



MCPS RADON TESTING – EXECUTIVE SUMMARY

Site Name	Germantown Elementary School
Date of Test Report	4/6/2022
Round of Testing	Initial Follow-up Post Remediation 2 Year Testing 5 Year Testing HVAC Upgrade Window Replacement New Addition New Facility
# Rooms Tested	46
# Rooms \geq 4.0 pCi/L	0
Lowest Value	<0.3 pCi/L
Highest Value	1.9 pCi/L

Project Status:
Initial testing completed; no further action needed.



April 6, 2022

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

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

Location: Germantown ES
19110 Liberty Mill Rd.
Germantown, MD 20874

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 Germantown ES, located at 19110 Liberty Mill Rd. Germantown, MD 20874 (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 February 15, 2022 and deployed fifty three (53) 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 February 18, 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 20s and high temperatures ranged from the high 30s to the high 40s Fahrenheit. Maximum sustained winds ranged from 5-18 miles per hour. Average humidity was around 15% with 1.5 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		
Germantown ES		
Test Period: 02/15/2022 - 02/18/2022		
Kit Number	Room / Area	Result
11123133	1	0.7
11123111	2	0.7
11123115	3	< 0.3
11123134	4	< 0.3
11123116	5	1.0
11123112	6	1.3
11123119	6	< 0.3
11123141	6	1.4
11123113	7	< 0.3
11123114	8	0.8
11123157	9	1.9
11123147	10	1.4
11123108	11	< 0.3
11123155	12	0.8
11123158	13	< 0.3
11123121	14	< 0.3
11123123	14	< 0.3
11123103	15	< 0.3
11123135	16	< 0.3
11123165	17	< 0.3
11123136	15 OFFICE	< 0.3
11123122	1T	< 0.3
11123156	9 OFFICE	1.0
11123173	AP	0.6
11123131	APR	< 0.3
11123139	APR	< 0.3
11123117	ART	< 0.3
11123105	BOOK ROOM	0.8
11123118	BSO	< 0.3
11123140	CAFE OFFICE	< 0.3
11123144	CONFERENCE	0.6
11123152	CONFERENCE	0.8
11123127	COU	< 0.3
11123142	ESOL	0.7
11123106	G2	0.8
11123107	G2	0.7
11123164	GOF	0.5
11123110	GYM	< 0.3
11123124	GYM	< 0.3
11123109	GYM OFFICE	1.0
11123172	HR	0.8
11123148	K1	1.1

Table 1- Radon Testing Results		
Germantown ES		
Test Period: 02/15/2022 - 02/18/2022		
Kit Number	Room / Area	Result
11123149	K2	0.8
11123104	MC	0.5
11123128	MC	0.6
11123125	MU	0.7
11123132	MU	< 0.3
11123151	PR	1.0
11123120	R	< 0.3
11123150	SDT	< 0.3
11123143	SPT	0.8
11123126	STAFF LOUNGE	< 0.3
11123163	WR	1.0

Table 2- Radon Testing Results			
Germantown ES			
Test Period: 02/15/2022 - 02/18/2022			
Kit Number	QC Type	Room / Area	Result
11123132	D	MU	< 0.3
11123112	D	6	1.3
11123119	FB	6	< 0.3
11123106	D	G2	0.8
11123121	D	14	< 0.3
11123122	FB	14	< 0.3
11123152	D	Conference	0.8
11131660	OB	OFFICE BLANK	< 0.3
11131661	TB	TRAVEL BLANK	< 0.3

ATTACHMENT C

Laboratory Analytical Results

Radon test result report for:
GERMANTOWN ES**1**

Kit #	Room Id	Started	Ended	pCi/L	Analyzed
11123133	1	2022-02-15 @ 9:00 am	2022-02-18 @ 8:00 am	0.7 ± 0.3	2022-02-22
11123147	10	2022-02-15 @ 9:00 am	2022-02-18 @ 8:00 am	1.4 ± 0.4	2022-02-22
11123108	11	2022-02-15 @ 9:00 am	2022-02-18 @ 8:00 am	< 0.3	2022-02-22
11123155	12	2022-02-15 @ 9:00 am	2022-02-18 @ 8:00 am	0.8 ± 0.3	2022-02-22
11123158	13	2022-02-15 @ 9:00 am	2022-02-18 @ 8:00 am	< 0.3	2022-02-22
11123123	14	2022-02-15 @ 9:00 am	2022-02-18 @ 8:00 am	< 0.3	2022-02-22
11123121	14	2022-02-15 @ 9:00 am	2022-02-18 @ 8:00 am	< 0.3	2022-02-22
11123103	15	2022-02-15 @ 9:00 am	2022-02-18 @ 8:00 am	< 0.3	2022-02-22
11123136	15 OFFICE	2022-02-15 @ 9:00 am	2022-02-18 @ 8:00 am	< 0.3	2022-02-22
11123135	16	2022-02-15 @ 9:00 am	2022-02-18 @ 8:00 am	< 0.3	2022-02-22
11123165	17	2022-02-15 @ 9:00 am	2022-02-18 @ 9:00 am	< 0.3	2022-02-22
11123122	1T	2022-02-15 @ 9:00 am	2022-02-18 @ 8:00 am	< 0.3	2022-02-22
11123111	2	2022-02-15 @ 9:00 am	2022-02-18 @ 8:00 am	0.7 ± 0.3	2022-02-22
11123115	3	2022-02-15 @ 9:00 am	2022-02-18 @ 8:00 am	< 0.3	2022-02-22
11123134	4	2022-02-15 @ 9:00 am	2022-02-18 @ 8:00 am	< 0.3	2022-02-22
11123116	5	2022-02-15 @ 9:00 am	2022-02-18 @ 8:00 am	1.0 ± 0.3	2022-02-22
11123141	6	2022-02-15 @ 9:00 am	2022-02-18 @ 8:00 am	1.4 ± 0.4	2022-02-22
11123119	6	2022-02-15 @ 9:00 am	2022-02-18 @ 8:00 am	< 0.3	2022-02-22
11123112	6	2022-02-15 @ 9:00 am	2022-02-18 @ 8:00 am	1.3 ± 0.3	2022-02-22
11123113	7	2022-02-15 @ 9:00 am	2022-02-18 @ 8:00 am	< 0.3	2022-02-22
11123114	8	2022-02-15 @ 9:00 am	2022-02-18 @ 8:00 am	0.8 ± 0.3	2022-02-22
11123157	9	2022-02-15 @ 9:00 am	2022-02-18 @ 8:00 am	1.9 ± 0.3	2022-02-22
11123156	9 OFFICE	2022-02-15 @ 9:00 am	2022-02-18 @ 8:00 am	1.0 ± 0.3	2022-02-22
11123173	AP	2022-02-15 @ 10:00 am	2022-02-18 @ 9:00 am	0.6 ± 0.3	2022-02-22
11123131	APR	2022-02-15 @ 8:00 am	2022-02-18 @ 8:00 am	< 0.3	2022-02-22
11123139	APR	2022-02-15 @ 8:00 am	2022-02-18 @ 8:00 am	< 0.3	2022-02-22
11123117	ART	2022-02-15 @ 8:00 am	2022-02-18 @ 8:00 am	< 0.3	2022-02-22
11123105	BOOK ROOM	2022-02-15 @ 9:00 am	2022-02-18 @ 8:00 am	0.8 ± 0.3	2022-02-22
11123118	BSO	2022-02-15 @ 8:00 am	2022-02-18 @ 8:00 am	< 0.3	2022-02-22
11123140	CAFE OFFICE	2022-02-15 @ 8:00 am	2022-02-18 @ 8:00 am	< 0.3	2022-02-22
11123152	CONFERENCE	2022-02-15 @ 9:00 am	2022-02-18 @ 9:00 am	0.8 ± 0.4	2022-02-22
11123144	CONFERENCE	2022-02-15 @ 9:00 am	2022-02-18 @ 9:00 am	0.6 ± 0.3	2022-02-22
11123127	COU	2022-02-15 @ 9:00 am	2022-02-18 @ 8:00 am	< 0.3	2022-02-22
11123142	ESOL	2022-02-15 @ 8:00 am	2022-02-18 @ 8:00 am	0.7 ± 0.3	2022-02-22
11123107	G2	2022-02-15 @ 9:00 am	2022-02-18 @ 8:00 am	0.7 ± 0.3	2022-02-22
11123106	G2	2022-02-15 @ 9:00 am	2022-02-18 @ 8:00 am	0.8 ± 0.3	2022-02-22
11123164	GOF	2022-02-15 @ 9:00 am	2022-02-18 @ 9:00 am	0.5 ± 0.3	2022-02-22

Radon test result report for:**GERMANTOWN ES****1**

Kit #	Room Id	Started	Ended	pCi/L	Analyzed
11123124	GYM	2022-02-15 @ 8:00 am	2022-02-18 @ 8:00 am	< 0.3	2022-02-22
11123110	GYM	2022-02-15 @ 8:00 am	2022-02-18 @ 8:00 am	< 0.3	2022-02-22
11123109	GYM OFFICE	2022-02-15 @ 8:00 am	2022-02-18 @ 8:00 am	1.0 ± 0.4	2022-02-22
11123172	HR	2022-02-15 @ 10:00 am	2022-02-18 @ 9:00 am	0.8 ± 0.3	2022-02-22
11123148	K1	2022-02-15 @ 9:00 am	2022-02-18 @ 8:00 am	1.1 ± 0.4	2022-02-22
11123149	K2	2022-02-15 @ 8:00 am	2022-02-18 @ 8:00 am	0.8 ± 0.4	2022-02-22
11123104	MC	2022-02-15 @ 9:00 am	2022-02-18 @ 8:00 am	0.5 ± 0.3	2022-02-22
11123128	MC	2022-02-15 @ 9:00 am	2022-02-18 @ 8:00 am	0.6 ± 0.3	2022-02-22
11123132	MU	2022-02-15 @ 8:00 am	2022-02-18 @ 8:00 am	< 0.3	2022-02-22
11123125	MU	2022-02-15 @ 8:00 am	2022-02-18 @ 8:00 am	0.7 ± 0.3	2022-02-22
11123151	PR	2022-02-15 @ 9:00 am	2022-02-18 @ 9:00 am	1.0 ± 0.3	2022-02-22
11123120	R	2022-02-15 @ 9:00 am	2022-02-18 @ 8:00 am	< 0.3	2022-02-22
11123150	SDT	2022-02-15 @ 9:00 am	2022-02-18 @ 8:00 am	< 0.3	2022-02-22
11123143	SPT	2022-02-15 @ 9:00 am	2022-02-18 @ 9:00 am	0.8 ± 0.3	2022-02-22
11123126	STAFF LOUNGE	2022-02-15 @ 8:00 am	2022-02-18 @ 8:00 am	< 0.3	2022-02-22
11123163	WR	2022-02-15 @ 9:00 am	2022-02-18 @ 9:00 am	1.0 ± 0.4	2022-02-22

EXPOSURE IN BOWSER-MORNER RADON CHAMBER

CLIENT KCI Technologies, Inc. Job Number 204186

NOMINAL Conditions: Radon Conc 25.8 pCi/L Rel. Hum 50.1 % Temp. 70.9 F

Date Start: 2/18/22 Date Stop: 2/21/22 Date Start: _____ Date Stop: _____

Time Start: 0911 Time Stop: 0911 Time Start: _____ Time Stop: _____

Device No.'s: (3) Char Bags -
11113484, 1112998, 20107126 Device No.'s: _____

23 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 µR/h Elevation = 820 ft**

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 Number	Start Date	Start Time	End Date	End Time	Temp.	Facility	Building	Room	Project ID	Floor	Result
11113484	2022-02-18	9:00 am	2022-02-21	9:00 am	71	OFFICE	MAIN	SK1		1	27.9
11122998	2022-02-18	9:00 am	2022-02-21	9:00 am	71	OFFICE	MAIN	SK2		1	26.0
20107126	2022-02-18	9:00 am	2022-02-21	9:00 am	71	OFFICE	MAIN	SK3		1	27.6



Radon Test Kit Chain of Custody

Project Name: MCPS Radon – February 2022 Schools

Name of Schools:

1. Damascus HS
2. Germantown ES
3. Great Seneca Creek ES
4. Lake Seneca ES
5. S. Christa McAuliffe ES
6. Northwest HS
7. Waters Landing ES
8. Seneca Valley HS
9. Cedar Grove ES
10. Capt. James E. Daly ES
11. Neelsville MS
12. Dr. Sally K. Ride ES

	Date	Initials
Radon Test Kits Deployed	02/15/2022	DM
Radon Test Kits Collected	02/18/2022	DM
Radon Test Kits Shipped to Lab*	02/18/2022	DM
Radon Test Kits Received by Lab*	02/21/2022	DM

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