



Testing, Mitigation, System Design
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CASCARI927C1
Fed ID 26-1809992

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Radon Survey Analysis
Job# 20-C077W

for

St. Helens School District
Columbia City Elementary
c/o Jared Plahn

property located at

2000 2nd Street

Columbia City, OR 97018

March 16, 2021

Introduction:

The following report documents a study of radon levels for the property located at 2000 2nd Street. The goal of this study is to determine indoor radon levels for all areas mitigated under contract #20-C077W and 10% of those above. Testing was performed per AARST/ANSI protocols (MAMF2017/MALB 2014) and EPA protocols.

Analysis assumes that the buildings tested were maintained under “closed-building” conditions (windows closed and exterior doors shut immediately after entering and exiting), as well as normal indoor temperatures, for the duration of the testing period. The H-VAC system for the building was set to normal occupied settings for the entirety of the testing period.

Conclusions and Recommendations:

Test was a “Short-Term” test, with minimum duration of 97 hours. See the chart below of areas in the building that were tested, and the corresponding levels found. All current test results are provided in Table 1. Note that all ten (10) locations tested had results below the USEPA Action Level of 4.0 pCi/L.

No mitigation action is recommended at this time.

This report represents the average radon concentration for the period that testing was and at the specific location(s) within the building. The concentration of radon gas in indoor air can vary widely; it fluctuates daily, seasonally, and with weather conditions. Indoor radon levels may be affected by barometric pressure, strong winds, rain-soaked ground, snow cover, heating and A/C systems, building construction, open windows, and the like. For further confirmation of average, long-term radon levels, it is suggested that long-term, Alpha-Track type radon testing be performed.

NOTE: It is recommended that any building indicating low radon values be retested at least every 5 years. In areas where mitigation has been performed, it is recommended to test using long-term testing at least every 2 years.

Radon Level Measurements:

The building tested was assumed occupied during testing. The measurement technique used (22) AirChek activated charcoal kits.

Test Start Date: 03/01/2021

Test End Date: 03/05/2021

Measurements of radon levels were made in the following areas:

Table 1: Results

Room	Floor	Kit ID #	Test Start Time	Test End Time	Result (pCi/L)
South Basement	Basement	9570511 & 9570509	1:00 pm	2:00 pm	1.5
North Basement	Basement	9570502 & 9570508	1:00 pm	2:00 pm	1.1
Room 12	Basement	9570515 & 9570516	1:00 pm	3:00 pm	0.8
Room 13	Basement	9570523 & 9570522	1:00 pm	3:00 pm	1.5
Room 14	Basement	9570520 & 9570519	1:00 pm	3:00 pm	0.9
Room 29	1st	9570521 & 9570517	1:00 pm	3:00 pm	2.6
Teachers lounge	1st	9570506 & 9570501	12:00 pm	2:00 pm	0.7
Main Office	1st	9570507 & 9570514	1:00 pm	2:00 pm	0.6
Gym South Wall	1st	9570510 & 9570512	1:00 pm	2:00 pm	1.5
Gym East Wall	1st	9570518 & 9570513	1:00 pm	3:00 pm	1.4

Duplicate measurements were conducted as a means to assess the precision of the test measurements. The criteria of acceptance is that the average relative percent difference (ARPD) of the results of the two measurement results for results whose averages are greater than 4.0pCi/L, should be within 25%. The results of the collated duplicates are provided in Table 2. The applicable ARPD for this survey was not applicable and is thus in compliance.

Table 2: *Duplicate Table:

Room	Kit ID#	Test Start Time	Test End Time	Result (pCi/L)	Average (pCi/L)	Avg > 3.9 pCi/L?	RPD%
South Basement	9570511	1:00 pm	2:00 pm	1.5	1.5	No	0%
South Basement	9570509	1:00 pm	2:00 pm	1.5		No	
North Basement	9570502	1:00 pm	2:00 pm	1.1	1.1	No	0%
North Basement	9570508	1:00 pm	2:00 pm	1.1		No	
Basement Room 12	9570515	1:00 pm	3:00 pm	0.7	0.8	No	25%
Basement Room 12	9570516	1:00 pm	3:00 pm	0.9		No	
Basement Room 13	9570523	1:00 pm	3:00 pm	1.4	1.5	No	6.7%
Basement Room 13	9570522	1:00 pm	3:00 pm	1.5		No	
Basement Room 14	9570520	1:00 pm	3:00 pm	0.9	0.9	No	11.1%
Basement Room 14	9570519	1:00 pm	3:00 pm	0.8		No	
Room 29	9570521	1:00 pm	3:00 pm	2.8	2.6	No	15.4%
Room 29	9570517	1:00 pm	3:00 pm	2.4		No	
Teachers Lounge	9570506	12:00 pm	2:00 pm	0.5	0.7	No	57.1%
Teachers Lounge	9570501	12:00 pm	2:00 pm	0.9		No	
Main Office	9570507	1:00 pm	2:00 pm	0.6	0.6	No	0%
Main Office	9570514	1:00 pm	2:00 pm	0.6		No	
Gym South Wall	9570510	1:00 pm	2:00 pm	1.5	1.5	No	0%
Gym South Wall	9570512	1:00 pm	2:00 pm	1.5		No	
Gym East Wall	9570518	1:00 pm	3:00 pm	1.4	1.4	No	7.1%
Gym East Wall	9570513	1:00 pm	3:00 pm	1.3		No	

Average RPD for Duplicate Averages more than 3.9 pCi/L: 0
 In Compliance: Yes

As a means to determine any biases in the results, detectors were deployed but not opened. At the time of test retrieval of the regular test, the devices were removed from their packaging and sent to the laboratory for blind analysis. The results of these unexposed devices are shown in Table 3. As can be seen, the laboratory reported these at the lower level of detection, indicating that no biases were introduced in handling and shipping of the devices.

Table 3: Blanks:

Room	Blank #	Kit ID #	Result (pCi/L)	In Compliance?
Room 12	1	9570527	< 0.3	Yes
Room 29	2	9570528	< 0.3	Yes

Key:

pCi/L: Picocuries per liter – units of radon concentration.

Average (Avg): Cumulative average of the entire period since the test started.

Please contact me if you have any questions.

Thank you,

Wade Gervais
Division Manager
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Cascade Radon, Inc.
NEHA/NRPP# 106213RMT

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Kit Number	Start Date	Start Time	End Date	End Time	Temp.	Facility	Building	Room	Project ID	Floor	Result
1570501	2021-03-01	12:00 pm	2021-03-05	2:00 pm	70	COLUMBIA CITY ELEMENTARY		TEACHERS LOUNGE	COLUMBIA CITY ELEMENTARY 20-C077W	1	0.9
1570502	2021-03-01	1:00 pm	2021-03-05	2:00 pm	70	COLUMBIA CITY ELEMENTARY		NORTH BASEMENT	COLUMBIA CITY ELEMENTARY 20-C077W	0	1.1
1570506	2021-03-01	12:00 pm	2021-03-05	2:00 pm	70	COLUMBIA CITY ELEMENTARY		TEACHERS LOUNGE	COLUMBIA CITY ELEMENTARY 20-C077W	1	0.5
1570507	2021-03-01	1:00 pm	2021-03-05	2:00 pm	70	COLUMBIA CITY ELEMENTARY		MAIN OFFICE	COLUMBIA CITY ELEMENTARY 20-C077W	1	0.6
1570508	2021-03-01	1:00 pm	2021-03-05	2:00 pm	70	COLUMBIA CITY ELEMENTARY		NORTH BASEMENT	COLUMBIA CITY ELEMENTARY 20-C077W	0	1.1
1570509	2021-03-01	1:00 pm	2021-03-05	2:00 pm	70	COLUMBIA CITY ELEMENTARY		SOUTH BASEMENT	COLUMBIA CITY ELEMENTARY 20-C077W	0	1.5
1570510	2021-03-01	1:00 pm	2021-03-05	2:00 pm	70	COLUMBIA CITY ELEMENTARY		GYM SOUTH WALL	COLUMBIA CITY ELEMENTARY 20-C077W	0	1.5
1570511	2021-03-01	1:00 pm	2021-03-05	2:00 pm	70	COLUMBIA CITY ELEMENTARY		SOUTH BASEMENT	COLUMBIA CITY ELEMENTARY 20-C077W	0	1.5
1570512	2021-03-01	1:00 pm	2021-03-05	2:00 pm	70	COLUMBIA CITY ELEMENTARY		GYM SOUTH WALL	COLUMBIA CITY ELEMENTARY 20-C077W	0	1.5
1570513	2021-03-01	1:00 pm	2021-03-05	3:00 pm	70	COLUMBIA CITY ELEMENTARY		GYM EAST WALL	COLUMBIA CITY ELEMENTARY 20-C077W	0	1.3
1570514	2021-03-01	1:00 pm	2021-03-05	2:00 pm	70	COLUMBIA CITY ELEMENTARY		MAIN OFFICE	COLUMBIA CITY ELEMENTARY 20-C077W	1	0.6
1570515	2021-03-01	1:00 pm	2021-03-05	3:00 pm	70	COLUMBIA CITY ELEMENTARY		BASEMENT ROOM 12	COLUMBIA CITY ELEMENTARY 20-C077W	0	0.7
1570516	2021-03-01	1:00 pm	2021-03-05	3:00 pm	70	COLUMBIA CITY ELEMENTARY		BASEMENT ROOM 12	COLUMBIA CITY ELEMENTARY 20-C077W	0	0.9
1570517	2021-03-01	1:00 pm	2021-03-05	3:00 pm	70	COLUMBIA CITY ELEMENTARY		29	COLUMBIA CITY ELEMENTARY 20-C077W	1	2.4
1570518	2021-03-01	1:00 pm	2021-03-05	3:00 pm	70	COLUMBIA CITY ELEMENTARY		GYM EAST WALL	COLUMBIA CITY ELEMENTARY 20-C077W	0	1.4
1570519	2021-03-01	1:00 pm	2021-03-05	3:00 pm	70	COLUMBIA CITY ELEMENTARY		BASEMENT ROOM 14	COLUMBIA CITY ELEMENTARY 20-C077W	0	0.8
1570520	2021-03-01	1:00 pm	2021-03-05	3:00 pm	70	COLUMBIA CITY ELEMENTARY		BASEMENT ROOM 14	COLUMBIA CITY ELEMENTARY 20-C077W	0	0.9
1570521	2021-03-01	1:00 pm	2021-03-05	3:00 pm	70	COLUMBIA CITY ELEMENTARY		29	COLUMBIA CITY ELEMENTARY 20-C077W	1	2.8
1570522	2021-03-01	1:00 pm	2021-03-05	3:00 pm	70	COLUMBIA CITY ELEMENTARY		BASEMENT ROOM 13	COLUMBIA CITY ELEMENTARY 20-C077W	0	1.5
1570523	2021-03-01	1:00 pm	2021-03-05	3:00 pm	70	COLUMBIA CITY ELEMENTARY		BASEMENT ROOM 13	COLUMBIA CITY ELEMENTARY 20-C077W	0	1.4
1570527	2021-03-01	1:00 pm	2021-03-05	3:00 pm	70	COLUMBIA CITY ELEMENTARY		BASEMENT ROOM 12 BLANK	COLUMBIA CITY ELEMENTARY 20-C077W	0	< 0.3
1570528	2021-03-01	1:00 pm	2021-03-05	3:00 pm	70	COLUMBIA CITY ELEMENTARY		RM 29 BLANK	COLUMBIA CITY ELEMENTARY 20-C077W	1	< 0.3

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