



MCPS RADON TESTING – EXECUTIVE SUMMARY

Site Name	Flora M. Singer Elementary School
Date of Test Report	5/11/2022
Round of Testing	Initial Follow-up Post Remediation 2 Year Testing 5 Year Testing HVAC Upgrade Window Replacement New Addition New Facility
# Rooms Tested	36
# Rooms \geq 4.0 pCi/L	0
Lowest Value	<0.3 pCi/L
Highest Value	3.0 pCi/L

Project Status:
Initial testing completed; No further action needed



May 11, 2022

Brian T. Croyle, PG, CHMM
Environmental Specialist
Montgomery County Public Schools
Gaithersburg, MD 20879

Re: **Radon Testing Services**
KCI Job # 122108316

Location: Flora M. Singer Elementary School
2600 Hayden Drive
Silver Spring, MD 20902

Dear Mr. Croyle:

KCI Technologies, Inc. (KCI) is pleased to submit the following report to Montgomery County Public Schools (MCPS) pursuant to completing a “short-term” 3 day radon test for the Flora M. Singer Elementary School, located at 2600 Hayden Drive, Silver Spring, MD 20902 (subject site).

Scope of Services:

KCI conducted radon testing at the subject site to evaluate indoor radon levels relative to the USEPA's recommended action level of 4.0 picocuries per Liter (pCi/L) - the level at which EPA recommends that schools take action to reduce the level. KCI conducted the radon testing in accordance with American Association of Radon Scientists and Technologists (AARST) *Protocol for Conducting Measurements of Radon and Radon Decay Products in Schools and Large Buildings*. A National Radon Proficiency Program (NRPP) Radon Measurement Specialist (certification #111004 RT) supervised the testing. Additional information on radon management and the health effects of radon exposure is available from <https://www.montgomeryschoolsmd.org> or www.epa.gov/radon.

KCI visited the site on March 22, 2022 and deployed forty-two (42) activated charcoal (AC) radon test kits. KCI deployed radon test kits in all frequently-occupied ground contact rooms, and other areas, (if applicable) in accordance with AARST guidance.

A floor plan map of the building with the test locations is included as Attachment A of this report.

As a quality control measure, KCI also included duplicate samples, field blanks, lab transit blanks, and office blanks in accordance with AARST recommendations. In addition, KCI submitted test kits to Bowser-Morner, Inc. as spike samples. The spiked tests were exposed to a known radon concentration by Bowser-Morner prior to being returned to the laboratory for analysis.

KCI returned to the site on March 25, 2022 to retrieve the radon sampling test kits. KCI shipped all radon tests via overnight delivery to Airchek, Inc. for analysis by gamma-ray spectroscopy. Airchek, Inc. is a

NRSB certified analytical laboratory for radon analysis (certification # ARL1402) located at 1936 Butler Bridge Road, Mills River, North Carolina.

Evaluation of Testing Conditions:

These tests represent:

- Follow-up to post-mitigation biennial testing.

These tests were conducted to:

- Confirm the success of the mitigation system(s).

According to AARST, *Protocol for Conducting Measurements of Radon and Radon Decay Products in Schools and Large Buildings*, ideal testing conditions would be when the building is fully occupied and the heating system is active. For this test, the facility’s HVAC system was operating in heating mode; therefore, KCI concludes that this test was conducted during ideal testing conditions.

KCI recorded observations of the following conditions in each room during the time of deployment and collection of the radon test kits:

- Indoor temperature,
- HVAC Operation,
- Dehumidifier operation,
- Humidifier operation,
- Ceiling fan operation, and
- Open windows or doors.

KCI also compiled weather data for the testing period and conducted observations of relevant field conditions. During the test period, weather records indicate low temperatures were in the low 40s and high temperatures ranged from the low 70s to the low 50s Fahrenheit. Maximum sustained winds ranged from 0-25 miles per hour. Average humidity was around 56% with 0.5 inches of precipitation (rain) was recorded during testing period.

Results:

The sampling locations and analytical results are listed on Table 1 (Attachment B). The quality control sample locations and analytical results are listed on Table 2 (Attachment B). Sampling locations and associated test kit identification numbers and relevant field observations are listed on Table 3 (Attachment B). The laboratory analytical results are included in Attachment C. Laboratory results and exposure data for the spike samples are also included in Attachment C.

The results of the radon test analysis indicated the following:

Radon Concentration	Room	Result
≥4.0 pCi/L	None	N/A
<4.0 pCi/L	See Attachment B	

Quality Control Samples	
Results of Blank Canisters:	The office blanks, and lab transit blanks had test results of less than the laboratory detection limit of 0.3 pCi/L.
Adequate Laboratory Precision?	Review of the duplicate sample analysis indicates that adequate laboratory measurement precision was achieved.
Spike Sample Analysis:	The Spike Sample analysis results indicate the laboratory is operating within statistical control limits.

Our professional services have been performed in accordance with customary principles and practices in the field of industrial hygiene and engineering. If you have any questions or comments regarding this report, please feel free to contact me at (410) 891-1769.

Sincerely,



Tyler P. McCleaf
Radon Measurement Provider
#111004 RT
KCI Technologies, Inc.

Attachments: A- Floor Plan with Test Locations
 B- Table 1-3, Radon Test Summary Spreadsheets
 C- Laboratory Analytical Results

ATTACHMENT A

Floor Plan With Test Locations

ATTACHMENT B

Radon Test Summary Spreadsheet

Table Notes:

AC- Activated Charcoal

ACI- Air Check, Inc.

D- Duplicate

FB- Field Blank

KCI- KCI Technologies, Inc.

OB- Office Blank

PM- Project Manager

OC- Quality Control

Table 1- Radon Testing Results		
Flora M. Singer ES		
Test Period: 03/22/2022 - 03/25/2022		
Kit Number	Room / Area	Result
11139085	7	0.8
11139084	11	< 0.3
11139086	11	1.7
11139088	15	2.2
11131664	19	0.9
11131699	21	1.3
11139099	22	3.0
11131696	23	1.8
11131666	24	1.9
11139087	27	1.1
11139094	28	2.2
11138930	29	1.3
11131672	35	1.1
11139095	35	0.7
11139100	39	2.8
11139096	43	1.6
11139093	45	1.7
11131670	49	2.1
11131679	100	0.7
11138901	102	< 0.3
11131698	104	1.1
11138903	104	0.9
11131678	106	0.9
11131685	108	0.8
11131697	109	< 0.3
11139079	201	1.0
11139092	201	0.9
11131686	220	1.7
11131680	222	1.2
11131677	100B	0.7
11131687	100C	0.6
11138902	100D	1.1
11131688	100J	0.8
11138937	101A	0.7
11131700	101B	0.9
11131673	102A	1.1
11131671	108A	< 0.3
11131695	GYM	1.0
11138955	GYM	< 0.3
11138959	GYM	0.8
11139070	GYM	< 0.3
11131665	GYM OFFICE	2.4

Table 2- Radon Testing Results			
Flora M. Singer ES			
Test Period: 03/22/2022 - 03/25/2022			
Kit Number	QC Type	Room / Area	Result
11131698	D	104	1.1
11139092	D	201	0.9
11139084	FB	11	< 0.3
11139095	D	35	0.7
11138955	FB	Gym	< 0.3
11138959	D	Gym	0.8
11139902	OB	OFFICE BLANK	< 0.3
11139928	TB	TRAVEL BLANK	< 0.3

ATTACHMENT C

Laboratory Analytical Results

March 28, 2022

**** LABORATORY ANALYSIS REPORT ****

Radon test result report for:
FLORA M SINGER ES
MAIN

Kit #	Room Id	Started	Ended	pCi/L	Analyzed
11138902	100D	2022-03-22 @ 9:00 am	2022-03-25 @ 8:00 am	1.1 ± 0.3	2022-03-28
11138937	101A	2022-03-22 @ 9:00 am	2022-03-25 @ 8:00 am	0.7 ± 0.3	2022-03-28
11138901	102	2022-03-22 @ 9:00 am	2022-03-25 @ 8:00 am	< 0.3	2022-03-28
11138903	104	2022-03-22 @ 9:00 am	2022-03-25 @ 8:00 am	0.9 ± 0.3	2022-03-28
11139086	11	2022-03-22 @ 9:00 am	2022-03-25 @ 8:00 am	1.7 ± 0.3	2022-03-28
11139084	11	2022-03-22 @ 9:00 am	2022-03-25 @ 8:00 am	< 0.3	2022-03-28
11139088	15	2022-03-22 @ 9:00 am	2022-03-25 @ 8:00 am	2.2 ± 0.3	2022-03-28
11139079	201	2022-03-22 @ 9:00 am	2022-03-25 @ 9:00 am	1.0 ± 0.3	2022-03-28
11139092	201	2022-03-22 @ 9:00 am	2022-03-25 @ 9:00 am	0.9 ± 0.3	2022-03-28
11139099	22	2022-03-22 @ 9:00 am	2022-03-25 @ 9:00 am	3.0 ± 0.3	2022-03-28
11139087	27	2022-03-22 @ 9:00 am	2022-03-25 @ 8:00 am	1.1 ± 0.3	2022-03-28
11139094	28	2022-03-22 @ 9:00 am	2022-03-25 @ 9:00 am	2.2 ± 0.3	2022-03-28
11138930	29	2022-03-22 @ 9:00 am	2022-03-25 @ 8:00 am	1.3 ± 0.3	2022-03-28
11139095	35	2022-03-22 @ 9:00 am	2022-03-25 @ 8:00 am	0.7 ± 0.3	2022-03-28
11139100	39	2022-03-22 @ 9:00 am	2022-03-25 @ 8:00 am	2.8 ± 0.3	2022-03-28
11139096	43	2022-03-22 @ 9:00 am	2022-03-25 @ 9:00 am	1.6 ± 0.3	2022-03-28
11139093	45	2022-03-22 @ 9:00 am	2022-03-25 @ 9:00 am	1.7 ± 0.3	2022-03-28
11139085	7	2022-03-22 @ 9:00 am	2022-03-25 @ 8:00 am	0.8 ± 0.3	2022-03-28
11139070	GYM	2022-03-22 @ 10:00 am	2022-03-25 @ 9:00 am	< 0.3	2022-03-28

March 28, 2022

**** LABORATORY ANALYSIS REPORT ****

Radon test result report for:
FLORA M. SINGER MS
MAIN

Kit #	Room Id	Started	Ended	pCi/L	Analyzed
11138959	GYM	2022-03-22 @ 8:00 am	2022-03-25 @ 11:00 am	0.8 ± 0.3	2022-03-28
11138955	GYM	2022-03-22 @ 8:00 am	2022-03-25 @ 11:00 am	< 0.3	2022-03-28

Air Chek 1936 Butler Bridge Rd, Mills River, NC 28759-3892 Phone: (828) 684-0893 Fax: (828) 684-8498

March 28, 2022

**** LABORATORY ANALYSIS REPORT ****

Radon test result report for:
FLORA M SINGER ES
MAIN

Kit #	Room Id	Started	Ended	pCi/L	Analyzed
11131679	100	2022-03-22 @ 8:00 am	2022-03-25 @ 8:00 am	0.7 ± 0.3	2022-03-28
11131677	100B	2022-03-22 @ 8:00 am	2022-03-25 @ 8:00 am	0.7 ± 0.3	2022-03-28
11131687	100C	2022-03-22 @ 8:00 am	2022-03-25 @ 8:00 am	0.6 ± 0.3	2022-03-28
11131688	100J	2022-03-22 @ 8:00 am	2022-03-25 @ 9:00 am	0.8 ± 0.3	2022-03-28
11131700	101B	2022-03-22 @ 9:00 am	2022-03-25 @ 8:00 am	0.9 ± 0.3	2022-03-28
11131673	102A	2022-03-22 @ 9:00 am	2022-03-25 @ 8:00 am	1.1 ± 0.3	2022-03-28
11131698	104	2022-03-22 @ 9:00 am	2022-03-25 @ 8:00 am	1.1 ± 0.3	2022-03-28
11131678	106	2022-03-22 @ 9:00 am	2022-03-25 @ 8:00 am	0.9 ± 0.3	2022-03-28
11131685	108	2022-03-22 @ 9:00 am	2022-03-25 @ 8:00 am	0.8 ± 0.3	2022-03-28
11131671	108A	2022-03-22 @ 9:00 am	2022-03-25 @ 8:00 am	< 0.3	2022-03-28
11131697	109	2022-03-22 @ 9:00 am	2022-03-25 @ 8:00 am	< 0.3	2022-03-28
11131664	19	2022-03-22 @ 9:00 am	2022-03-25 @ 8:00 am	0.9 ± 0.3	2022-03-28
11131699	21	2022-03-22 @ 9:00 am	2022-03-25 @ 8:00 am	1.3 ± 0.3	2022-03-28
11131686	220	2022-03-22 @ 9:00 am	2022-03-25 @ 9:00 am	1.7 ± 0.3	2022-03-28
11131680	222	2022-03-22 @ 9:00 am	2022-03-25 @ 9:00 am	1.2 ± 0.3	2022-03-28
11131696	23	2022-03-22 @ 9:00 am	2022-03-25 @ 8:00 am	1.8 ± 0.3	2022-03-28
11131666	24	2022-03-22 @ 9:00 am	2022-03-25 @ 9:00 am	1.9 ± 0.3	2022-03-28
11131672	35	2022-03-22 @ 9:00 am	2022-03-25 @ 8:00 am	1.1 ± 0.3	2022-03-28
11131670	49	2022-03-22 @ 9:00 am	2022-03-25 @ 9:00 am	2.1 ± 0.3	2022-03-28
11131695	GYM	2022-03-22 @ 10:00 am	2022-03-25 @ 9:00 am	1.0 ± 0.3	2022-03-28
11131665	GYM OFFICE	2022-03-22 @ 9:00 am	2022-03-25 @ 9:00 am	2.4 ± 0.3	2022-03-28

EXPOSURE IN BOWSER-MORNER RADON CHAMBER

CLIENT KCI Technologies, Inc. Job Number 204620

NOMINAL Conditions: Radon Conc 27.0 pCi/L Rel. Hum 50.1 % Temp. 70.0 F

Date Start: 3/18/22 Date Stop: 3/21/22 Date Start: _____ Date Stop: _____

Time Start: 0705 Time Stop: 0705 Time Start: _____ Time Stop: _____

Device No.'s: (5) Char Bags - Device No.'s: _____

11139367, 11139368, 11139371, _____

11139710, 11139717 _____

E3 Right

Date Start: _____ Date Stop: _____ Date Start: _____ Date Stop: _____

Time Start: _____ Time Stop: _____ Time Start: _____ Time Stop: _____

Device No.'s: _____ Device No.'s: _____

Date Start: _____ Date Stop: _____ Date Start: _____ Date Stop: _____

Time Start: _____ Time Stop: _____ Time Start: _____ Time Stop: _____

Device No.'s: _____ Device No.'s: _____

Note: All times are in 24-hour (military) notation, Eastern Standard Time (EST)
Background = 7 μ R/h Elevation = 820 ft

March 30, 2022

**** LABORATORY ANALYSIS REPORT ****

Radon test result report for:

MCPS - Spike Sample Lab Results. Measured values are satisfactory, i.e., within $\pm 25\%$ of the chamber's reference value (25.7 pCi/L).

Kit #	Room Id	Started	Ended	pCi/L	Analyzed
11139367	SK1	2022-03-18 @ 7:00 am	2022-03-21 @ 7:00 am	25.9 \pm 2.1	2022-03-30
11139368	SK2	2022-03-18 @ 7:00 am	2022-03-21 @ 7:00 am	23.9 \pm 2.0	2022-03-30
11139371	SK3	2022-03-18 @ 7:00 am	2022-03-21 @ 7:00 am	25.7 \pm 2.1	2022-03-30
11139710	SK4	2022-03-18 @ 7:00 am	2022-03-21 @ 7:00 am	26.4 \pm 2.1	2022-03-30
11139717	SK5	2022-03-18 @ 7:00 am	2022-03-21 @ 7:00 am	24.6 \pm 2.0	2022-03-30

Air Chek 1936 Butler Bridge Rd, Mills River, NC 28759-3892 Phone: (828) 684-0893 Fax: (828) 684-8498



Radon Test Kit Chain of Custody

Project Name: MCPS Radon – March 2022 Schools

Name of Schools:

1. Singer, Flora M. ES

	Date	Initials
Radon Test Kits Deployed	03/22/2022	BMM
Radon Test Kits Collected	03/25/2022	BMM
Radon Test Kits Shipped to Lab*	03/25/2022	BMM
Radon Test Kits Received by Lab*	03/28/2022	BMM

*All samples sent to Air Check, Inc., 1936 Butler Bridge Rd, Mills River, NC 28759