

# INDUSTRIAL HYGIENE REPORT

## Candalaria Elementary School

Report to: Vonnie B. Good, EHS Salem Keizer School District

By: Kathy Ellis, Senior Industrial Hygiene Consultant

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

On-site: January 5–8, 2015

Report: February 8, 2015

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### PURPOSE

Radon monitoring was done to measure the background levels in all classrooms, offices and staff work rooms that are in contact with the ground or below ground level as a follow up after radon remediation engineering controls have been in place.

### TEST METHOD

Radon Air-Chek short-term test devices were used in each location by placing the device 5-6 feet above the floor where it is not in direct contact with airflow from the ventilation system, windows or exterior doors. Staff were requested to keep windows closed during the testing.

These short-term devices work by trapping room air inside the grains of charcoal with the devices, meaning that live radon gas is being captured. The analysis is performed by measuring the radiation emitted from the charcoal, which is proportional to the amount of radon that was present in the room air.

The testing occurred from Monday, January 5 to Thursday January 8, 2015 during normal and routine operation of the school.

### RESULTS

All classrooms, offices, and staff work areas had very low to non-detectable levels of radon. The only test location above the EPA's action level of 4 picoCuries per liter (pCi/l) was the unused "Dungeon" or storage room. This room was found to have an average radon level @ 14.6 pCi/L.

### BACKGROUND ON RADON

Radon is a gas that occurs in nature, seeping up from the earth. It is odorless, colorless and tasteless. Radon comes from the natural breakdown, or radioactive decay, from uranium 238, and produces radon. The half-life of an individual element is relatively short. Within two weeks, about 90% of a given amount of radon gas will be gone. However, the actual health concern is for the radon decay products, called radon

progeny, which carry a small static charge that allows their attachment to water vapor, dust and smoke particles in the air.

The Radon progeny can become lodged in the lung tissue when they are inhaled, and it is these particles' further radiation decay that is associated with potential lung cancer effects.

Radon can seep into buildings or schools through cracks in slab floors or porous cinderblock. It can enter around loose-fitting drainage pipes or through sump pumps.

The US EPA has set an action level of 4.0 pCi/L. At or above this level of radon, the EPA recommends that corrective measures should be taken to reduce the exposure to radon gas.

## **CONTROL OF RADON LEVELS IN SCHOOLS**

There are two radon mitigation systems at Candalaria. One for the west end of the building is a sub slab depressurization system in the closet in the boys' bathroom near the gym. The other consists of two fans on top of the boiler room, which draw air from the "dungeon," thus creating negative pressure for the east part of the school.

**Sample Data Attached**

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January 12, 2015

**\*\* LABORATORY ANALYSIS REPORT \*\***

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Radon test result report for:  
**SCHOOL**  
**CANDALARIA**

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<b>Kit #</b>	<b>Room Id</b>	<b>Started</b>	<b>Ended</b>	<b>pCi/L</b>	<b>Analyzed</b>
7015730	1	2015-01-05 @ 10:00 am	2015-01-08 @ 10:00 am	< 0.3	2015-01-09
7015731	2	2015-01-05 @ 10:00 am	2015-01-08 @ 10:00 am	< 0.3	2015-01-09
7015732	3	2015-01-05 @ 10:00 am	2015-01-08 @ 10:00 am	< 0.3	2015-01-09
7015733	4	2015-01-05 @ 10:00 am	2015-01-08 @ 10:00 am	< 0.3	2015-01-09
7015734	5	2015-01-05 @ 10:00 am	2015-01-08 @ 10:00 am	0.8	2015-01-09
7015736	6	2015-01-05 @ 10:00 am	2015-01-08 @ 10:00 am	1.9	2015-01-09
7015735	6 OFFICE	2015-01-05 @ 10:00 am	2015-01-08 @ 10:00 am	2.4	2015-01-09
7015727	CUSTODIAN	2015-01-05 @ 10:00 am	2015-01-08 @ 10:00 am	2.6	2015-01-09
7015729	DUNGEON	2015-01-05 @ 10:00 am	2015-01-08 @ 10:00 am	14.6	2015-01-09
7015738	PE OFFICE	2015-01-05 @ 10:00 am	2015-01-08 @ 10:00 am	< 0.3	2015-01-09
7015726	PRINCIPAL	2015-01-05 @ 10:00 am	2015-01-08 @ 10:00 am	1.5	2015-01-09
7015725	SPEECH	2015-01-05 @ 10:00 am	2015-01-08 @ 10:00 am	3.1	2015-01-09
7015737	STAFF ROOM	2015-01-05 @ 10:00 am	2015-01-08 @ 10:00 am	1.9	2015-01-09

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