



**Date:** 2/25/20  
**Performed by:** Andrew Tinklenberg  
**Location:** Plant Maintenance & Operations  
**RE:** Radon Testing

## INTRODUCTION

From October 31, 2019 – February 13, 2020, long-term radon testing was performed within the Plant Maintenance & Operations Building. The testing was performed in frequently-occupied ground contact rooms and rooms immediately above unoccupied spaces (crawl spaces and tunnels) that are in contact with the ground per the Environmental Protection Agency (EPA) and Minnesota Department of Health (MDH) guidelines.

## SUMMARY OF FINDINGS

All of the areas that were tested were found to have radon gas levels below 4.0 picocuries per liter of air (pCi/L), which is the EPA and MDH action level. The testing device in the pipe fitting shop was lost/removed and could not be submitted for analysis. Since the radon levels throughout the building were found to be very low, re-testing in the space is not necessary. (Note: Room B was the blank sample.)

Please refer to the attached Radonova radon testing report and sample diagram for further information concerning the radon testing, areas that were tested, and the radon levels that were found to be present. The information will be posted on the EH&S webpage available through the main MPS website and maintained on file by EH&S.

If you have any questions regarding this information, please feel free to contact me. Thank you,

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Minneapolis Public Schools  
1225 N. Seventh Street  
Minneapolis MN 55411

## RADON MONITORING REPORT

### Description of the measurement

The measurement was performed with a closed alpha-track detector (Radtrak<sup>2</sup>) following the quality guidance in EPA 402-R-95-012.

The detector(s) arrived to Radonova Laboratories AB **02/17/2020**.  
They were measured **02/22/2020**.

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

### Property data and address

MEASURE SITE ADDRESS

BUILDING ID

### Test results

DETECTOR	MEASUREMENT PERIOD	DESCRIPTION / LOCATION	RADON RESULT
113464-2	10/31/2019 – 02/13/2020	M&O Building, Electrical Office	1.6 ± 0.8 pCi/L
317124-6	10/31/2019 – 02/13/2020	M&O Building, Sign Shop	1.7 ± 0.8 pCi/L
394618-3	10/31/2019 – 02/13/2020	M&O Building, Painting/Glazing Shop	1.2 ± 0.8 pCi/L
395305-6	10/31/2019 – 02/13/2020	M&O Building, Material's Management Office	1.6 ± 0.8 pCi/L
395338-7	10/31/2019 – 02/13/2020	M&O Building, Sheet Metal Shop	1.1 ± 0.8 pCi/L
395672-9	10/31/2019 – 02/13/2020	M&O Building, Open Storage Area	1.3 ± 0.8 pCi/L
396291-7	10/31/2019 – 02/13/2020	M&O Building, Custodian Office	1.8 ± 0.8 pCi/L
396319-6	10/31/2019 – 02/13/2020	M&O Building, Break Room	1.1 ± 0.8 pCi/L
396971-4	10/31/2019 – 02/13/2020	M&O Building, Plumbing Shop	1.7 ± 0.8 pCi/L
397259-3	10/31/2019 – 02/13/2020	M&O Building, Mail Room	1.3 ± 0.8 pCi/L

### Comment to the results

#### Trygve Rönqvist (Electronically signed)

Signature Radonova Laboratories AB Laboratory Measurement Specialist

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Testing  
ISO/IEC 17025

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Minneapolis MN 55411

OWN ID  
Email Order - R.Brown

BY  
Minneapolis Public Schools

REPORT RECEIVER(S)  
MINNEAPOLIS PUBLIC SCHOOLS

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DETECTOR	MEASUREMENT PERIOD	DESCRIPTION / LOCATION	RADON RESULT
397806-1	10/31/2019 – 02/13/2020	M&O Building, Carpentry Shop	3.1 ± 0.9 pCi/L
429061-5	10/31/2019 – 02/13/2020	M&O Building, Shade Room	< 0.5 pCi/L
429562-2	10/31/2019 – 02/13/2020	M&O Building, Painting/Glazing Office	1.7 ± 0.8 pCi/L
430030-7	10/31/2019 – 02/13/2020	M&O Building, Plumbing Office	0.6 ± 0.5 pCi/L
430224-6	10/31/2019 – 02/13/2020	M&O Building, Room B	< 0.9 pCi/L
437615-8	10/31/2019 – 02/13/2020	M&O Building, Carpentry Office	< 0.9 pCi/L
437915-2	10/31/2019 – 02/13/2020	M&O Building, Lock Shop	1.6 ± 0.8 pCi/L
441521-2	10/31/2019 – 02/13/2020	M&O Building, Sprinkler Office	1.5 ± 0.8 pCi/L

### Comment to the results

#### Trygve Rönqvist (Electronically signed)

Signature Radonova Laboratories AB Laboratory Measurement Specialist

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### Measurement method: Closed alpha-track detector (Radtrak<sup>2</sup>®)

The radon measurement was performed with a closed alpha-track detector following the quality assurance guidance given in EPA 402-R-95-012. The detector container is manufactured from electrically conducting plastic. Through a small slit (filter), radon gas enters the detector. The track-detecting material (film) inside the detector is hit by alpha particles generated by the radon entering the container and the decay products formed from it. On the film, the alpha particles make small tracks which are enlarged through chemical etching and later counted in a microscope in order to determine the radon exposure.

Radonova Laboratories AB (P.O. Box 6522, SE-751 38 Uppsala, Sweden) is accredited (no. 1489) by SWEDAC to conduct radon-gas measurements using the closed alpha-track detector method. The analysis equipment is checked daily and the detectors are calibrated at regular intervals. NRPP Licenses: 107831 AL, 107830 RT

### 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 AB. Detector deployment is not performed by Radonova Laboratories AB. Measurement information such as monitoring period (dates) and placement location is provided to Radonova Laboratories AB by the end user.

### Codes on non-reportable detectors

DNR	Not Reported – Detector Not Returned
VTW	Not Reported – Visibly Tampered With
FBD	Not Reported – Film Broken or Damaged
LIL	Not Reported – Lost in Lab
DTO	Not Reported – Detector Too Old

### 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 person responsible for the radon analysis at Radonova Laboratories AB hereby certifies that the measurement procedures follows the guidance in accordance with EPA 402-R-95-012 and that the demands from SWEDAC are fulfilled.

### Certification no:



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