Schools

By: Kathy Ellis, Senior Industrial Hygiene Consultant

Reviewed By: DeEtta Burrows, MSPH, CIH – Wise Steps, Inc.

On-site: March 8 – 11, 2022

Report: April 14, 2022

PURPOSE

Radon retesting was done at Bush Elementary School to determine if there have been any changes in the background radon levels in the classrooms, offices and other rooms that are in contact with the ground since the 2013 testing.

This testing is a requirement in OAR 332.331 Healthy and Safe Schools Plan rules.

CONCLUSION and RECOMMENDATIONS

Most tested rooms had low levels of radon with the exception of three locations:

- Classroom 1 had a radon level of 3.2 picoCuries/Liter (pCi/L),
- Principal's office with 4.9 pCi/L and
- The Custodian's office with 3.7 pCi/L.

It is recommended to increase the amount of outdoor air supplied to these rooms via the ventilation system in order to reduce the airborne levels of radon. Retesting is then done to determine if the radon levels are within acceptable limits.

The retesting in these three rooms was done in twice, once in March and April. These tests found the radon levels had decreased to low levels.

TESTING

Radon testing was conducted using protocols recommended by the Oregon Health Authority per OAR 332.345. Radon Air-Chek short-term test devices were used in the rooms by suspending the device in each room. The testing occurred from March 8-11, 2022, during normal and routine school ventilation system operation. Weather conditions during the weeks prior to testing had been wet with moderate temperatures.

This testing was conducted under COVID-19 recommended precautions of having increased outside air supplied to the building.

Quality assurance testing was also conducted by blank (QCB) test devices, and duplicate samples per the recommendations found in OAR 332.345.

EPA RADON GUIDELINES

The EPA has set an Action Level of 4.0 pCi/L (picoCuries per liter) for schools. If classrooms, offices or buildings have radon levels at or above 4.0 pCi/L, EPA recommends that schools take action to reduce the level. These actions include:

Step 1. If your result is 4.0 pCi/L or higher take a follow-up test (Step 2) to be sure.

Step 2. Follow up with either a long-term test or a second short-term test.

The World Health Organization has set their action level at 2.7 pCi/L. Salem-Keizer Public Schools has determined that 2.7 pCi/L is a target level where retesting should be done.

CONTROL OF RADON LEVELS IN SCHOOLS

The major control mechanism for lowering radon levels within school buildings is the use of dilution ventilation. If the amount of outside air delivered into a building increases, the radon levels should decrease. The retesting in the three rooms with radon levels above the Action levels confirmed additional ventilation did lower the radon levels to acceptable levels.

March 15, 2022

**** LABORATORY ANALYSIS REPORT ****

Radon test result report for:

**BUSH
MAIN**

Kit #	Room Id	Started	Ended	pCi/L	Analyzed
11118605	CAFETERIA	2022-03-08 @ 11:00 am	2022-03-11 @ 9:00 am	0.9 ± 0.3	2022-03-14
11118604	CAFETERIA	2022-03-08 @ 11:00 am	2022-03-11 @ 9:00 am	1.0 ± 0.3	2022-03-14
11119188	COUNSELOR	2022-03-08 @ 11:00 am	2022-03-11 @ 9:00 am	1.0 ± 0.3	2022-03-14
11118611	CUSTODIAN OFFICE	2022-03-08 @ 11:00 am	2022-03-11 @ 9:00 am	3.7 ± 0.4	2022-03-14
11118607	GYM	2022-03-08 @ 11:00 am	2022-03-11 @ 9:00 am	0.8 ± 0.3	2022-03-14
11118606	GYM	2022-03-08 @ 11:00 am	2022-03-11 @ 9:00 am	1.0 ± 0.3	2022-03-14
11119186	MAIN OFFICE	2022-03-08 @ 11:00 am	2022-03-11 @ 9:00 am	0.9 ± 0.3	2022-03-14
11118602	MEDIA	2022-03-08 @ 11:00 am	2022-03-11 @ 9:00 am	< 0.3	2022-03-14
11118601	MEDIA	2022-03-08 @ 11:00 am	2022-03-11 @ 9:00 am	< 0.3	2022-03-14
11118613	MUSIC	2022-03-08 @ 11:00 am	2022-03-11 @ 9:00 am	0.6 ± 0.3	2022-03-14
11118612	MUSIC	2022-03-08 @ 11:00 am	2022-03-11 @ 9:00 am	0.8 ± 0.3	2022-03-14
11118608	PE OFFICE	2022-03-08 @ 11:00 am	2022-03-11 @ 9:00 am	0.7 ± 0.3	2022-03-14
11119189	PRINCIPAL	2022-03-08 @ 11:00 am	2022-03-11 @ 9:00 am	4.9 ± 0.4	2022-03-14
11118615	QCB1	2022-03-08 @ 11:00 am	2022-03-11 @ 9:00 am	< 0.3	2022-03-14
11118616	QCB2	2022-03-08 @ 11:00 am	2022-03-11 @ 9:00 am	< 0.3	2022-03-14
11119195	RM 1	2022-03-08 @ 11:00 am	2022-03-11 @ 9:00 am	3.2 ± 0.3	2022-03-14
11118609	RM 12	2022-03-08 @ 11:00 am	2022-03-11 @ 9:00 am	0.6 ± 0.3	2022-03-14
11118610	RM 12	2022-03-08 @ 11:00 am	2022-03-11 @ 9:00 am	0.8 ± 0.3	2022-03-14
11119194	RM 2	2022-03-08 @ 11:00 am	2022-03-11 @ 9:00 am	0.8 ± 0.3	2022-03-14
11119193	RM 3	2022-03-08 @ 11:00 am	2022-03-11 @ 9:00 am	0.7 ± 0.3	2022-03-14
11119192	RM 3	2022-03-08 @ 11:00 am	2022-03-11 @ 9:00 am	0.6 ± 0.3	2022-03-14
11119191	RM 4	2022-03-08 @ 11:00 am	2022-03-11 @ 9:00 am	0.9 ± 0.3	2022-03-14
11119190	RM 5	2022-03-08 @ 11:00 am	2022-03-11 @ 9:00 am	0.7 ± 0.3	2022-03-14
11119196	RM 6	2022-03-08 @ 11:00 am	2022-03-11 @ 9:00 am	0.9 ± 0.3	2022-03-14
11119200	RM 6	2022-03-08 @ 11:00 am	2022-03-11 @ 9:00 am	0.9 ± 0.3	2022-03-14
11119197	RM 7	2022-03-08 @ 11:00 am	2022-03-11 @ 9:00 am	0.7 ± 0.3	2022-03-14
11119199	RM 9	2022-03-08 @ 11:00 am	2022-03-11 @ 9:00 am	0.7 ± 0.3	2022-03-14
11119187	RM1 LEARNING GROUP	2022-03-08 @ 11:00 am	2022-03-11 @ 9:00 am	1.0 ± 0.3	2022-03-14
11118603	SMALL GOUP	2022-03-08 @ 11:00 am	2022-03-11 @ 9:00 am	0.6 ± 0.3	2022-03-14
11119198	SPEECH	2022-03-08 @ 11:00 am	2022-03-11 @ 9:00 am	0.8 ± 0.3	2022-03-14
11118614	STAFF ROOM	2022-03-08 @ 11:00 am	2022-03-11 @ 9:00 am	1.7 ± 0.3	2022-03-14

Air Chek 1936 Butler Bridge Rd, Mills River, NC 28759-3892 Phone: (828) 684-0893 Fax: (828) 684-8498

RETEST DATA

March 22, 2022

** LABORATORY ANALYSIS REPORT **

Radon test result report for:

**BUSH
MAIN**

Kit #	Room Id	Started	Ended	pCi/L	Analyzed
11118849	CUSTODIAL OFFICE	2022-03-15 @ 1:00 pm	2022-03-18 @ 1:00 pm	2.1 ± 0.3	2022-03-21
11118847	PRINCIPAL	2022-03-15 @ 1:00 pm	2022-03-18 @ 1:00 pm	0.9 ± 0.3	2022-03-21
11118850	QCB1	2022-03-15 @ 1:00 pm	2022-03-18 @ 1:00 pm	< 0.3	2022-03-21
11118848	RM 1	2022-03-15 @ 1:00 pm	2022-03-18 @ 1:00 pm	1.5 ± 0.3	2022-03-21

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April 11, 2022

** LABORATORY ANALYSIS REPORT **

Radon test result report for:

**BUSH
MAIN**

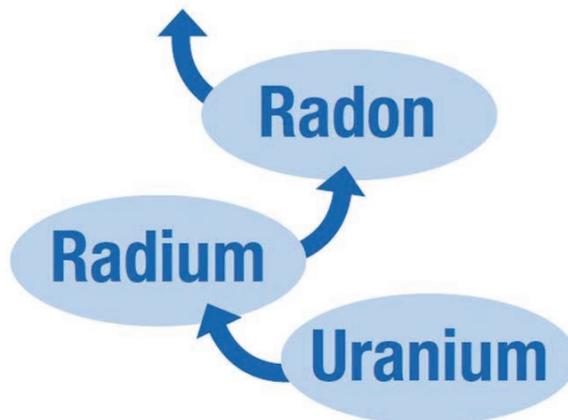
Kit #	Room Id	Started	Ended	pCi/L	Analyzed
9604575	CUSTODIAL OFFICE	2022-04-04 @ 2:00 pm	2022-04-07 @ 11:00 am	1.5 ± 0.3	2022-04-11
9604573	PRINCIPAL	2022-04-04 @ 2:00 pm	2022-04-07 @ 11:00 am	1.3 ± 0.4	2022-04-11
9604574	RM 1	2022-04-04 @ 2:00 pm	2022-04-07 @ 11:00 am	1.1 ± 0.3	2022-04-11

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Note: QCB1-3 are blank samples and part of the quality control process for radon testing.

Radon in schools

Fact Sheet on Radon Exposure for Students and Staff



What is radon?

Radon is a radioactive gas you can't see, smell or taste. It is a decay product of uranium and is found all over the world. Uranium and its decay products are naturally found in the soil and rocks beneath buildings. Our school image (right) shows how uranium naturally decays into radium that further breaks down into radon gas. Radon moves up through the soil and enters buildings in contact.

Why is radon a problem in Oregon schools?

Radon is the 2nd leading cause of lung cancer, after smoking. The Environmental Protection Agency (EPA) estimates around 21,000 radon-related lung cancer deaths occur each year. Breathing high levels of radon in combination with smoking is even more dangerous and increases your risk by ten times.

Home is likely the most significant source for breathing radon. According to the EPA, 1 out of 15 homes has high radon levels. School is likely the second largest source of radon exposure for students and staff. The only way to know your radon levels is to test. The EPA recommends that **all** homes and schools be tested for radon.

EPA
ACTION
LEVEL

4.0 **Picocuries**
Liter of air

Testing at Home

Radon testing at home can be simple and inexpensive. You can find do-it-yourself test kits at most local hardware stores and online from the [American Lung Association](http://www.AmericanLungAssociation.org). Oregon Health Authority (OHA) Radon Program also offers FREE test kits to those living in areas where little data is available. To find out if you are eligible, contact radon.program@state.or.us.

Testing in Oregon Schools

By law (ORS 332.341-345), all Oregon schools are required to test for radon before January 1, 2021.

School radon testing involves the placement of small testing devices in all frequently occupied rooms on the lowest level of the building. Initial testing is short-term and lasts between 2 and 7 days. Test devices are not dangerous in any way.

Rooms that test at or above 4.0 picocuries per liter of air (pCi/L) (EPA recommended action level) are subject to longer confirmation testing and radon reduction systems.

*Test results for your school can be found at:

<http://salkeiz.k12.or.us/parents/safe-schools/radon-testing/>

For more information about radon, visit www.healthoregon.org/radon.

If you have other questions or concerns about radon testing at your school, contact [Vonnie Good, Environmental Health Specialist](mailto:Vonnie_Good@salkeiz.k12.or.us) at 503-399-3071 or Good_Vonnie@salkeiz.k12.or.us.



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