



MCPS RADON TESTING – EXECUTIVE SUMMARY

Site Name	Robert Frost Middle School
Date of Test Report	2/21/2022
Round of Testing	Initial Follow-up Post Remediation 2 Year Testing 5 Year Testing HVAC Upgrade Window Replacement New Addition New Facility
# Rooms Tested	67
# Rooms \geq 4.0 pCi/L	0
Lowest Value	<0.3 pCi/L
Highest Value	0.8 pCi/L

Project Status:

Initial testing completed; Missing or Compromised tests to be re-sampled



February 21, 2022

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

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

Location: Robert Frost Middle School
9201 Scott Dr.
Rockville, MD 20850

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 Robert Frost Middle School, located at 9201 Scott Dr. Rockville, MD 20850 (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 January 19, 2022 and deployed seventy seven (77) 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 January 22, 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 50s and high temperatures ranged from the mid 40s to the low 60s Fahrenheit. Maximum sustained winds ranged from 7-15 miles per hour. Average humidity was around 50% with .15 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		
Robert Frost MS		
Test Period: 01/25/2022-01/28/2022		
Kit Number	Room / Area	Result
11106232	101	< 0.3
11105950	102	< 0.3
11105916	103	< 0.3
11105941	104	0.8
11105908	105	0.5
11105933	106	0.7
11105905	107	0.7
11106237	108	< 0.3
11106238	109	< 0.3
11106230	110	< 0.3
11105914	111	0.8
11105921	112	< 0.3
11105929	113	0.7
11105906	114	< 0.3
11105919	115	< 0.3
11106222	150	< 0.3
11106219	151	< 0.3
11106221	152	< 0.3
11106227	153	< 0.3
11106220	154	< 0.3
11106228	155	< 0.3
11106226	156	< 0.3
11105943	201	< 0.3
11105928	230	< 0.3
11105927	231	< 0.3
11105956	257	< 0.3
11105934	258	< 0.3
11105935	258	< 0.3
11105911	259	< 0.3
11105937	100 PROJECT PREP #1	< 0.3
11105938	100A	< 0.3
11105949	103A	< 0.3
11105962	106A	< 0.3
11106233	109C	0.5
11105936	109D	< 0.3
11105913	110A	< 0.3
11106224	110C	< 0.3
11106231	110C	< 0.3
11106229	114A	0.8
11106225	155B	< 0.3
11105969	200A	< 0.3
11105970	200B WORKROOM	< 0.3

Table 1- Radon Testing Results		
Robert Frost MS		
Test Period: 01/25/2022-01/28/2022		
Kit Number	Room / Area	Result
11105957	200C	< 0.3
11105966	200D PRINCIPAL	< 0.3
11105944	201A	< 0.3
11105953	201B	< 0.3
11105954	201C	< 0.3
11105924	201D	< 0.3
11105931	201E	< 0.3
11105980	201F	< 0.3
11105965	201G	< 0.3
11105926	232 CHORAL	< 0.3
11105925	233 BAND	< 0.3
11105917	241 AUX GYM #1	< 0.3
11105918	241 AUX GYM #1	< 0.3
11105942	249A	< 0.3
11105910	260 AUX GYM #2	0.7
11106242	ASSISTANT PRINCIPAL	< 0.3
11105955	BOYS PE OFFICE	< 0.3
11105907	CAFETERIA	< 0.3
11106245	CAFETERIA	< 0.3
11105958	CONFERENCE ROOM	< 0.3
11105902	COUNSELOR/ COPY	< 0.3
11105915	FINISHING ROOM B	0.6
11105920	GIRLS PE OFFICE	0.6
11105909	GYM	< 0.3
11105912	GYM	< 0.3
11105947	HEALTH EXAMINATION	< 0.3
11105932	HEALTH OFFICE	< 0.3
11105946	HEALTH OFFICE	< 0.3
11105948	HEALTH REST AREA	< 0.3
11105923	HEALTH SUITE	< 0.3
11105930	KILN ROOM	< 0.3
11105940	KITCHEN OFFICE	0.6
11106253	MAIN OFFICE	< 0.3
11105939	STAFF LOUNGE	< 0.3
11105922	WORK ROOM	0.8

Table 2- Radon Testing Results			
Robert Frost MS			
Test Period: 12/13/2021-12/16/2021			
Kit Number	QC Type	Room / Area	Result
11105980	D	201F	< 0.3
11105946	D	Health Office	< 0.3
11105932	FB	Health Office	< 0.3
11105920	D	Girls PE Office	0.6
11105934	D	258	< 0.3
11105935	FB	258	< 0.3
11105908	D	105	0.5
11106231	D	110C	< 0.3
11106224	FB	110C	< 0.3
11106229	D	114A	0.8
11106126	OB	OFFICE BLANK	< 0.3
11105790	TB	TRAVEL Blank	< 0.3

ATTACHMENT C

Laboratory Analytical Results

Radon test result report for:

Kit #	Room Id	Started	Ended	pCi/L	Analyzed
11105937	100 PROJECT PREP #1	2022-01-25 @ 12:00 pm	2022-01-28 @ 10:00 am	< 0.3	2022-01-31
11105938	100A	2022-01-25 @ 1:00 pm	2022-01-28 @ 10:00 am	< 0.3	2022-01-31
11106232	101	2022-01-25 @ 1:00 pm	2022-01-28 @ 10:00 am	< 0.3	2022-01-31
11105950	102	2022-01-25 @ 12:00 pm	2022-01-28 @ 10:00 am	< 0.3	2022-01-31
11105916	103	2022-01-25 @ 12:00 pm	2022-01-28 @ 10:00 am	< 0.3	2022-01-31
11105949	103A	2022-01-25 @ 12:00 pm	2022-01-28 @ 10:00 am	< 0.3	2022-01-31
11105941	104	2022-01-25 @ 12:00 pm	2022-01-28 @ 10:00 am	0.8 ± 0.3	2022-01-31
11105908	105	2022-01-25 @ 1:00 pm	2022-01-28 @ 10:00 am	0.5 ± 0.3	2022-01-31
11105933	106	2022-01-25 @ 1:00 pm	2022-01-28 @ 10:00 am	0.7 ± 0.3	2022-01-31
11105962	106A	2022-01-25 @ 1:00 pm	2022-01-28 @ 10:00 am	< 0.3	2022-01-31
11105905	107	2022-01-25 @ 1:00 pm	2022-01-28 @ 10:00 am	0.7 ± 0.3	2022-01-31
11106237	108	2022-01-25 @ 1:00 pm	2022-01-28 @ 10:00 am	< 0.3	2022-01-31
11106238	109	2022-01-25 @ 1:00 pm	2022-01-28 @ 10:00 am	< 0.3	2022-01-31
11106233	109C	2022-01-25 @ 1:00 pm	2022-01-28 @ 10:00 am	0.5 ± 0.3	2022-01-31
11105936	109D	2022-01-25 @ 1:00 pm	2022-01-28 @ 10:00 am	< 0.3	2022-01-31
11106230	110	2022-01-25 @ 1:00 pm	2022-01-28 @ 10:00 am	< 0.3	2022-01-31
11105913	110A	2022-01-25 @ 1:00 pm	2022-01-28 @ 10:00 am	< 0.3	2022-01-31
11106231	110C	2022-01-25 @ 1:00 pm	2022-01-28 @ 10:00 am	< 0.3	2022-01-31
11106224	110C	2022-01-25 @ 1:00 pm	2022-01-28 @ 10:00 am	< 0.3	2022-01-31
11105914	111	2022-01-25 @ 1:00 pm	2022-01-28 @ 10:00 am	0.8 ± 0.3	2022-01-31
11105921	112	2022-01-25 @ 1:00 pm	2022-01-28 @ 10:00 am	< 0.3	2022-01-31
11105929	113	2022-01-25 @ 1:00 pm	2022-01-28 @ 10:00 am	0.7 ± 0.3	2022-01-31
11105906	114	2022-01-25 @ 1:00 pm	2022-01-28 @ 10:00 am	< 0.3	2022-01-31
11106229	114A	2022-01-25 @ 1:00 pm	2022-01-28 @ 10:00 am	0.8 ± 0.3	2022-01-31
11105919	115	2022-01-25 @ 12:00 pm	2022-01-28 @ 10:00 am	< 0.3	2022-01-31
11106222	150	2022-01-25 @ 1:00 pm	2022-01-28 @ 10:00 am	< 0.3	2022-01-31
11106219	151	2022-01-25 @ 1:00 pm	2022-01-28 @ 10:00 am	< 0.3	2022-01-31
11106221	152	2022-01-25 @ 1:00 pm	2022-01-28 @ 10:00 am	< 0.3	2022-01-31
11106227	153	2022-01-25 @ 1:00 pm	2022-01-28 @ 10:00 am	< 0.3	2022-01-31
11106220	154	2022-01-25 @ 1:00 pm	2022-01-28 @ 10:00 am	< 0.3	2022-01-31
11106228	155	2022-01-25 @ 1:00 pm	2022-01-28 @ 10:00 am	< 0.3	2022-01-31
11106225	155B	2022-01-25 @ 1:00 pm	2022-01-28 @ 10:00 am	< 0.3	2022-01-31
11106226	156	2022-01-25 @ 2:00 pm	2022-01-28 @ 10:00 am	< 0.3	2022-01-31
11105969	200A	2022-01-25 @ 11:00 am	2022-01-28 @ 9:00 am	< 0.3	2022-01-31
11105970	200B WORKROOM	2022-01-25 @ 11:00 am	2022-01-28 @ 9:00 am	< 0.3	2022-01-31
11105957	200C	2022-01-25 @ 11:00 am	2022-01-28 @ 9:00 am	< 0.3	2022-01-31
11105966	200D PRINCIPAL	2022-01-25 @ 11:00 am	2022-01-28 @ 9:00 am	< 0.3	2022-01-31

Radon test result report for:

Kit #	Room Id	Started	Ended	pCi/L	Analyzed
11105943	201	2022-01-25 @ 11:00 am	2022-01-28 @ 9:00 am	< 0.3	2022-01-31
11105944	201A	2022-01-25 @ 11:00 am	2022-01-28 @ 9:00 am	< 0.3	2022-01-31
11105953	201B	2022-01-25 @ 11:00 am	2022-01-28 @ 9:00 am	< 0.3	2022-01-31
11105954	201C	2022-01-25 @ 11:00 am	2022-01-28 @ 9:00 am	< 0.3	2022-01-31
11105924	201D	2022-01-25 @ 11:00 am	2022-01-28 @ 9:00 am	< 0.3	2022-01-31
11105931	201E	2022-01-25 @ 11:00 am	2022-01-28 @ 9:00 am	< 0.3	2022-01-31
11105980	201F	2022-01-25 @ 11:00 am	2022-01-28 @ 9:00 am	< 0.3	2022-01-31
11105965	201G	2022-01-25 @ 11:00 am	2022-01-28 @ 9:00 am	< 0.3	2022-01-31
11105928	230	2022-01-25 @ 12:00 pm	2022-01-28 @ 9:00 am	< 0.3	2022-01-31
11105927	231	2022-01-25 @ 12:00 pm	2022-01-28 @ 10:00 am	< 0.3	2022-01-31
11105926	232 CHORAL	2022-01-25 @ 12:00 pm	2022-01-28 @ 9:00 am	< 0.3	2022-01-31
11105925	233 BAND	2022-01-25 @ 12:00 pm	2022-01-28 @ 9:00 am	< 0.3	2022-01-31
11105917	241 AUX GYM #1	2022-01-25 @ 12:00 pm	2022-01-28 @ 9:00 am	< 0.3	2022-01-31
11105918	241 AUX GYM #1	2022-01-25 @ 12:00 pm	2022-01-28 @ 9:00 am	< 0.3	2022-01-31
11105942	249A	2022-01-25 @ 11:00 am	2022-01-28 @ 9:00 am	< 0.3	2022-01-31
11105956	257	2022-01-25 @ 12:00 pm	2022-01-28 @ 10:00 am	< 0.3	2022-01-31
11105935	258	2022-01-25 @ 12:00 pm	2022-01-28 @ 10:00 am	< 0.3	2022-01-31
11105934	258	2022-01-25 @ 12:00 pm	2022-01-28 @ 10:00 am	< 0.3	2022-01-31
11105911	259	2022-01-25 @ 12:00 pm	2022-01-28 @ 10:00 am	< 0.3	2022-01-31
11105910	260 AUX GYM #2	2022-01-25 @ 12:00 pm	2022-01-28 @ 10:00 am	0.7 ± 0.3	2022-01-31
11106242	ASSISTANT PRINCIPAL	2022-01-25 @ 11:00 am	2022-01-28 @ 9:00 am	< 0.3	2022-01-31
11105955	BOYS PE OFFICE	2022-01-25 @ 12:00 pm	2022-01-28 @ 9:00 am	< 0.3	2022-01-31
11105907	CAFETERIA	2022-01-25 @ 12:00 pm	2022-01-28 @ 9:00 am	< 0.3	2022-01-31
11106245	CAFETERIA	2022-01-25 @ 12:00 pm	2022-01-28 @ 9:00 am	< 0.3	2022-01-31
11105958	CONFERENCE ROOM	2022-01-25 @ 11:00 am	2022-01-28 @ 11:00 am	< 0.3	2022-01-31
11105902	COUNSELOR/ COPY	2022-01-25 @ 11:00 am	2022-01-28 @ 9:00 am	< 0.3	2022-01-31
11105915	FINISHING ROOM B	2022-01-25 @ 1:00 pm	2022-01-28 @ 10:00 am	0.6 ± 0.3	2022-01-31
11105920	GIRLS PE OFFICE	2022-01-25 @ 12:00 pm	2022-01-28 @ 9:00 am	0.6 ± 0.3	2022-01-31
11105909	GYM	2022-01-25 @ 12:00 pm	2022-01-28 @ 9:00 am	< 0.3	2022-01-31
11105912	GYM	2022-01-25 @ 12:00 pm	2022-01-28 @ 9:00 am	< 0.3	2022-01-31
11105947	HEALTH EXAMINATION	2022-01-25 @ 11:00 am	2022-01-28 @ 9:00 am	< 0.3	2022-01-31
11105932	HEALTH OFFICE	2022-01-25 @ 11:00 am	2022-01-28 @ 9:00 am	< 0.3	2022-01-31
11105946	HEALTH OFFICE	2022-01-25 @ 11:00 am	2022-01-28 @ 9:00 am	< 0.3	2022-01-31
11105948	HEALTH REST AREA	2022-01-25 @ 11:00 am	2022-01-28 @ 9:00 am	< 0.3	2022-01-31
11105923	HEALTH SUITE	2022-01-25 @ 11:00 am	2022-01-28 @ 9:00 am	< 0.3	2022-01-31
11105930	KILN ROOM	2022-01-25 @ 1:00 pm	2022-01-28 @ 10:00 am	< 0.3	2022-01-31
11105940	KITCHEN OFFICE	2022-01-25 @ 11:00 am	2022-01-28 @ 9:00 am	0.6 ± 0.3	2022-01-31

February 1, 2022

**** LABORATORY ANALYSIS REPORT ****

Radon test result report for:

Kit #	Room Id	Started	Ended	pCi/L	Analyzed
11106253	MAIN OFFICE	2022-01-25 @ 11:00 am	2022-01-28 @ 9:00 am	< 0.3	2022-01-31
11105939	STAFF LOUNGE	2022-01-25 @ 11:00 am	2022-01-28 @ 9:00 am	< 0.3	2022-01-31
11105922	WORK ROOM	2022-01-25 @ 1:00 pm	2022-01-28 @ 10:00 am	0.8 ± 0.3	2022-01-31

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

EXPOSURE IN BOWSER-MORNER RADON CHAMBER

CLIENT KCI Technologies, Inc. Job Number 203404

NOMINAL Conditions: Radon Conc 16.2 pCi/L Rel. Hum 28.8 % Temp. 59.9 F

Date Start: 12/24/21 Date Stop: 12/27/21 Date Start: _____ Date Stop: _____

Time Start: 0809 Time Stop: 0809 Time Start: _____ Time Stop: _____

Device No.'s: (2) Char Bags - Device No.'s: _____

9341721, 9341722

G4 left

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**

December 31, 2021

**** LABORATORY ANALYSIS REPORT ****

Radon test result report for:

SK
MA MCPS - Spike Sample Lab Results. Measured values are satisfactory, i.e., within $\pm 25\%$ of the chamber's reference value (16.2 pCi/L).

Kit #	Room Id	Started	Ended	pCi/L	Analyzed
9341721	1	2021-12-24 @ 8:00 am	2021-12-27 @ 8:00 am	11.6 \pm 0.9	2021-12-31
9341722	1	2021-12-24 @ 8:00 am	2021-12-27 @ 8:00 am	15.4 \pm 1.2	2021-12-31

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 – January 2022 Schools

Name of Schools:

1. Carver Educational Center
2. College Gardens ES
3. Farmland ES
4. Julius West MS
5. Maryvale ES
6. Robert Frost MS
7. Rock Creek Forest ES
8. Sandburg Learning Center
9. Westbrook ES

	Date	Initials
Radon Test Kits Deployed	01/19/2022	DM
Radon Test Kits Collected	01/22/2022	DM
Radon Test Kits Shipped to Lab*	01/22/2022	DM
Radon Test Kits Received by Lab*	01/24/2022	DM

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



MCPS RADON TESTING – EXECUTIVE SUMMARY

Site Name	Robert Frost Middle School
Date of Test Report	05/12/2022
Round of Testing	Initial Follow-up Post Remediation 2 Year Testing 5 Year Testing HVAC Upgrade Window Replacement New Addition New Facility
# Rooms Tested	1
# Rooms \geq 4.0 pCi/L	0
Lowest Value	<0.3 pCi/L
Highest Value	0.5 pCi/L

Project Status

Current Project Status at this time: Testing completed; no further action needed



May 12, 2022

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

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

Location: Robert Frost Middle School
9201 Scott Dr.
Rockville, MD 20850

Dear Mr. Croyle:

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Scope of Services:

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KCI visited the site on March 21, 2022 and deployed three (3) 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.

KCI sampled the following locations during this follow-up test:

1. Rooms with missing test kits from the Radon 2022 testing period (i.e. test kit was deployed but not recovered),
2. Rooms with invalidated test kits from the Radon 2022 testing period (e.g. an open window in the room or disturbed test kit),
3. Rooms which were locked/inaccessible during the Radon 2022 testing period,
4. Rooms with elevated radon results (i.e. ≥ 3.5 pCi/L),
5. Rooms previously tested for radon but not tested in Radon 2022, and
6. Additional rooms that require testing (if applicable.)

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 24, 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 initial testing.

These tests were conducted to:

- Evaluate radon concentrations at the facility.

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 40°Fs and high temperatures ranged from the low 50°Fs to the low 70°Fs. Maximum sustained winds ranged from 0-29 miles per hour. Average humidity was around 56% with 0.51 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		
Robert Frost MS RT		
Test Period: 03/21/2022 - 03/24/2022		
Kit Number	Room / Area	Result
11139237	249C	< 0.3
11139244	249C	< 0.3
11139268	249C	0.5

Table 2- Radon Testing Results			
Robert Frost MS RT			
Test Period: 03/21/2022 - 03/24/2022			
Kit Number	QC Type	Room / Area	Result
11139237	D	249C	< 0.3
11139244	FB	249C	< 0.3
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:

Kit #	Room Id	Started	Ended	pCi/L	Analyzed
11139237	249C	2022-03-21 @ 12:00 pm	2022-03-24 @ 12:00 pm	< 0.3	2022-03-28
11139244	249C	2022-03-21 @ 12:00 pm	2022-03-24 @ 12:00 pm	< 0.3	2022-03-28
11139268	249C	2022-03-21 @ 12:00 pm	2022-03-24 @ 12:00 pm	0.5 ± 0.3	2022-03-28

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

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 light

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 – Retesting

Name of Schools:

1. Rosa Parks MS
2. Poolesville ES
3. Wyngate ES
4. Seven Locks ES
5. Walt Whitman HS
6. Somerset ES
7. Rock Creek Forest ES
8. Walter Johnson HS
9. Westbrook ES
10. Westland MS
11. Farmland ES
12. College Gardens ES
13. Julius West MS
14. Robert Frost MS
15. Carl Sandburg Learning Center

	Date	Initials
Radon Test Kits Deployed	03/21/2022	BMM
Radon Test Kits Collected	03/24/2022	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