

September 15, 2022

Brent Paul, Director of Facility Operations Lake Oswego School District 2455 Country Club Road Lake Oswego, Oregon 97034

Via email: paulb@loswego.k12.or.us

Regarding: Radon Testing

Oak Creek Elementary School

55 Kingsgate Road

Lake Oswego, Oregon 97035

PBS Project 21600.051

Dear Mr. Paul:

From March 7 to March 9, 2022, PBS Engineering and Environmental Inc. (PBS) performed short-term radon testing at Oak Creek Elementary School located at 55 Kingsgate Road in Lake Oswego, Oregon.

The Environmental Protection Agency (EPA) and Oregon Health Authority (OHA) recommend that buildings be tested for radon and that any radon concentrations be maintained below 4.0 picocuries per liter (pCi/L) of air.

PBS used Radonova brand activated charcoal adsorption detector short-term radon test kits to measure radon levels in frequently occupied rooms that are in contact with the ground or above unoccupied basements or crawl spaces. The test kits were shipped under chain-of-custody to Alpha Energy Laboratories (National Radon Proficiency Program ID: 101132 AL) for analysis.

Laboratory results indicated that all short-term radon tests at Oak Creek Elementary were below 4.0 pCi/L.

See the attached laboratory analysis report for sample locations and additional details.

In addition to the EPA recommendation that radon concentrations do not exceed 4.0 pCi/L, OHA recommends that the following steps be conducted based on the results of a room's initial short-term test:

- **If the result is less than 2.0 pCi/L,** school districts are required to test again every 10 years, per Oregon Revised Statute 332.166-167.
- If the result is between 2.0 pCi/L and 4.0 pCi/L, consider fixing (i.e., lowering) the radon in that room.
- If the result is from 4.0 pCi/L to 8.0 pCi/L, perform a follow-up measurement of that room using a long-term test. This test should be conducted over as much of a nine-month school year as possible, when the room is likely to be occupied. If that result is equal to or greater than 4.0 pCi/L, the radon in the room should be fixed (i.e., lowered).
- If the initial short-term test result is equal to or greater than 8.0 pCi/L, conduct a second short-term test and average its result with the initial short-term test result. If the average of the two is equal to or greater than 4.0 pCi/L, radon in the room should be fixed (i.e., lowered).

Lake Oswego School District Radon Testing, Oak Creek Elementary School September 15, 2022 Page 2 of 2

Note: A great difference in the results of the short-term tests may indicate a flaw in the testing process. Investigate and consider retesting. For situations in which one of the test results is equal to or greater than 4.0 pCi/L, if the higher result is two or more times the lower result, repeat the 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. The findings and conclusions of this work are not scientific certainties, but probabilities based on professional judgment concerning the significance of the data gathered during the course of this investigation. 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 503.417.7607 or bob.kleckner@pbsusa.com with any questions or comments.

Sincerely,

Bob Kleckner Sr. Project Manager

Attachment: Floor Plan

Radonova Laboratory Analysis Radon Monitoring Report



DATE: SEPTEMBER 2022

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PREPARED FOR: LAKE OSWEGO SCHOOL DISTRICT #73



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PRINT DATE 05/12/2022 OWN ID

21600.051 Phase 0001

DV

PBS Engineering & Environmental

REPORT RECEIVER(S)

alex.johnson@pbsusa.com;lindsey.peterson@pbsusa.com Sam Eckes

Sam Eckes 97035

RADON MONITORING REPORT

Description of the measurement

The measurement was performed with an Activated Charcoal Adsorption detector (QuickScreen) and was analyzed by Alpha Energy Laboratories (NRPP ID: 101132 AL).

The detector(s) arrived to Alpha Energy Laboratories, Inc. **03/14/2022**. They were measured **03/14/2022**.

No person has signed the record card and verified that the instructions have been followed.

Property data and address

MEASURE SITE ADDRESS

Lake Oswego SD

55 Kingsgate Rd

Lake Oswego

BUILDING ID
Oak Creek ES

Test results

DETECTOR	MEASUREMENT PERIOD	DESCRIPTION / LOCATION	FLOOR	RADON RESULT
RB105161 [QuickScreen]	03/07/2022 06:34 AM - 03/09/2022 02:19 PM	General office, center	Second	< 0.6 pCi/L
RB105163 [QuickScreen]	03/07/2022 06:35 AM - 03/09/2022 02:19 PM	Principals office, table by door 50.4	Second	< 1.1 pCi/L
RB104832 [QuickScreen]	03/07/2022 06:37 AM - 03/09/2022 02:20 PM	50.5 office, desk by door	Second	< 1.4 pCi/L
RB105244 [QuickScreen]	03/07/2022 06:38 AM – 03/09/2022 02:20 PM	50.10 health room, on shelf above sink	Second	< 1.1 pCi/L
RB105448 [QuickScreen]	03/07/2022 06:39 AM - 03/09/2022 02:21 PM	Room attached to 50.10, on shelf	Second	< 1.5 pCi/L
RB104829 [QuickScreen]	03/07/2022 06:40 AM – 03/09/2022 02:22 PM	50.6 office, on bookshelf	Second	< 1.1 pCi/L
RB105419 [QuickScreen]	03/07/2022 06:41 AM – 03/09/2022 02:21 PM	work room, shelf with colored paper	Second	< 1.3 pCi/L

Comment to the results

This report replaces 6307034:1. Reason: new or corrected measurement information has been received.

Tryggve Rönnqvist (Electronically signed)

Signature Radonova Laboratories Laboratory Measurement Specialist

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MEASURE SITE ADDRESS Lake Oswego SD 55 Kingsgate Rd Lake Oswego

BUILDING ID

Oak Creek ES

DETECTOR	MEASUREMENT PERIOD	DESCRIPTION / LOCATION	FLOOR	RADON RESULT
RB105426 [QuickScreen]	03/07/2022 01:34 PM - 03/09/2022 09:19 PM	teacher lounge, bookshelf by door	Second	< 1.6 pCi/L
RB105219 [QuickScreen]	03/07/2022 07:14 AM – 03/09/2022 02:24 PM	CR 9, "by printer, northwest corner / fli	Second	< 1.2 pCi/L
RB104485 [QuickScreen]	03/07/2022 06:45 AM - 03/09/2022 02:25 PM	CR 8, on gray shelf northwest corner / fl	Second	< 1.0 pCi/L
RB105248 [QuickScreen]	03/07/2022 06:48 AM – 03/09/2022 02:27 PM	15.3, bookshelf by door	Second	< 0.9 pCi/L
RB105189 [QuickScreen]	03/07/2022 06:49 AM - 03/09/2022 02:27 PM	CR 15, bookshelf on south wall	Second	1.4 pCi/L
RB104834 [QuickScreen]	03/07/2022 06:51 AM - 03/09/2022 02:28 PM	15.1, desk by door	Second	1.0 pCi/L
RB105220 [QuickScreen]	03/07/2022 06:52 AM - 03/09/2022 02:29 PM	15.5, desk by door	Second	< 1.2 pCi/L
RB105250 [QuickScreen]	03/07/2022 06:53 AM – 03/09/2022 02:26 PM	15.2, desk by door	First	< 1.3 pCi/L

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RB105225 [QuickScreen]	03/07/2022 06:57 AM – 03/09/2022 02:45 PM	43, top bookshelf by window	First	1.6 pCi/L
RB104757 [QuickScreen]	03/07/2022 06:57 AM – 03/09/2022 02:45 PM	43, top bookshelf by window / DUP	First	< 1.3 pCi/L
RB105170 [QuickScreen]	03/07/2022 07:01 AM - 03/09/2022 02:54 PM	39 cust., by phone	First	< 1.4 pCi/L
RB104749 [QuickScreen]	03/07/2022 07:03 AM – 03/09/2022 02:49 PM	30 teacher planning, shelf by globe	First	< 1.0 pCi/L
RB105172 [QuickScreen]	03/07/2022 07:04 AM – 03/09/2022 02:52 PM	CR 29, east wall	First	< 1.0 pCi/L
RB105168 [QuickScreen]	03/07/2022 07:05 AM – 03/09/2022 02:51 PM	CR 28, east wall	First	< 1.1 pCi/L
RB105160 [QuickScreen]	03/07/2022 07:06 AM - 03/09/2022 02:53 PM	CR 27, bookshelf top west wall	First	< 1.3 pCi/L
RB105162 [QuickScreen]	03/07/2022 07:08 AM - 03/09/2022 02:50 PM	CR 26, west wall shelf	First	< 1.1 pCi/L

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DETECTOR	MEASUREMENT PERIOD	DESCRIPTION / LOCATION	FLOOR	RADON RESULT
RB104792 [QuickScreen]	03/07/2022 07:09 AM - 03/09/2022 02:47 PM	26.1	First	< 1.3 pCi/L
RB105438 [QuickScreen]	03/07/2022 07:11 AM - 03/09/2022 02:46 PM	Library, """R"" section shelf / flipped over	First	< 1.4 pCi/L
RB105423 [QuickScreen]	03/07/2022 07:11 AM - 03/09/2022 02:47 PM	Library, "next to ""W"""	First	< 1.4 pCi/L
RB104784 [QuickScreen]	03/07/2022 07:16 AM - 03/09/2022 02:43 PM	CR 25, black bookshelf	First	< 1.4 pCi/L
RB105231 [QuickScreen]	03/07/2022 07:16 AM - 03/09/2022 02:44 PM	CR 25, by door / DUP	First	< 1.6 pCi/L
RB105204 [QuickScreen]	03/07/2022 07:18 AM - 03/09/2022 02:42 PM	CR 24, top bookshelf by window	First	< 1.4 pCi/L
RB105166 [QuickScreen]	03/07/2022 07:19 AM - 03/09/2022 02:41 PM	45, shelf with basket	First	< 1.3 pCi/L
RB105404 [QuickScreen]	03/07/2022 07:22 AM – 03/09/2022 02:38 PM	CR 21, by phone	First	< 1.1 pCi/L

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including consequential damages, to persons or property resulting from the use of the monitor or the resulting data.

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DETECTOR	MEASUREMENT PERIOD	DESCRIPTION / LOCATION	FLOOR	RADON RESULT
RB104785 [QuickScreen]	03/07/2022 07:24 AM – 03/09/2022 02:35 PM	CR 19, top of shelf by sink	First	< 0.9 pCi/L
RB105356 [QuickScreen]	03/07/2022 07:26 AM – 03/09/2022 02:36 PM	CR 22, under phone	First	< 1.1 pCi/L
RB105203 [QuickScreen]	03/07/2022 07:28 AM – 03/09/2022 02:33 PM	CR 18, behind black cabinet	First	< 0.9 pCi/L
RB105388 [QuickScreen]	03/07/2022 07:29 AM – 03/09/2022 02:34 PM	CR 17, "gray shelf, southwest wall"	First	< 1.1 pCi/L
RB105222 [QuickScreen]	03/07/2022 07:31 AM – 03/09/2022 02:32 PM	CR 16, west wall shelf	First	< 1.1 pCi/L
RB105393 [QuickScreen]	03/07/2022 07:31 AM – 03/09/2022 02:32 PM	CR 16, west wall shelf / DUP	First	< 1.0 pCi/L
RB105391 [QuickScreen]	03/07/2022 07:33 AM – 03/09/2022 02:31 PM	CR 23, high on northeast shelf	First	< 1.1 pCi/L
RB105433 [QuickScreen]	03/07/2022 07:37 AM – 03/09/2022 02:56 PM	CR 32 music, by desk	First	< 1.4 pCi/L

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DETECTOR	MEASUREMENT PERIOD	DESCRIPTION / LOCATION	FLOOR	RADON RESULT
RB105230 [QuickScreen]	03/07/2022 07:39 AM – 03/09/2022 02:57 PM	CR 34, on top of cabinet	First	< 1.1 pCi/L
RB105374 [QuickScreen]	03/07/2022 07:41 AM – 03/09/2022 02:59 PM	Gym office, on desk by phone	First	< 1.3 pCi/L
RB105414 [QuickScreen]	03/07/2022 07:42 AM – 03/09/2022 02:59 PM	Gym, red moulding (high)	First	< 1.9 pCi/L
RB105247 [QuickScreen]	03/07/2022 07:42 AM – 03/09/2022 03:00 PM	Gym, red moulding (high)	First	1.7 pCi/L
RB105377 [QuickScreen]	03/07/2022 07:42 AM – 03/09/2022 03:00 PM	Gym, red moulding (high) / DUP	First	1.5 pCi/L
rb102791 [QuickScreen]	03/07/2022 07:45 AM – 03/09/2022 03:01 PM	Kitchen, paper towel holder	First	DNR
RK109600 [QuickScreen]	03/07/2022 03:05 PM - 03/09/2022 03:05 PM	Field blank	First	< 0.8 pCi/L

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including consequential damages, to persons or property resulting from the use of the monitor or the resulting data.

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Oak Creek ES

DETECTOR	MEASUREMENT PERIOD	DESCRIPTION / LOCATION	FLOOR	RADON RESULT
RK109589 [QuickScreen]	03/07/2022 03:05 PM – 03/09/2022 03:05 PM	Field blank	First	< 1.0 pCi/L
RK109662 [QuickScreen]	03/07/2022 03:05 PM – 03/09/2022 03:05 PM	Field blank	First	< 1.0 pCi/L

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Measurement method: Activated Charcoal Adsorption

For this method using the QuickScreen detector, the airtight container with activated charcoal is opened in the area to be sampled and radon in the air adsorbs onto the charcoal granules. At the end of the sampling period, the container is sealed and may be sent to a laboratory for analysis. The gamma decay from the radon adsorbed to the charcoal is counted on a scintillation detector and a calculation based on calibration information is used to calculate the radon concentration at the sample site.

Measured radon concentrations

For each detector, the measured value of the radon concentration is provided. For each value an uncertainty associated with the measurement to a 95% confidence level is also provided. For example a measurement result of 4.0 ± 0.5 pCi/L means that the radon concentration is most likely contained in the range 3.5 - 4.5 pCi/L. If the start or end date of the measurement has not been provided, the radon concentration cannot be calculated. In such cases, the total exposure in pCi*days/L will be reported. The reported measured values are related to the detectors as received by Radonova Laboratories. Detector deployment is not performed by Radonova Laboratories. Measurement information such as monitoring period (dates) and placement location is provided to Radonova Laboratories by the end user.

Codes on non-reportable detectors

DNR Not Reported – Detector Not Returned

ERR Not Reported – See comment

Radon measurements in Multifamily Buildings, Schools and Large Buildings

The United States Environmental Protection Agency (EPA) recommends remediation if the results of one long-term test or the average of two short-term tests conducted in an occupied room are 4.0 pCi/L or higher. The average yearly residential indoor radon level in the US is estimated to be around 1.3 pCi/L. Long-term tests are conducted for more than 90 days. Short-term tests are conducted between 2 and 90 days and should be performed under closed building conditions.

If an initial short-term test result is less than 4 pCi/L, a follow-up measurement is probably not needed.

If an initial short-term test result is between 4 pCi/L and 8 pCi/L, a long-term or a short-term follow-up measurement is recommended.

If an initial short-term test result is greater than 8 pCi/L, a short term follow-up measurement is recommended in order to get a fast result.

More information about radon measurements and mitigation can be found in the AARST and EPA publications:

- ANSI/AARST Protocol for Conducting Measurements of Radon and Radon-Decay Products in Schools and Large Buildings.
- ANSI/AARST Protocol for Conducting Radon and Radon Decay Product Measurements in Multifamily Buildings.
- ANSI/AARST Radon Mitigation Standards for Schools and Large Buildings.
- ANSI/AARST Radon Mitigation Standards for Multifamily Buildings.
- EPA Radon Measurements in Schools, EPA 402-R-92-014, July 1993.

For more information about the interpretation of your test results or about other radon related issues we suggest contacting your state radon office.

Signature on the report

With the signature on the report, the Measurement specialist at Radonova Laboratories certifies that the quality control procedures follows the guidance in accordance with EPA 402-R-95-012. Measurement information displayed in italics on report has been provided by the customer.

Certification no:

101132-AL, 107830-RT, NY ELAP ID: 11430