



CASCADE RADON, INC.

Testing, Mitigation,
Systems Design
CCB 180537 / CASCARI927C1

12839 NE Airport Way Bldg. 9
Portland, OR 97230
Phone: (503) 421-4813
Fax: (503) 281-6170
Office@CascadeRadon.com

Radon Survey Analysis
Job #18-C100R_2

for

Scappoose School District
Otto Petersen Elementary
c/o Jeff Andresen

property located at

52050 SE 3rd St

Scappoose, OR 97056

December 26, 2018



Introduction

The following report documents a study of radon levels for the property located at 52050 SE 3rd St, Scappoose, OR 97056. The goal of this study is to determine indoor radon levels for all areas in contact with the ground. Testing was performed per Oregon school testing protocol and EPA school testing 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 each building was set to occupied settings for the entirety of the testing period.

Conclusions and Recommendations

Test was a “Short-Term” test, with minimum duration of 72 hours. See the chart below of areas in buildings that were tested, and the corresponding levels found. Maps of the test levels are provided in Appendix A. All current test results are provided in Appendix B. Note that nineteen (21) of the 22 locations tested had results ABOVE the USEPA Action Level of 4.0 pCi/L.

It is recommended that a certified radon mitigation company be contacted to mitigate the elevated radon level bringing them below the EPA Action Level. While the EPA recommends buildings be fixed if the radon level is 4.0 pCi/L or more, because there is no known safe level of exposure to radon, EPA also suggests individuals consider fixing their buildings for radon levels between 2.0 pCi/L and 4.0 pCi/L.

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 (26) AirChek activated charcoal kits.

Test Start Date: 12/11/2018

Test End Date: 12/14/2018

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)
Community room	1	Duplicate Avg*	4:07PM	3:21PM	7.2
Speech	1	Duplicate Avg*	4:08PM	3:30PM	8.6
SpED	1	9132154	4:00PM	3:15PM	4.1
Practice Room	1	9132155	4:14PM	3:28PM	5.6
Nurse's Office	1	9132156	3:38PM	3:22PM	6.3
Nurse	1	9132157	3:39PM	3:22PM	9.2
Office 151	1	9132158	3:48PM	3:24PM	7.9
Break Room	1	9132159	3:36PM	3:19PM	6.4
Front Desk	1	9132160	3:50PM	3:25PM	4.7
Conference Room	1	9132161	3:52PM	3:21PM	7.7
Music room	1	9132163	4:12PM	3:27PM	5.5
Main office	1	9132164	3:47PM	3:24PM	6.8
Music office	1	9132165	4:12PM	3:27PM	7.0
Behavior office	1	9132166	3:54PM	3:17PM	5.6
Title 1	1	9132167	3:24PM	3:13PM	2.2
169	1	9132168	3:29PM	3:18PM	5.5
Behavior	1	9132169	3:21PM	3:15PM	5.2
Life skills	1	9132170	3:33PM	3:32PM	6.7
Iss	1	9132171	3:41PM	3:23PM	4.4
Principal's Office	1	9132172	3:43PM	3:34PM	15.9

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 4.0, should be within 25%. The results of the collated duplicates are provided in **Table 2**. The applicable ARPDP 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%
Community room	9132162	4:06PM	3:21PM	7.5	7.2	Yes	8.3
	9128478	4:07PM	3:21PM	6.9			
Speech	9128492	4:08PM	3:30PM	8.5	8.6	Yes	2.3
	9128480	4:09PM	3:30PM	8.7			
Average RPD for Duplicate Averages more than 3.9 pCi/L:							5.3
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?
Behavior room	1	9132108	0.3	Yes

A device was also selected from the lot of detectors that were utilized for exposure to a known radon environment at a spiking chamber (Bowser-Morner, NEHANRPP ID# 101 TC). After exposure, the device was submitted as a blind measurement to the laboratory. A comparison of the reported reading from the lab and the known concentration in the chamber is as follows:

Chamber concentration to which device was exposed:	32.6 pCi/L
Concentration reported by lab:	34.1
Relative percent difference (RPD):	4.5

The RPD between the reported and spiking concentration is well within normal limits.

Key:

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

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

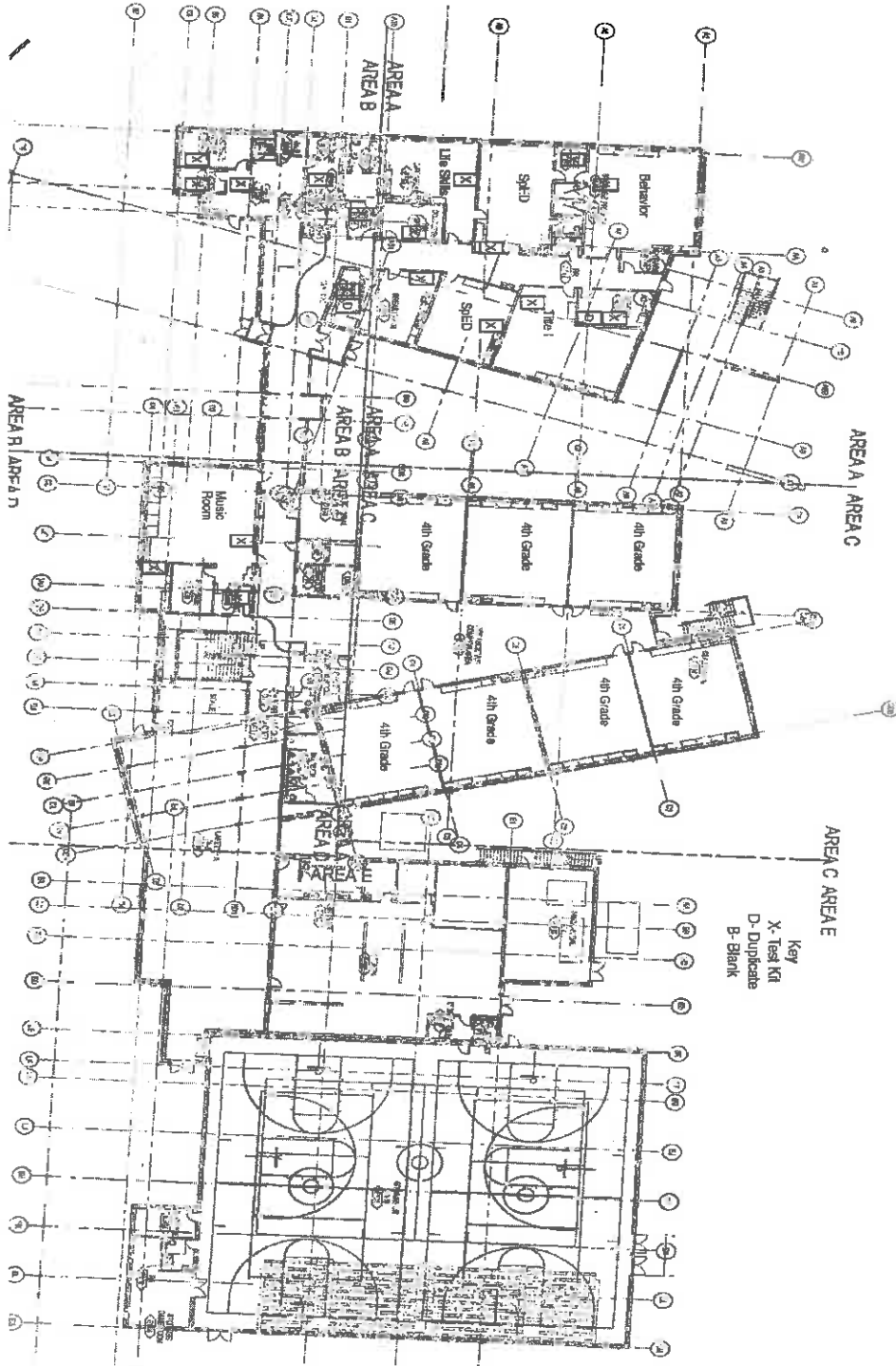
Please contact me if you have any questions.

Thank you,

Tamara Linde
NRPP 108246 RT

It is recommended that a certified radon mitigation company be contacted to evaluate the areas which are elevated to determine appropriate mitigation action to bring them below the USEPA Action Level.

Test Location Map



Test Results Map

