



MCPS RADON TESTING – EXECUTIVE SUMMARY

Site Name	Laytonsville Elementary School
Date of Test Report	4/26/2022
Round of Testing	Initial Follow-up Post Remediation 2 Year Testing 5 Year Testing HVAC Upgrade Window Replacement New Addition New Facility
# Rooms Tested	62
# Rooms \geq 4.0 pCi/L	0
Lowest Value	<0.3 pCi/L
Highest Value	2.7 pCi/L

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



April 26, 2022

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

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

Location: Laytonsville Elementary School
21401 Laytonsville Road
Gaithersburg, MD 20882

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 Laytonsville ES, located at 21401 Laytonsville Rd. Gaithersburg, MD 20882 (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 28, 2022 and deployed seventy two (72) 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 3, 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 biennial post-mitigation 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 50s to the low 60s Fahrenheit. Maximum sustained winds ranged from 9-17 miles per hour. Average humidity was around 40% with 0 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		
Laytonsville ES		
Test Period: 02/28/2022 - 03/03/2022		
Kit Number	Room / Area	Result
11132770	1	< 0.3
11132768	2	< 0.3
11132769	3	< 0.3
11132776	4	< 0.3
11132765	5	1.0
11132759	6	< 0.3
11132760	7	< 0.3
11132764	8	< 0.3
11132763	9	< 0.3
11132755	10	0.5
11132742	11	< 0.3
11132758	12	< 0.3
11132762	13	< 0.3
11132746	14	< 0.3
11132766	14	< 0.3
11132752	15	< 0.3
11132750	16	< 0.3
11132775	17	< 0.3
11132751	18	< 0.3
11132757	18	< 0.3
11132747	19	< 0.3
11132748	19	< 0.3
11132741	20	< 0.3
11132761	3A	< 0.3
11132713	ART	< 0.3
11132731	ASST PRINCIPAL	< 0.3
11132754	BOOK CLOSET 3	1.1
11132717	BUILDING SERVICES	0.9
11132720	BUILDING SERVICES	1.2
11132727	CAFETERIA	0.7
11132744	CAFETERIA	< 0.3
11132767	COMPUTER LAB	< 0.3
11132733	CONFERENCE	< 0.3
11132749	CONFERENCE	< 0.3
11132728	COPY ROOM	< 0.3
11132729	COPY ROOM	< 0.3
11132738	COUNSELOR WARD	0.9
11132722	ESOL	< 0.3
11132712	FILE ROOM	< 0.3
11132707	GYM	1.4
11132708	GYM	1.4
11132714	GYM OFFICE	1.2

Table 1- Radon Testing Results		
Laytonsville ES		
Test Period: 02/28/2022 - 03/03/2022		
Kit Number	Room / Area	Result
11132734	HEALTH	< 0.3
11132740	HEALTH OFFICE	< 0.3
11132718	INSTRUMENTAL MUSIC	1.6
11132710	K1	< 0.3
11132711	K2	0.5
11132723	K3	< 0.3
11132724	K4	< 0.3
11132725	K4	< 0.3
11132721	KITCHEN OFFICE	< 0.3
11132716	LOUNGE	< 0.3
11132732	MAIL ROOM	< 0.3
11132739	MAIN OFFICE	< 0.3
11132709	MEDIA CENTER	< 0.3
11132715	MEDIA CENTER	< 0.3
11132705	MEDIA OFFICE	< 0.3
11132706	MEDIA WORKROOM	< 0.3
11132773	MINDFULNESS	< 0.3
11132730	MUSIC SILVA	< 0.3
11132726	PRINCIPAL	< 0.3
11132737	READING RESOURCE	< 0.3
11132745	READING RESOURCE	0.6
11132704	RESOURCE 1	< 0.3
11132756	RESOURCE 2	2.7
11132735	RESOURCE 3	< 0.3
11132703	RESOURCE1	< 0.3
11132736	SPEECH	0.7
11132701	STAFF DEVELOPMENT	< 0.3
11132702	STAFF DEVELOPMENT	< 0.3
11132743	STAGE	< 0.3
11132719	TV STUDIO	1.6

Table 2- Radon Testing Results			
Laytonsville ES			
Test Period: 02/28/2022 - 03/03/2022			
Kit Number	QC Type	Room / Area	Result
11132725	D	K4	< 0.3
11132703	D	Resource 1	< 0.3
11132701	FB	Staff Development	< 0.3
11132720	D	Building Services	1.2
11132745	D	Reading Resource	0.6
11132728	FB	Copy Room	< 0.3
11132766	D	14	< 0.3
11132748	D	19	< 0.3
11132751	FB	18	< 0.3
11132749	D	Conference	< 0.3
11130811	OB	OFFICE BLANK	< 0.3
11130816	TB	TRAVEL BLANK	< 0.3

Summary of Missed Locations		
Laytonsville ES		
Test Period: 02/28/2022 - 03/03/2022		
Kit Number	Room/Area	Result
	NA	

Summary of Missing, Compromised and ≥ 4 piC/L Tests		
Laytonsville ES		
Test Period: 02/28/2022 - 03/03/2022		
Kit Number	Room/Area	Result
	NA	

Table Note:
* Missing or Compromised Sample

ATTACHMENT C

Laboratory Analytical Results

Radon test result report for:

Kit #	Room Id	Started	Ended	pCi/L	Analyzed
11132770	1	2022-02-28 @ 1:00 pm	2022-03-03 @ 9:00 am	< 0.3	2022-03-08
11132755	10	2022-02-28 @ 12:00 pm	2022-03-03 @ 8:00 am	0.5 ± 0.3	2022-03-08
11132742	11	2022-02-28 @ 12:00 pm	2022-03-03 @ 8:00 am	< 0.3	2022-03-08
11132758	12	2022-02-28 @ 12:00 pm	2022-03-03 @ 8:00 am	< 0.3	2022-03-08
11132762	13	2022-02-28 @ 12:00 pm	2022-03-03 @ 8:00 am	< 0.3	2022-03-08
11132746	14	2022-02-28 @ 12:00 pm	2022-03-03 @ 8:00 am	< 0.3	2022-03-08
11132766	14	2022-02-28 @ 12:00 pm	2022-03-03 @ 8:00 am	< 0.3	2022-03-08
11132752	15	2022-02-28 @ 12:00 pm	2022-03-03 @ 8:00 am	< 0.3	2022-03-08
11132750	16	2022-02-28 @ 12:00 pm	2022-03-03 @ 8:00 am	< 0.3	2022-03-08
11132775	17	2022-02-28 @ 1:00 pm	2022-03-03 @ 8:00 am	< 0.3	2022-03-08
11132751	18	2022-02-28 @ 12:00 pm	2022-03-03 @ 8:00 am	< 0.3	2022-03-08
11132757	18	2022-02-28 @ 12:00 pm	2022-03-03 @ 8:00 am	< 0.3	2022-03-08
11132747	19	2022-02-28 @ 12:00 pm	2022-03-03 @ 8:00 am	< 0.3	2022-03-08
11132748	19	2022-02-28 @ 12:00 pm	2022-03-03 @ 8:00 am	< 0.3	2022-03-08
11132768	2	2022-02-28 @ 1:00 pm	2022-03-03 @ 9:00 am	< 0.3	2022-03-08
11132741	20	2022-02-28 @ 12:00 pm	2022-03-03 @ 8:00 am	< 0.3	2022-03-08
11132769	3	2022-02-28 @ 1:00 pm	2022-03-03 @ 9:00 am	< 0.3	2022-03-08
11132761	3A	2022-02-28 @ 12:00 pm	2022-03-03 @ 9:00 am	< 0.3	2022-03-08
11132776	4	2022-02-28 @ 1:00 pm	2022-03-03 @ 9:00 am	< 0.3	2022-03-08
11132765	5	2022-02-28 @ 12:00 pm	2022-03-03 @ 9:00 am	1.0 ± 0.4	2022-03-08
11132759	6	2022-02-28 @ 12:00 pm	2022-03-03 @ 8:00 am	< 0.3	2022-03-08
11132760	7	2022-02-28 @ 12:00 pm	2022-03-03 @ 8:00 am	< 0.3	2022-03-08
11132764	8	2022-02-28 @ 12:00 pm	2022-03-03 @ 8:00 am	< 0.3	2022-03-08
11132763	9	2022-02-28 @ 12:00 pm	2022-03-03 @ 8:00 am	< 0.3	2022-03-08
11132713	ART	2022-02-28 @ 11:00 am	2022-03-03 @ 9:00 am	< 0.3	2022-03-08
11132731	ASST PRINCIPAL	2022-02-28 @ 11:00 am	2022-03-03 @ 8:00 am	< 0.3	2022-03-08
11132754	BOOK CLOSET 3	2022-02-28 @ 12:00 pm	2022-03-03 @ 8:00 am	1.1 ± 0.4	2022-03-08
11132717	BUILDING SERVICES	2022-02-28 @ 11:00 am	2022-03-03 @ 8:00 am	0.9 ± 0.4	2022-03-08
11132720	BUILDING SERVICES	2022-02-28 @ 11:00 am	2022-03-03 @ 8:00 am	1.2 ± 0.4	2022-03-08
11132744	CAFETERIA	2022-02-28 @ 12:00 pm	2022-03-03 @ 8:00 am	< 0.3	2022-03-08
11132727	CAFETERIA	2022-02-28 @ 12:00 pm	2022-03-03 @ 8:00 am	0.7 ± 0.4	2022-03-08
11132767	COMPUTER LAB	2022-02-28 @ 1:00 pm	2022-03-03 @ 9:00 am	< 0.3	2022-03-08
11132733	CONFERENCE	2022-02-28 @ 11:00 am	2022-03-03 @ 8:00 am	< 0.3	2022-03-08
11132749	CONFERENCE	2022-02-28 @ 1:00 pm	2022-03-03 @ 9:00 am	< 0.3	2022-03-08
11132728	COPY ROOM	2022-02-28 @ 12:00 pm	2022-03-03 @ 9:00 am	< 0.3	2022-03-08
11132729	COPY ROOM	2022-02-28 @ 12:00 pm	2022-03-03 @ 9:00 am	< 0.3	2022-03-08
11132738	COUNSELOR WARD	2022-02-28 @ 12:00 pm	2022-03-03 @ 9:00 am	0.9 ± 0.4	2022-03-08

Radon test result report for:

Kit #	Room Id	Started	Ended	pCi/L	Analyzed
11132722	ESOL	2022-02-28 @ 12:00 pm	2022-03-03 @ 8:00 am	< 0.3	2022-03-08
11132712	FILE ROOM	2022-02-28 @ 11:00 am	2022-03-03 @ 8:00 am	< 0.3	2022-03-08
11132708	GYM	2022-02-28 @ 11:00 am	2022-03-03 @ 8:00 am	1.4 ± 0.4	2022-03-08
11132707	GYM	2022-02-28 @ 11:00 am	2022-03-03 @ 8:00 am	1.4 ± 0.4	2022-03-08
11132714	GYM OFFICE	2022-02-28 @ 11:00 am	2022-03-03 @ 8:00 am	1.2 ± 0.4	2022-03-08
11132734	HEALTH	2022-02-28 @ 11:00 am	2022-03-03 @ 8:00 am	< 0.3	2022-03-08
11132740	HEALTH OFFICE	2022-02-28 @ 11:00 am	2022-03-03 @ 8:00 am	< 0.3	2022-03-08
11132718	INSTRUMENTAL MUSIC	2022-02-28 @ 11:00 am	2022-03-03 @ 8:00 am	1.6 ± 0.4	2022-03-08
11132710	K1	2022-02-28 @ 11:00 am	2022-03-03 @ 8:00 am	< 0.3	2022-03-08
11132711	K2	2022-02-28 @ 11:00 am	2022-03-03 @ 8:00 am	0.5 ± 0.4	2022-03-08
11132723	K3	2022-02-28 @ 11:00 am	2022-03-03 @ 8:00 am	< 0.3	2022-03-08
11132724	K4	2022-02-28 @ 11:00 am	2022-03-03 @ 8:00 am	< 0.3	2022-03-08
11132725	K4	2022-02-28 @ 11:00 am	2022-03-03 @ 8:00 am	< 0.3	2022-03-08
11132721	KITCHEN OFFICE	2022-02-28 @ 12:00 pm	2022-03-03 @ 8:00 am	< 0.3	2022-03-08
11132716	LOUNGE	2022-02-28 @ 11:00 am	2022-03-03 @ 9:00 am	< 0.3	2022-03-08
11132732	MAIL ROOM	2022-02-28 @ 11:00 am	2022-03-03 @ 8:00 am	< 0.3	2022-03-08
11132739	MAIN OFFICE	2022-02-28 @ 11:00 am	2022-03-03 @ 8:00 am	< 0.3	2022-03-08
11132715	MEDIA CENTER	2022-02-28 @ 11:00 am	2022-03-03 @ 8:00 am	< 0.3	2022-03-08
11132709	MEDIA CENTER	2022-02-28 @ 11:00 am	2022-03-03 @ 8:00 am	< 0.3	2022-03-08
11132705	MEDIA OFFICE	2022-02-28 @ 11:00 am	2022-03-03 @ 8:00 am	< 0.3	2022-03-08
11132706	MEDIA WORKROOM	2022-02-28 @ 11:00 am	2022-03-03 @ 8:00 am	< 0.3	2022-03-08
11132773	MINDFULNESS	2022-02-28 @ 1:00 pm	2022-03-03 @ 9:00 am	< 0.3	2022-03-08
11132730	MUSIC SILVA	2022-02-28 @ 12:00 pm	2022-03-03 @ 8:00 am	< 0.3	2022-03-08
11132726	PRINCIPAL	2022-02-28 @ 11:00 am	2022-03-03 @ 8:00 am	< 0.3	2022-03-08
11132745	READING RESOURCE	2022-02-28 @ 12:00 pm	2022-03-03 @ 9:00 am	0.6 ± 0.4	2022-03-08
11132737	READING RESOURCE	2022-02-28 @ 12:00 pm	2022-03-03 @ 9:00 am	< 0.3	2022-03-08
11132704	RESOURCE 1	2022-02-28 @ 11:00 am	2022-03-03 @ 9:00 am	< 0.3	2022-03-08
11132756	RESOURCE 2	2022-02-28 @ 12:00 pm	2022-03-03 @ 8:00 am	2.7 ± 0.4	2022-03-08
11132735	RESOURCE 3	2022-02-28 @ 12:00 pm	2022-03-03 @ 9:00 am	< 0.3	2022-03-08
11132703	RESOURCE1	2022-02-28 @ 11:00 am	2022-03-03 @ 9:00 am	< 0.3	2022-03-08
11132736	SPEECH	2022-02-28 @ 12:00 pm	2022-03-03 @ 9:00 am	0.7 ± 0.4	2022-03-08
11132701	STAFF DEVELOPMENT	2022-02-28 @ 11:00 am	2022-03-03 @ 9:00 am	< 0.3	2022-03-08
11132702	STAFF DEVELOPMENT	2022-02-28 @ 11:00 am	2022-03-03 @ 9:00 am	< 0.3	2022-03-08
11132743	STAGE	2022-02-28 @ 12:00 pm	2022-03-03 @ 8:00 am	< 0.3	2022-03-08
11132719	TV STUDIO	2022-02-28 @ 11:00 am	2022-03-03 @ 8:00 am	1.6 ± 0.4	2022-03-08

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

March 30, 2022

**** LABORATORY ANALYSIS REPORT ****

Radon test result report for:

**RSH
MAIN**

Kit #	Room Id	Started	Ended	pCi/L	Analyzed
11139726	BASEMENT	2022-03-20 @ 8:00 am	2022-03-23 @ 7:00 am	0.9 ± 0.5	2022-03-30
11139725	DINING	2022-03-20 @ 8:00 am	2022-03-23 @ 7:00 am	< 0.3	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. Marshall, Thurgood ES
2. Ridgeview MS
3. Travilah ES
4. Flower Hill ES
5. Resnik, Judith A. ES
6. Strawberry Knolls ES
7. Whetstone ES
8. Laytonsville ES
9. Stedwick ES
10. Watkins Mill ES
11. Watkins Mill HS
12. Einstein, Albert E. HS

	Date	Initials
Radon Test Kits Deployed	02/28/2022	PM
Radon Test Kits Collected	03/03/2022	PM
Radon Test Kits Shipped to Lab*	03/3/2022	PM
Radon Test Kits Received by Lab*	03/5/2022	PM

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