



January 2, 2024

Joe Crelier
Director of Risk Management
Portland Public Schools

Via email: jcrelier@pps.net

Regarding: Electronic Radon Monitor Results
Ockley Green Middle School
6031 N Montana Avenue
Portland, Oregon
PBS Project 25000.241

Mr. Crelier:

In February and March 2023, PBS performed short-term radon monitoring at Ockley Green Middle School at the request of Portland Public Schools. Results of short-term testing identified elevated radon in select areas. In April 2023, PBS performed follow-up testing in those areas with electronic Continuous Radon Monitors (CRMs) to determine hour-by-hour radon concentrations and provide additional information on mitigation strategies. In December 2023, PBS performed an additional round of CRM testing, the results of which are presented below.

METHODOLOGY

The Environmental Protection Agency (EPA) recommends, and the Oregon Health Authority (OHA) requires, that school buildings be tested for radon, and that any radon concentrations be maintained below 4.0 picocuries per liter (pCi/L) of air. PBS used Sun Nuclear 1028 CRMs to monitor in select areas and identify the dynamics of radon concentration over time.

Testing was conducted during the winter heating season while school was out of session, due to the difficulties of deploying the CRM in a busy occupied gym. Building HVAC systems for the gym and industrial arts areas were set to normal operating parameters. Occupied hours were considered to be 6:00 AM to 6:00 PM and unoccupied hours were 6:00 PM to 6:00 AM. PBS understands that this part of the school already has an active radon mitigation system installed, and that it has been adjusted and ensured to be operational since initial test results in March 2023 identified elevated radon.

RESULTS

The following table lists the results of radon concentrations at all tested locations.

Table 1: CRM Data Summary

Facility	Location	Test Dates	Overall Average Radon Level*	Average Radon Level During Occupied Hours*	Average Radon Level During Unoccupied Hours*	Average Identified During Feb/Mar 2023 Short-Term Testing*	Average Identified During April 2023 CRM Testing*
Ockley Green	Gym	12/26-12/29	2.6	3.2	1.7	6.1	4.6
Ockley Green	Industrial Arts	12/26-12/29	1.3	1.3	1.3	4.6	2.5

* - units are pCi/L

Overall, concentrations were found to be lower than during initial testing and during the April 2023 follow up testing. Concentrations were below the EPA action level of 4.0 pCi/L in all locations. PBS found concentrations to remain consistent in the Industrial Arts (Dance Studio) area throughout the tested period. Concentrations in the Gym started quite high and rapidly fell during the testing period, which is likely due to the buildings HVAC and radon mitigation system being turned on during the morning of 12/26 after a long dormant holiday period. This suggests that radon concentrations in the gym will increase during dormant building periods and decrease during normal occupied periods of time, and should remain below 4.0 during normal occupancy. The lower average levels found during this testing suggest that the building area's radon mitigation system is working as intended.

See the attached CRM printouts for additional information on each test.

LIMITATIONS OF SCOPE

This study was limited to the tests and locations as previously indicated. The site as a whole may have other environmental concerns that will not be characterized by this study. PBS is not able to represent conditions on the site or adjoining sites beyond those detected or observed by PBS.

Please feel free to contact me at 503.515.7489 or james.mastanduno@pbsusa.com with any questions or comments.

Sincerely,



James Mastanduno
Project Manager

Attachment: Individual Summary Reports

Radon Inspection Report

Test Location:

Ockley Green Middle School
6031 N Montana Avenue
Portland, OR 97217

Test For:

Type: Screening

Inspected By:

James Mastanduno, PBS Engineering
YOUR ADDRESS1, YOUR ADDRESS2
YOUR CITY, YOUR STATE YOUR ZIP
123-456-7890

Bldg. Type: Educational

Test Result: Pass

Overall Average:

2.6 pCi/l

EPA Average:

2.3 pCi/l

Test Device Details:

Serial Number: 238738012
Model Number: 1028XP
Last Calibration: 11/29/2023
Next Calibration: 11/29/2024
Cal-Factors: 2.89
Motion Error: Yes

Test Site Condition:

Condition: Raining

Test Summary:

<u>CRM Location:</u>	<u>Start:</u>	<u>Stop:</u>	<u>Interval:</u>	<u>Duration:</u>
Gym	12/26/2023 07:53 AM	12/29/2023 08:53 AM	1 hr	73 hr
*First 4 hrs of data excluded	<u>Min:</u>	<u>Max:</u>	<u>Average:</u>	<u>Measurement Units:</u>
Radon Concentration:	0.0	15.9	2.3	pCi/l

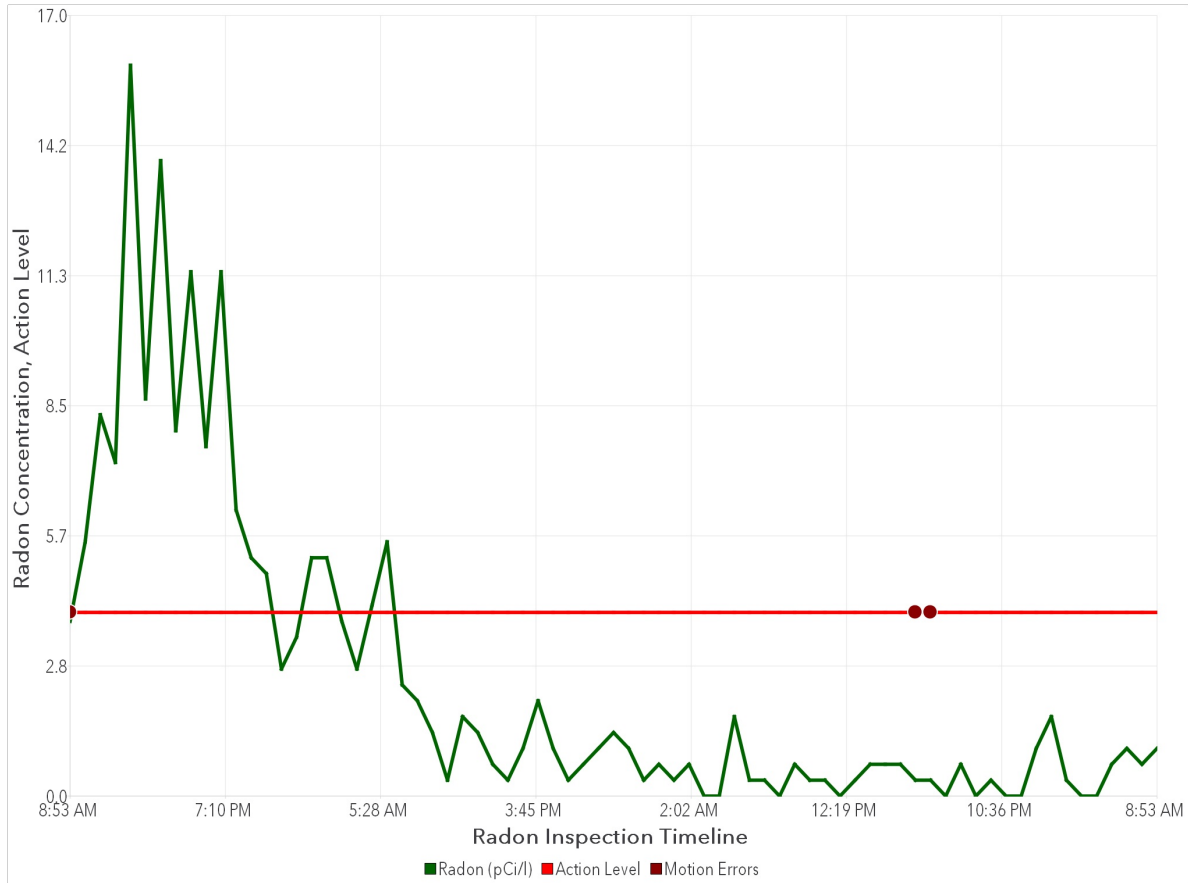
Comments:

Lic/Cert Signature

Test device manufactured by SunRADON, LLC

Inspection Report Date: 01/02/2024

Radon Inspection Chart



Test Result: Pass

Test Location: 6031 N Montana Avenue Portland, OR 97217

Inspection Report Date: 01/02/2024

Test device manufactured by SunRADON, LLC

Test Checklist

- ☒ The location of the detector was selected so the detector was not to be disturbed during testing.
- ☒ The monitor was not placed in an area of high humidity such as: Kitchen, laundry room, cellar, spa room, garage, crawl space or sump area.
- ☒ The detector was not located near drafts caused by HVAC vents, windows and doors.
- ☒ The detector was not placed near areas of excessive heat, such as a fireplace or in direct sunlight.
- ☒ The detector was placed within the breathing zone of at least 20 inches to 6 feet above the floor and at least 1 foot below the ceiling if suspended.
- ☒ The detector was not placed within 1 foot of outside walls of the home or within 3 feet of any windows or doors to the exterior of the home.

Test Result: Pass

Test Location: 6031 N Montana Avenue Portland, OR 97217

Inspection Report Date: 01/02/2024

Test device manufactured by SunRADON, LLC

Test Table

* Data from first 4 hours excluded from EPA calculations

<u>Date/Time</u>	<u>Radon(pCi/l)</u>	<u>Flags</u>
12/26/23 08:53 AM	3.8	M
12/26/23 09:53 AM	5.5	-
12/26/23 10:53 AM	8.3	-
12/26/23 11:53 AM	7.3	-
12/26/23 12:53 PM	15.9	-
12/26/23 01:53 PM	8.7	-
12/26/23 02:53 PM	13.8	-
12/26/23 03:53 PM	8.0	-
12/26/23 04:53 PM	11.4	-
12/26/23 05:53 PM	7.6	-
12/26/23 06:53 PM	11.4	-
12/26/23 07:53 PM	6.2	-
12/26/23 08:53 PM	5.2	-
12/26/23 09:53 PM	4.8	-
12/26/23 10:53 PM	2.8	-
12/26/23 11:53 PM	3.5	-
12/27/23 12:53 AM	5.2	-
12/27/23 01:53 AM	5.2	-
12/27/23 02:53 AM	3.8	-
12/27/23 03:53 AM	2.8	-
12/27/23 04:53 AM	4.2	-
12/27/23 05:53 AM	5.5	-
12/27/23 06:53 AM	2.4	-
12/27/23 07:53 AM	2.1	-
12/27/23 08:53 AM	1.4	-
12/27/23 09:53 AM	0.3	-
12/27/23 10:53 AM	1.7	-
12/27/23 11:53 AM	1.4	-
12/27/23 12:53 PM	0.7	-
12/27/23 01:53 PM	0.3	-
12/27/23 02:53 PM	1.0	-
12/27/23 03:53 PM	2.1	-
12/27/23 04:53 PM	1.0	-
12/27/23 05:53 PM	0.3	-
12/27/23 06:53 PM	0.7	-
12/27/23 07:53 PM	1.0	-
12/27/23 08:53 PM	1.4	-
12/27/23 09:53 PM	1.0	-
12/27/23 10:53 PM	0.3	-
12/27/23 11:53 PM	0.7	-
12/28/23 12:53 AM	0.3	-
12/28/23 01:53 AM	0.7	-
12/28/23 02:53 AM	0.0	-
12/28/23 03:53 AM	0.0	-

Test Result: Pass

Test Location: 6031 N Montana Avenue Portland, OR 97217

Inspection Report Date: 01/02/2024

Test device manufactured by SunRADON, LLC

Test Table

* Data from first 4 hours excluded from EPA calculations

<u>Date/Time</u>	<u>Radon(pCi/l)</u>	<u>Flags</u>
12/28/23 04:53 AM	1.7	-
12/28/23 05:53 AM	0.3	-
12/28/23 06:53 AM	0.3	-
12/28/23 07:53 AM	0.0	-
12/28/23 08:53 AM	0.7	-
12/28/23 09:53 AM	0.3	-
12/28/23 10:53 AM	0.3	-
12/28/23 11:53 AM	0.0	-
12/28/23 12:53 PM	0.3	-
12/28/23 01:53 PM	0.7	-
12/28/23 02:53 PM	0.7	-
12/28/23 03:53 PM	0.7	-
12/28/23 04:53 PM	0.3	M
12/28/23 05:53 PM	0.3	M
12/28/23 06:53 PM	0.0	-
12/28/23 07:53 PM	0.7	-
12/28/23 08:53 PM	0.0	-
12/28/23 09:53 PM	0.3	-
12/28/23 10:53 PM	0.0	-
12/28/23 11:53 PM	0.0	-
12/29/23 12:53 AM	1.0	-
12/29/23 01:53 AM	1.7	-
12/29/23 02:53 AM	0.3	-
12/29/23 03:53 AM	0.0	-
12/29/23 04:53 AM	0.0	-
12/29/23 05:53 AM	0.7	-
12/29/23 06:53 AM	1.0	-
12/29/23 07:53 AM	0.7	-
12/29/23 08:53 AM	1.0	-

Test Result: Pass

Test Location: 6031 N Montana Avenue Portland, OR 97217

Inspection Report Date: 01/02/2024

Test device manufactured by SunRADON, LLC

Radon Test Information

Radon Risk Information

Radon causes lung cancer by means of the decay of its daughter products after breathing in air contaminated with higher levels of Radon. The World Health Organization (WHO) estimates that 15% of lung cancers worldwide are caused by exposure to elevated indoor levels of Radon. Overall, radon is the second leading cause of lung cancer responsible for about 21,000 lung cancer deaths every year in the US alone. Radon gas is the number one cause of lung cancer among non-smokers. The U.S. Environmental Protection Agency (EPA), the U.S. Surgeon General, and the Center for Disease Control and Prevention (CDC) strongly recommend that ALL homebuyers have an indoor radon test performed prior to purchase or taking occupancy and recommend having the radon levels professionally mitigated if elevated radon concentrations are found.

Understanding Radon Test Results

Recommended Action Levels vary by country and typically range from 3 pCi/l (100 Bq/m³) to 8 pCi/l (300 Bq/m³). Recommendations below are based on test results by a Continuous Radon Monitor (CRM) Test of at least 48h duration and are based on recommendations by the EPA.

Measured Average Radon Level:

- At or above 4.0 pCi/l (148 Bq/m³): Corrective measures to reduce exposure to radon gas is strongly recommended (ANSI MAH2014)
- Between 2-4 pCi/l (74-148 Bq/m³): Consider mitigation or periodic retest as indoor Radon levels vary by season and weather conditions
- Below 2 pCi/l (74 Bq/m³): Consider bi-annual retest or whenever significant changes to the home structure or mechanical systems occurred

Test Result: Pass

Test Location: 6031 N Montana Avenue Portland, OR 97217

Inspection Report Date: 01/02/2024

Test device manufactured by SunRADON, LLC

Radon Inspection Report

Test Location:

Ockley Green Middle School
6031 N Montana Avenue
Portland, OR 97217

Test For:

Type: Screening

Inspected By:

James Mastanduno, PBS Engineering
YOUR ADDRESS1, YOUR ADDRESS2
YOUR CITY, YOUR STATE YOUR ZIP
123-456-7890

Bldg. Type: Educational

Test Result: Pass

Overall Average:

1.3 pCi/l

EPA Average:

1.2 pCi/l

Test Device Details:

Serial Number: 238348024
Model Number: 1028XP
Last Calibration: 10/18/2023
Next Calibration: 10/18/2024
Cal-Factors: 2.55
Motion Error: Yes

Test Site Condition:

Condition: Raining

Test Summary:

<u>CRM Location:</u>	<u>Start:</u>	<u>Stop:</u>	<u>Interval:</u>	<u>Duration:</u>
Industrial Arts/Dance Studio	12/26/2023 08:00 AM	12/29/2023 09:00 AM	1 hr	73 hr
*First 4 hrs of data excluded	<u>Min:</u>	<u>Max:</u>	<u>Average:</u>	<u>Measurement Units:</u>
Radon Concentration:	0.0	3.9	1.2	pCi/l

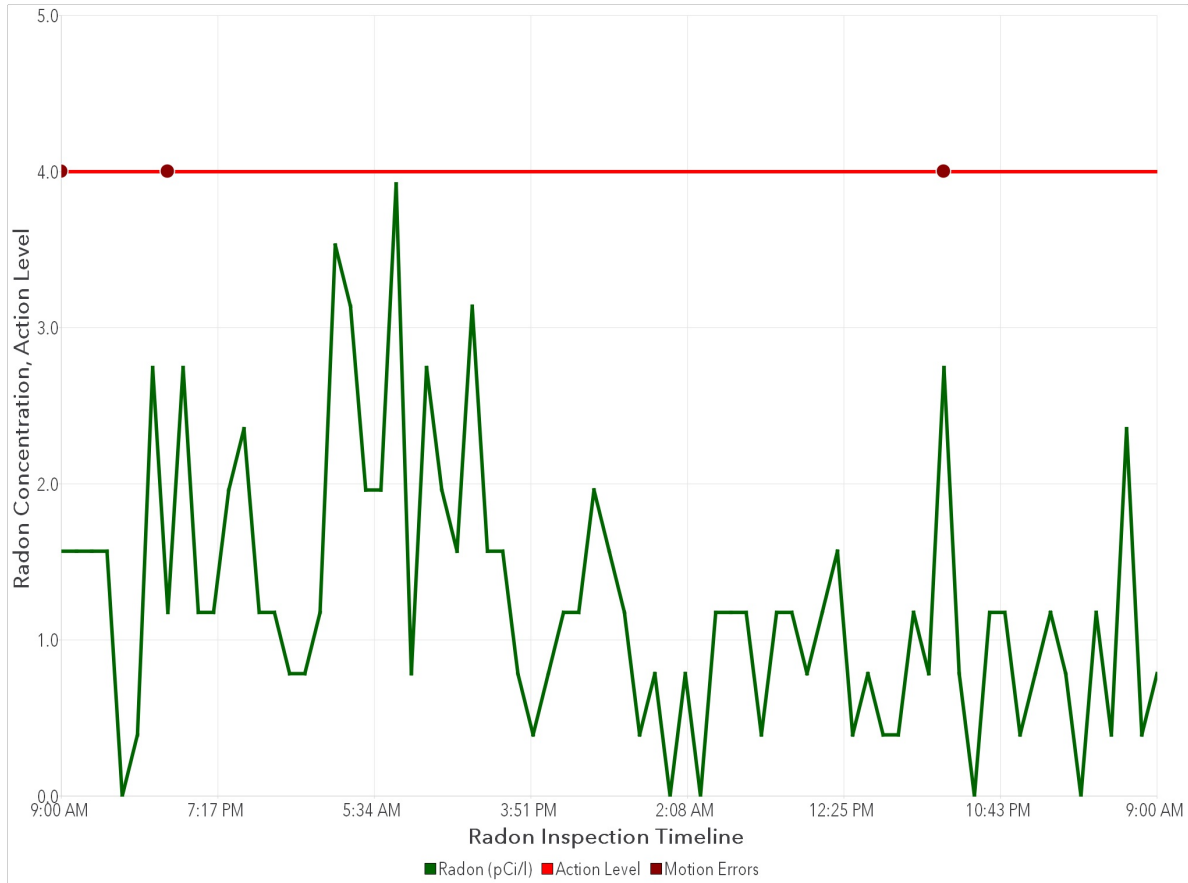
Comments:

Lic/Cert Signature

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Radon Inspection Chart



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<u>Date/Time</u>	<u>Radon(pCi/l)</u>	<u>Flags</u>
12/26/23 09:00 AM	1.6	M
12/26/23 10:00 AM	1.6	-
12/26/23 11:00 AM	1.6	-
12/26/23 12:00 PM	1.6	-
12/26/23 01:00 PM	0.0	-
12/26/23 02:00 PM	0.4	-
12/26/23 03:00 PM	2.7	-
12/26/23 04:00 PM	1.2	M
12/26/23 05:00 PM	2.7	-
12/26/23 06:00 PM	1.2	-
12/26/23 07:00 PM	1.2	-
12/26/23 08:00 PM	2.0	-
12/26/23 09:00 PM	2.4	-
12/26/23 10:00 PM	1.2	-
12/26/23 11:00 PM	1.2	-
12/27/23 12:00 AM	0.8	-
12/27/23 01:00 AM	0.8	-
12/27/23 02:00 AM	1.2	-
12/27/23 03:00 AM	3.5	-
12/27/23 04:00 AM	3.1	-
12/27/23 05:00 AM	2.0	-
12/27/23 06:00 AM	2.0	-
12/27/23 07:00 AM	3.9	-
12/27/23 08:00 AM	0.8	-
12/27/23 09:00 AM	2.7	-
12/27/23 10:00 AM	2.0	-
12/27/23 11:00 AM	1.6	-
12/27/23 12:00 PM	3.1	-
12/27/23 01:00 PM	1.6	-
12/27/23 02:00 PM	1.6	-
12/27/23 03:00 PM	0.8	-
12/27/23 04:00 PM	0.4	-
12/27/23 05:00 PM	0.8	-
12/27/23 06:00 PM	1.2	-
12/27/23 07:00 PM	1.2	-
12/27/23 08:00 PM	2.0	-
12/27/23 09:00 PM	1.6	-
12/27/23 10:00 PM	1.2	-
12/27/23 11:00 PM	0.4	-
12/28/23 12:00 AM	0.8	-
12/28/23 01:00 AM	0.0	-
12/28/23 02:00 AM	0.8	-
12/28/23 03:00 AM	0.0	-
12/28/23 04:00 AM	1.2	-

Test Result: Pass

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Test Table

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<u>Date/Time</u>	<u>Radon(pCi/l)</u>	<u>Flags</u>
12/28/23 05:00 AM	1.2	-
12/28/23 06:00 AM	1.2	-
12/28/23 07:00 AM	0.4	-
12/28/23 08:00 AM	1.2	-
12/28/23 09:00 AM	1.2	-
12/28/23 10:00 AM	0.8	-
12/28/23 11:00 AM	1.2	-
12/28/23 12:00 PM	1.6	-
12/28/23 01:00 PM	0.4	-
12/28/23 02:00 PM	0.8	-
12/28/23 03:00 PM	0.4	-
12/28/23 04:00 PM	0.4	-
12/28/23 05:00 PM	1.2	-
12/28/23 06:00 PM	0.8	-
12/28/23 07:00 PM	2.7	M
12/28/23 08:00 PM	0.8	-
12/28/23 09:00 PM	0.0	-
12/28/23 10:00 PM	1.2	-
12/28/23 11:00 PM	1.2	-
12/29/23 12:00 AM	0.4	-
12/29/23 01:00 AM	0.8	-
12/29/23 02:00 AM	1.2	-
12/29/23 03:00 AM	0.8	-
12/29/23 04:00 AM	0.0	-
12/29/23 05:00 AM	1.2	-
12/29/23 06:00 AM	0.4	-
12/29/23 07:00 AM	2.4	-
12/29/23 08:00 AM	0.4	-
12/29/23 09:00 AM	0.8	-

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