



MCPS RADON TESTING – EXECUTIVE SUMMARY

Site Name	Arcola 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	51
# Rooms \geq 4.0 pCi/L	0
Lowest Value	<0.3 pCi/L
Highest Value	3.1 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: Arcola Elementary School
1820 Franwall Ave.
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 Arcola ES, located at 1820 Franwall Ave. 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 1, 2022 and deployed fifty seven (57) 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 4, 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 concentration levels 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 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		
Arcola ES		
Test Period: 03/01/2022 - 03/04/2022		
Kit Number	Room / Area	Result
11131319	2	1.2
11131337	3	< 0.3
11131330	4	3.1
11131329	6	1.4
11131340	7	1.2
11131325	8	1.1
11131341	9	1.1
11131326	10	0.8
11131332	10	0.7
11131338	12	2.1
11131345	13	1.4
11131362	15	1.0
11131363	15	< 0.3
11131339	16	1.0
11131342	18	0.9
11131336	19	1.7
11131344	21	0.9
11131333	22	1.0
11131335	24	1.6
11131347	24	1.4
11131353	27	0.7
11131369	28	1.0
11131354	31	0.8
11131343	40	1.0
11131334	44	0.7
11131348	44	0.7
11131352	48	0.7
11131360	50	< 0.3
11131370	52	0.7
11131331	53	1.4
11131364	54	0.7
11131301	100	0.8
11131322	109	0.8
11131318	112	< 0.3
11131320	112	0.9
11131323	113	0.9
11131324	113	0.6
11131317	150	< 0.3
11131304	153	0.6
11131312	153	< 0.3
11131314	174	2.0
11131307	176	0.7

Table 1- Radon Testing Results		
Arcola ES		
Test Period: 03/01/2022 - 03/04/2022		
Kit Number	Room / Area	Result
11131311	100C	0.6
11131310	100E	1.3
11131303	100F	0.9
11131313	100G	0.7
11131302	100H	< 0.3
11131351	46A	< 0.3
11131361	46B	< 0.3
11131355	46C	< 0.3
11131356	46D	< 0.3
11131305	APR	1.0
11131306	APR	0.6
11131315	GYM	1.0
11131316	GYM	2.4
11131309	HEALTHROOM	0.6
11131308	KITCHEN	0.7
11131321	MEDIA CENTER	< 0.3

Table 2- Radon Testing Results			
Arcola ES			
Test Period: 03/01/2022 - 03/04/2022			
Kit Number	QC Type	Room / Area	Result
11131304	D	153	0.6
11131324	D	113	0.6
11131318	FB	112	< 0.3
11131332	D	10	0.7
11131335	D	24	1.6
11131363	FB	15	< 0.3
11131334	D	44	0.7
11130861	OB	OFFICE BLANK	< 0.3
11130854	TB	TRAVEL BLANK	< 0.3

ATTACHMENT C

Laboratory Analytical Results

March 8, 2022

**** LABORATORY ANALYSIS REPORT ****

Radon test result report for:
ARCOLA ES
MAIN

Kit #	Room Id	Started	Ended	pCi/L	Analyzed
11131334	44	2022-03-01 @ 11:00 am	2022-03-04 @ 12:00 pm	0.7 ± 0.3	2022-03-08

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

Radon test result report for:

**ARCOLA ELEMENTARY SCHOOL
MAIN**

Kit #	Room Id	Started	Ended	pCi/L	Analyzed
11131326	10	2022-03-01 @ 11:00 am	2022-03-04 @ 11:00 am	0.8 ± 0.3	2022-03-08
11131332	10	2022-03-01 @ 11:00 am	2022-03-04 @ 11:00 am	0.7 ± 0.3	2022-03-08
11131301	100	2022-03-01 @ 11:00 am	2022-03-04 @ 10:00 am	0.8 ± 0.3	2022-03-08
11131311	100C	2022-03-01 @ 11:00 am	2022-03-04 @ 10:00 am	0.6 ± 0.3	2022-03-08
11131310	100E	2022-03-01 @ 11:00 am	2022-03-04 @ 10:00 am	1.3 ± 0.3	2022-03-08
11131303	100F	2022-03-01 @ 11:00 am	2022-03-04 @ 10:00 am	0.9 ± 0.3	2022-03-08
11131313	100G	2022-03-01 @ 11:00 am	2022-03-04 @ 10:00 am	0.7 ± 0.3	2022-03-08
11131302	100H	2022-03-01 @ 11:00 am	2022-03-04 @ 10:00 am	< 0.3	2022-03-08
11131322	109	2022-03-01 @ 11:00 am	2022-03-04 @ 10:00 am	0.8 ± 0.3	2022-03-08
11131318	112	2022-03-01 @ 11:00 am	2022-03-04 @ 10:00 am	< 0.3	2022-03-08
11131320	112	2022-03-01 @ 11:00 am	2022-03-04 @ 10:00 am	0.9 ± 0.3	2022-03-08
11131324	113	2022-03-01 @ 11:00 am	2022-03-04 @ 11:00 am	0.6 ± 0.3	2022-03-08
11131323	113	2022-03-01 @ 11:00 am	2022-03-04 @ 11:00 am	0.9 ± 0.3	2022-03-08
11131338	12	2022-03-01 @ 11:00 am	2022-03-04 @ 11:00 am	2.1 ± 0.3	2022-03-08
11131345	13	2022-03-01 @ 11:00 am	2022-03-04 @ 11:00 am	1.4 ± 0.3	2022-03-08
11131362	15	2022-03-01 @ 12:00 pm	2022-03-04 @ 11:00 am	1.0 ± 0.3	2022-03-08
11131363	15	2022-03-01 @ 12:00 pm	2022-03-04 @ 11:00 am	< 0.3	2022-03-08
11131317	150	2022-03-01 @ 11:00 am	2022-03-04 @ 10:00 am	< 0.3	2022-03-08
11131312	153	2022-03-01 @ 11:00 am	2022-03-04 @ 10:00 am	< 0.3	2022-03-08
11131304	153	2022-03-01 @ 11:00 am	2022-03-04 @ 10:00 am	0.6 ± 0.3	2022-03-08
11131339	16	2022-03-01 @ 11:00 am	2022-03-04 @ 11:00 am	1.0 ± 0.3	2022-03-08
11131314	174	2022-03-01 @ 11:00 am	2022-03-04 @ 10:00 am	2.0 ± 0.3	2022-03-08
11131307	176	2022-03-01 @ 11:00 am	2022-03-04 @ 10:00 am	0.7 ± 0.3	2022-03-08
11131342	18	2022-03-01 @ 11:00 am	2022-03-04 @ 11:00 am	0.9 ± 0.3	2022-03-08
11131336	19	2022-03-01 @ 12:00 pm	2022-03-04 @ 11:00 am	1.7 ± 0.3	2022-03-08
11131319	2	2022-03-01 @ 11:00 am	2022-03-04 @ 11:00 am	1.2 ± 0.3	2022-03-07
11131344	21	2022-03-01 @ 12:00 pm	2022-03-04 @ 11:00 am	0.9 ± 0.3	2022-03-08
11131333	22	2022-03-01 @ 11:00 am	2022-03-04 @ 11:00 am	1.0 ± 0.3	2022-03-08
11131335	24	2022-03-01 @ 12:00 pm	2022-03-04 @ 11:00 am	1.6 ± 0.3	2022-03-08
11131347	24	2022-03-01 @ 12:00 pm	2022-03-04 @ 11:00 am	1.4 ± 0.3	2022-03-08
11131353	27	2022-03-01 @ 12:00 pm	2022-03-04 @ 11:00 am	0.7 ± 0.3	2022-03-08
11131369	28	2022-03-01 @ 12:00 pm	2022-03-04 @ 11:00 am	1.0 ± 0.3	2022-03-08
11131337	3	2022-03-01 @ 11:00 am	2022-03-04 @ 11:00 am	< 0.3	2022-03-08
11131354	31	2022-03-01 @ 12:00 pm	2022-03-04 @ 11:00 am	0.8 ± 0.3	2022-03-08
11131330	4	2022-03-01 @ 11:00 am	2022-03-04 @ 11:00 am	3.1 ± 0.4	2022-03-08
11131343	40	2022-03-01 @ 12:00 pm	2022-03-04 @ 11:00 am	1.0 ± 0.3	2022-03-08
11131348	44	2022-03-01 @ 12:00 pm	2022-03-04 @ 11:00 am	0.7 ± 0.3	2022-03-08

March 8, 2022

**** LABORATORY ANALYSIS REPORT ****

Radon test result report for:
**ARCOLA ELEMENTARY SCHOOL
MAIN**

Kit #	Room Id	Started	Ended	pCi/L	Analyzed
11131351	46A	2022-03-01 @ 12:00 pm	2022-03-04 @ 11:00 am	< 0.3	2022-03-07
11131361	46B	2022-03-01 @ 12:00 pm	2022-03-04 @ 11:00 am	< 0.3	2022-03-08
11131355	46C	2022-03-01 @ 12:00 pm	2022-03-04 @ 11:00 am	< 0.3	2022-03-08
11131356	46D	2022-03-01 @ 12:00 pm	2022-03-04 @ 11:00 am	< 0.3	2022-03-08
11131352	48	2022-03-01 @ 12:00 pm	2022-03-04 @ 11:00 am	0.7 ± 0.3	2022-03-08
11131360	50	2022-03-01 @ 12:00 pm	2022-03-04 @ 11:00 am	< 0.3	2022-03-08
11131370	52	2022-03-01 @ 12:00 pm	2022-03-04 @ 11:00 am	0.7 ± 0.3	2022-03-08
11131331	53	2022-03-01 @ 11:00 am	2022-03-04 @ 11:00 am	1.4 ± 0.3	2022-03-07
11131364	54	2022-03-01 @ 12:00 pm	2022-03-04 @ 11:00 am	0.7 ± 0.3	2022-03-08
11131329	6	2022-03-01 @ 11:00 am	2022-03-04 @ 11:00 am	1.4 ± 0.3	2022-03-08
11131340	7	2022-03-01 @ 11:00 am	2022-03-04 @ 11:00 am	1.2 ± 0.3	2022-03-08
11131325	8	2022-03-01 @ 11:00 am	2022-03-04 @ 11:00 am	1.1 ± 0.3	2022-03-08
11131341	9	2022-03-01 @ 11:00 am	2022-03-04 @ 11:00 am	1.1 ± 0.3	2022-03-08
11131305	APR	2022-03-01 @ 11:00 am	2022-03-04 @ 10:00 am	1.0 ± 0.3	2022-03-08
11131306	APR	2022-03-01 @ 11:00 am	2022-03-04 @ 10:00 am	0.6 ± 0.3	2022-03-08
11131316	GYM	2022-03-01 @ 11:00 am	2022-03-04 @ 10:00 am	2.4 ± 0.3	2022-03-08
11131315	GYM	2022-03-01 @ 11:00 am	2022-03-04 @ 10:00 am	1.0 ± 0.3	2022-03-08
11131309	HEALTHROOM	2022-03-01 @ 11:00 am	2022-03-04 @ 10:00 am	0.6 ± 0.3	2022-03-08
11131308	KITCHEN	2022-03-01 @ 11:00 am	2022-03-04 @ 10:00 am	0.7 ± 0.3	2022-03-08
11131321	MEDIA CENTER	2022-03-01 @ 11:00 am	2022-03-04 @ 10:00 am	< 0.3	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



Radon Test Kit Chain of Custody

Project Name: MCPS Radon – March 2022 Schools

Name of Schools:

1. Newport Mill MS
2. Rock View ES
3. Eastern MS
4. Blair, Montgomery HS
5. Montgomery Knolls ES
6. Northwood HS
7. Oakview ES
8. Pine Crest ES
9. Arcola ES
10. Glenallen ES

	Date	Initials
Radon Test Kits Deployed	03/01/2022	PM
Radon Test Kits Collected	03/04/2022	PM
Radon Test Kits Shipped to Lab*	03/04/2022	PM
Radon Test Kits Received by Lab*	03/07/2022	PM

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