



MCPS RADON TESTING – EXECUTIVE SUMMARY

Site Name	Cashell Elementary School
Date of Test Report	1/12/2023
Round of Testing	Initial Follow-up Post Remediation 2 Year Testing 5 Year Testing HVAC Upgrade Window Replacement New Addition New Facility
# Rooms Tested	44
# Rooms \geq 4.0 pCi/L	0
Lowest Value	<0.3 pCi/L
Highest Value	0.6 pCi/L

Project Status:

1. 5-Year retesting completed.



January 12, 2023

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

Re: **Radon Testing Services**
KCI Job # 122210551

Location: Cashell Elementary School
17101 Cashell Road
Rockville, MD 20853

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 Cashell Elementary School, located at 17101 Cashell Rd. Rockville, MD 20853 (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 December 12, 2022 and deployed fifty (50) 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 December 15, 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 temperatures were between 22°F and 53°F. Maximum sustained winds ranged from 0-20 miles per hour. Average humidity was around 70% with 1.98 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 1- Radon Testing Results		
Cashell ES		
Test Period: 12/12/2022 - 12/15/2022		
Kit Number	Room / Area	Result
11285213	103	< 0.3
11285201	104	< 0.3
11285202	106	< 0.3
11285212	106	< 0.3
11285225	107	< 0.3
11285203	108	< 0.3
11285218	109	0.5
11285208	111	< 0.3
11285211	118	< 0.3
11285210	120	< 0.3
11285235	123	< 0.3
11285206	124	< 0.3
11285204	126	< 0.3
11285209	130	< 0.3
11285205	134	< 0.3
11285214	138	< 0.3
11285219	138	< 0.3
11285220	138	< 0.3
11285222	142	< 0.3
11285217	146	< 0.3
11285242	150	< 0.3
11285221	152	< 0.3
11285215	156	< 0.3
11285207	164	< 0.3
11285229	164	< 0.3
11285234	168	< 0.3
11285233	172	< 0.3
11285239	174	< 0.3
11285227	184	< 0.3
11285238	186	< 0.3
11285243	209	< 0.3
11285244	228	< 0.3
11287498	100B	< 0.3
11287495	100C	< 0.3
11287496	100D	< 0.3
11287494	100G	< 0.3
11287500	100H	0.6
11287499	102B	< 0.3
11285237	121A	< 0.3
11285228	137A	0.5
11285226	178A	< 0.3
11285230	CAFETERIA 115	< 0.3

Table 1- Radon Testing Results		
Cashell ES		
Test Period: 12/12/2022 - 12/15/2022		
Kit Number	Room / Area	Result
11285236	CAFETERIA 115	< 0.3
11285216	GYM 137	< 0.3
11285223	GYM 137	< 0.3
11287488	HEALTH SUITE 102	< 0.3
11287497	MAIN OFFICE 100	< 0.3
11285224	MEDIA CENTER 178	< 0.3
11285231	MEDIA CENTER 178	< 0.3
11285232	MEDIA CENTER 178	< 0.3

Table 2- Radon Testing Results			
Cashell ES			
Test Period: 12/12/22 - 12/15/22			
Kit Number	QC Type	Room / Area	Result
11285212	D	106	< 0.3
11285219	D	138	< 0.3
11285220	FB	138	< 0.3
11285229	D	164	< 0.3
11285232	D	Media Center 178	< 0.3
11285231	FB	Media Center 178	< 0.3
11286981	OB	OFFICE BLANK	< 0.3
11286982	TB	TRAVEL BLANK	< 0.3

ATTACHMENT C

Laboratory Analytical Results

December 19, 2022

**** LABORATORY ANALYSIS REPORT ****

Radon test result report for:

Kit #	Room Id	Started	Ended	pCi/L	Analyzed
11287498	100B	2022-12-12 @ 9:00 am	2022-12-15 @ 10:00 am	< 0.3	2022-12-19
11287499	102B	2022-12-12 @ 9:00 am	2022-12-15 @ 10:00 am	< 0.3	2022-12-19
11285225	107	2022-12-12 @ 10:00 am	2022-12-15 @ 11:00 am	< 0.3	2022-12-19
11285218	109	2022-12-12 @ 10:00 am	2022-12-15 @ 11:00 am	0.5 ± 0.3	2022-12-19
11285222	142	2022-12-12 @ 10:00 am	2022-12-15 @ 11:00 am	< 0.3	2022-12-19
11285217	146	2022-12-12 @ 10:00 am	2022-12-15 @ 11:00 am	< 0.3	2022-12-19
11287488	HEALTH SUITE 102	2022-12-12 @ 9:00 am	2022-12-15 @ 10:00 am	< 0.3	2022-12-19
11287497	MAIN OFFICE 100	2022-12-12 @ 9:00 am	2022-12-15 @ 10:00 am	< 0.3	2022-12-19

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

Radon test result report for:**MAIN**

Kit #	Room Id	Started	Ended	pCi/L	Analyzed
11287495	100C	2022-12-12 @ 9:00 am	2022-12-15 @ 10:00 am	< 0.3	2022-12-19
11287496	100D	2022-12-12 @ 9:00 am	2022-12-15 @ 10:00 am	< 0.3	2022-12-19
11287494	100G	2022-12-12 @ 9:00 am	2022-12-15 @ 10:00 am	< 0.3	2022-12-19
11287500	100H	2022-12-12 @ 9:00 am	2022-12-15 @ 10:00 am	0.6 ± 0.4	2022-12-19
11285213	103	2022-12-12 @ 9:00 am	2022-12-15 @ 11:00 am	< 0.3	2022-12-19
11285201	104	2022-12-12 @ 9:00 am	2022-12-15 @ 11:00 am	< 0.3	2022-12-19
11285202	106	2022-12-12 @ 9:00 am	2022-12-15 @ 11:00 am	< 0.3	2022-12-19
11285212	106	2022-12-12 @ 9:00 am	2022-12-15 @ 11:00 am	< 0.3	2022-12-19
11285203	108	2022-12-12 @ 9:00 am	2022-12-15 @ 11:00 am	< 0.3	2022-12-19
11285208	111	2022-12-12 @ 10:00 am	2022-12-15 @ 11:00 am	< 0.3	2022-12-19
11285211	118	2022-12-12 @ 9:00 am	2022-12-15 @ 11:00 am	< 0.3	2022-12-19
11285210	120	2022-12-12 @ 9:00 am	2022-12-15 @ 11:00 am	< 0.3	2022-12-19
11285237	121A	2022-12-12 @ 11:00 am	2022-12-15 @ 11:00 am	< 0.3	2022-12-19
11285235	123	2022-12-12 @ 10:00 am	2022-12-15 @ 11:00 am	< 0.3	2022-12-19
11285206	124	2022-12-12 @ 9:00 am	2022-12-15 @ 11:00 am	< 0.3	2022-12-19
11285204	126	2022-12-12 @ 9:00 am	2022-12-15 @ 11:00 am	< 0.3	2022-12-19
11285209	130	2022-12-12 @ 9:00 am	2022-12-15 @ 11:00 am	< 0.3	2022-12-19
11285205	134	2022-12-12 @ 9:00 am	2022-12-15 @ 11:00 am	< 0.3	2022-12-19
11285228	137A	2022-12-12 @ 10:00 am	2022-12-15 @ 11:00 am	0.5 ± 0.3	2022-12-19
11285220	138	2022-12-12 @ 9:00 am	2022-12-15 @ 11:00 am	< 0.3	2022-12-19
11285219	138	2022-12-12 @ 9:00 am	2022-12-15 @ 11:00 am	< 0.3	2022-12-19
11285214	138	2022-12-12 @ 9:00 am	2022-12-15 @ 11:00 am	< 0.3	2022-12-19
11285242	150	2022-12-12 @ 11:00 am	2022-12-15 @ 11:00 am	< 0.3	2022-12-19
11285221	152	2022-12-12 @ 10:00 am	2022-12-15 @ 11:00 am	< 0.3	2022-12-19
11285215	156	2022-12-12 @ 10:00 am	2022-12-15 @ 11:00 am	< 0.3	2022-12-19
11285207	164	2022-12-12 @ 10:00 am	2022-12-15 @ 11:00 am	< 0.3	2022-12-19
11285229	164	2022-12-12 @ 10:00 am	2022-12-15 @ 11:00 am	< 0.3	2022-12-19
11285234	168	2022-12-12 @ 10:00 am	2022-12-15 @ 11:00 am	< 0.3	2022-12-19
11285233	172	2022-12-12 @ 10:00 am	2022-12-15 @ 11:00 am	< 0.3	2022-12-19
11285239	174	2022-12-12 @ 11:00 am	2022-12-15 @ 10:00 am	< 0.3	2022-12-19
11285226	178A	2022-12-12 @ 10:00 am	2022-12-15 @ 11:00 am	< 0.3	2022-12-19
11285227	184	2022-12-12 @ 10:00 am	2022-12-15 @ 11:00 am	< 0.3	2022-12-19
11285238	186	2022-12-12 @ 11:00 am	2022-12-15 @ 11:00 am	< 0.3	2022-12-19
11285243	209	2022-12-12 @ 11:00 am	2022-12-15 @ 12:00 pm	< 0.3	2022-12-19
11285244	228	2022-12-12 @ 11:00 am	2022-12-15 @ 12:00 pm	< 0.3	2022-12-19
11285230	CAFETERIA 115	2022-12-12 @ 11:00 am	2022-12-15 @ 11:00 am	< 0.3	2022-12-19
11285236	CAFETERIA 115	2022-12-12 @ 11:00 am	2022-12-15 @ 11:00 am	< 0.3	2022-12-19

December 19, 2022

**** LABORATORY ANALYSIS REPORT ****

Radon test result report for:

MAIN

Kit #	Room Id	Started	Ended	pCi/L	Analyzed
11285223	GYM 137	2022-12-12 @ 10:00 am	2022-12-15 @ 11:00 am	< 0.3	2022-12-19
11285216	GYM 137	2022-12-12 @ 10:00 am	2022-12-15 @ 11:00 am	< 0.3	2022-12-19
11285231	MEDIA CENTER 178	2022-12-12 @ 10:00 am	2022-12-15 @ 11:00 am	< 0.3	2022-12-19
11285232	MEDIA CENTER 178	2022-12-12 @ 10:00 am	2022-12-15 @ 11:00 am	< 0.3	2022-12-19
11285224	MEDIA CENTER 178	2022-12-12 @ 10:00 am	2022-12-15 @ 11:00 am	< 0.3	2022-12-19

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 – April 2022 Schools – Retesting

Name of Schools:

1. Meadow Hall ES
2. Bayard Rustin ES
3. Lucy V. Barnsley ES
4. Cashell ES
5. Wheaton Woods ES
6. Winston Churchill HS

	Date	Initials
Radon Test Kits Deployed	12/12/2022	BMM
Radon Test Kits Collected	12/15/2022	BMM
Radon Test Kits Shipped to Lab*	12/15/2022	BMM
Radon Test Kits Received by Lab*	12/19/2022	BMM

*All samples sent to Air Check, Inc., 2 Saber Way, Ward Hill, MA 01835



MONTGOMERY COUNTY PUBLIC SCHOOLS RADON TESTING

Executive Summary: Cashell Elementary School

17101 Cashell Road
Rockville, MD 20853

Date of Test Report:	3/15/2019
Round of Testing:	Initial Follow-up Post Remediation 2 Year Testing 5 Year Testing HVAC Upgrade Window Replacement New Addition New Facility
# of Rooms Tested:	7
# of Rooms \geq 4.0 pCi/L:	0
Low Value:	<0.4
High Value:	1.5

Project Status

Retesting completed: No further action at this time.



March 15, 2019

Mr. Richard Cox
Indoor Air Quality Team Leader
Montgomery County Public Schools
850 Hungerford Drive
Rockville, MD 20850

Re: Radon Testing Services

Location: Cashell Elementary School
17101 Cashell Road,
Rockville, MD 20853

Dear Mr. Cox:

Intertek-PSI (PSI) is pleased to submit the following report to the Montgomery County Public Schools (MCPS) for completion of a "short-term" 3-day radon test for Cashell Elementary School, located at 17101 Cashell Road, Rockville, MD 20853 (subject site).

Scope of Services:

PSI 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. PSI 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 Safety Board (NRSB) Radon Measurement Specialist (certification #14SS007) supervised the testing. Additional information on radon management and the health effects of radon exposure is available from www.montgomerycountymd.gov/dep/air/radon or www.epa.gov/radon.

PSI visited the site on February 26, 2019 and deployed seven (7) activated charcoal (AC) radon test kit. PSI deployed radon test kits in frequently-occupied ground contact rooms, and other areas, (if applicable) in accordance with AARST guidance. PSI returned to the site on March 01, 2019 to retrieve the radon sampling test kit. A floor plan map of the building with the test location is included as Attachment A of this report.

PSI shipped all radon tests via overnight delivery to AccuStar Labs for analysis by gamma-ray spectroscopy. Accustar Labs is a NRSB certified analytical laboratory for radon analysis located at 929 Mount Zion Road, Lebanon, Pennsylvania (certification # ARLO007).

Evaluation of Testing Conditions:

The operating condition that represents the greatest amount of significantly occupied time for this building is; heating active, with outdoor temperature averages $\leq 65^{\circ}\text{F}$.

PSI concludes that the test period reasonably represents normal conditions when the building is significantly occupied. Clear characterization of the radon hazard is most likely to be observed under this normal operating condition. Based on the evaluation of test conditions, this test should reasonably characterize radon hazards.



PSI also conducted observations of field conditions which could affect the results of the test and compiled weather data for the testing period. PSI recorded observations of the following conditions in each room at 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.

Results:

The results of the radon test analysis indicated the following:

Radon Concentration	Room	Result
≥ 4.0 pCi/L	None	NA
≤ 4.0 pCi/L	See Attachment B	

Notes:
D -Duplicate Sample

The office blank and lab transit blanks had test results of less than the laboratory detection limit of 0.4 pCi/L. Review of the duplicate sample analysis indicates that adequate laboratory measurement precision was achieved. The Spike sample analysis results indicate the laboratory is operating within statistical control limits.

The sampling locations, field observations, and analytical results are listed on Table 1 (Attachment B). The laboratory analytical results are also attached (Attachment C).

Laboratory results and exposure data for the spike samples are also included in Attachment C. 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 (703) 698-9300.

ATTACHMENT B

Radon Test Summary Spreadsheet

Radon Testing Results		
Cashell Elementary School		
Testing period: 2/26/19 - 3/01/19		
Kit Number	Room / Area	Result (pCi/L)
3923392	102A	0.8
3923393	102B	0.8
3923399	121A	0.7
3923400	137A	<0.4
3923395	178A2	1.5
3923396	178B	1.1
3923398	186	0.5

Table Notes:

D – Duplicate

FB – Field Blank

OB – Office Blank

TB – Transit Blank

QC – Quality Control

ATTACHMENT C

Laboratory Analytical Results

NRPP 105011 AL
NRSB ARL0007

EPA Method #402-R-92-004
Charcoal Canister
NRPP Device Code 6048
NRSB Device Code 10317

Laboratory Report for:

Property Tested: Project # 04481387-1

Intertek-PSI (VA)
2930 Eskridge Road
Fairfax VA 22031

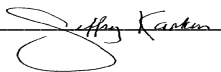
MCPS Radon Survey Cashell ES
17101 Cashell Road
Rockville MD 20853


Log Number	Device Number	Test Exposure Duration:			Area Tested	Result pCi/L
3220718	3923392	02/26/2019	7:38 am	03/01/2019 7:40 am	Floor Main level Room 102A	0.8
3220719	3923393	02/26/2019	7:45 am	03/01/2019 7:42 am	Floor Main level Room 102B	0.8
3220720	3923395	02/26/2019	7:52 am	03/01/2019 7:47 am	Floor Main level Room 178A2	1.5
3220721	3923396	02/26/2019	7:59 am	03/01/2019 7:48 am	Floor Main level Room 178B	1.1
3220722	3923398	02/26/2019	8:06 am	03/01/2019 7:50 am	Floor Main level Room 186	0.5
3220723	3923399	02/26/2019	8:13 am	03/01/2019 7:53 am	Floor Main level Room 121A	0.7
3220724	3923400	02/26/2019	8:20 am	03/01/2019 7:56 am	Floor Main level Room 137A	< 0.4

Comment: A copy of this report was e-mailed to Intertek-PSI (VA)

Distributed by: Intertek-PSI (VA)

Date Received: 03/04/2019 Date Logged: 03/04/2019 Date Analyzed: 03/05/2019 Date Reported: 03/05/2019

Report Reviewed By: 

Report Approved By: 

Disclaimer:

The uncertainty of this radon measurement is +/- 10 %. Factors contributing to uncertainty include statistical variations, daily and seasonal variations in radon concentrations, sample collection techniques and operation of the dwelling. Interference with test conditions may influence the test results.

Shawn Price, Director of Laboratory Operations, AccuStar Labs

This report may only be transferred to a third party in its entirety. Analytical results relate to the samples AS RECEIVED BY THE LABORATORY. Results shown on this report represent levels of radon gas measured between the dates shown in the room or area of the site identified above as "Property Tested". Incorrect information will affect results. The results may not be construed as either predictive or supportive of measurements conducted in any area of this structure at any other time. AccuStar Labs, its employees and agents are not responsible for the consequences of any action taken or not taken based upon the results reported or any verbal or written interpretation of the results.



MONTGOMERY COUNTY PUBLIC SCHOOLS RADON TESTING

Executive Summary:
Cashell Elementary School
17101 Cashell Road
Rockville, MD 20853

Date of Test Report:	2/13/2019
Round of Testing:	Initial Follow-up Post Remediation 2 Year Testing 5 Year Testing HVAC Upgrade Window Replacement New Addition New Facility
# of Rooms Tested:	40
# of Rooms \geq 4.0 pCi/L:	0
Low Value:	< 0.4
High Value:	0.6

Project Status

Initial testing complete: Missing or compromised samples need re-test.



February 13, 2019

Mr. Richard Cox
Indoor Air Quality Team Leader
Montgomery County Public Schools
850 Hungerford Drive
Rockville, MD 20850

Re: Radon Testing Services

Location: Cashell Elementary School
17101 Cashell Road,
Rockville, MD 20853

Dear Mr. Cox:

Intertek-PSI (PSI) is pleased to submit the following report to the Montgomery County Public Schools (MCPS) for completion of a “short-term” 3-day radon test for Cashell Elementary School, located at 17101 Cashell Road, Rockville, MD 20853 (subject site).

Scope of Services:

PSI 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. PSI 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 Safety Board (NRSB) Radon Measurement Specialist (certification #14SS007) supervised the testing. Additional information on radon management and the health effects of radon exposure is available from www.montgomerycountymd.gov/dep/air/radon or www.epa.gov/radon.

PSI visited the site on November 12, 2018 and deployed fifty-two (52) activated charcoal (AC) radon test kits. PSI deployed radon test kits in frequently-occupied ground contact rooms, and other areas, (if applicable) in accordance with AARST guidance. PSI returned to the site on November 15, 2018 to retrieve the radon sampling test kits. A floor plan map of the building with the test locations is included as Attachment A of this report.

As a quality control measure, PSI included duplicate samples, field blanks, lab transit blanks, and office blanks in accordance with AARST recommendations. In addition, PSI submitted ten (10) test kits to Bowser-Morner Inc. as spike samples. The spiked tests were exposed to a known radon concentration by Bowser-Morner Inc. prior to being returned to the laboratory for analysis.

PSI shipped all radon tests via overnight delivery to AccuStar Labs for analysis by gamma-ray spectroscopy. Accustar Labs is a NRSB certified analytical laboratory for radon analysis located at 929 Mount Zion Road, Lebanon, Pennsylvania (certification # ARL0007) and 2 Saber Way, Haverhill, Massachusetts (certification # ARL0017).



Evaluation of Testing Conditions:

The operating condition that represents the greatest amount of significantly occupied time for this building is; heating active, with outdoor temperature averages $\leq 65^{\circ}\text{F}$.

PSI concludes that the test period reasonably represents normal conditions when the building is significantly occupied. Clear characterization of the radon hazard is most likely to be observed under this normal operating condition. Based on the evaluation of test conditions, this test should reasonably characterize radon hazards.

PSI also conducted observations of field conditions which could affect the results of the test and compiled weather data for the testing period. PSI recorded observations of the following conditions in each room at 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.

Results:

The results of the radon test analysis indicated the following:

Radon Concentration	Room	Result
≥ 4.0 pCi/L	None	NA
≤ 4.0 pCi/L	See Attachment B	

Notes:
D -Duplicate Sample

The office blank and lab transit blanks had test results of less than the laboratory detection limit of 0.4 pCi/L. Review of the duplicate sample analysis indicates that adequate laboratory measurement precision was achieved. The Spike sample analysis results indicate the laboratory is operating within statistical control limits.

The sampling locations, field observations, and analytical results are listed on Table 1 (Attachment B). The laboratory analytical results are also attached (Attachment C).

Laboratory results and exposure data for the spike samples are also included in Attachment C. 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 (703) 698-9300.



Respectfully Submitted,

INTERTEK-PSI

A handwritten signature in black ink that reads "Nand Kaushik". The signature is written in a cursive style.

Nand Kaushik, P.E.
Department Manager, Environmental Services
Nand.Kaushik@intertek.com

Attachments: A – Floor Plan with Test Locations
 B – Table 1 – Radon Test Summary Spreadsheet
 C – Laboratory Analytical Results

ATTACHMENT B

Radon Test Summary Spreadsheet

Radon Testing Results		
Cashell Elementary School		
Testing period: 11/12/18 - 11/15/18		
Kit Number	Room / Area	Result (pCi/L)
3916964	100	< 0.4
3916965	100B	<0.4
3916968	100C	< 0.4
3916967	100D	0.5
3916981	100G	< 0.4
3916969	100H	< 0.4
3916966	102	<0.4
--	102A (Missed)	--
--	102B (Missed)	--
--	102C (Missed)	--
3917101	103	< 0.4
3916961	104	< 0.4
3917100	106	< 0.4
3917103	107	< 0.4
3917099	108	< 0.4
3917105	109	< 0.4
3917035	111	< 0.4
3881273	115	0.4
3881272	115	<0.4
3917098	118	0.4
3917096	120	0.4
3917033	121	0.4
3917039	121	< 0.4
--	121A (Missed)	--
3917034	123	< 0.4
3917095	124	< 0.4
3917094	126	< 0.4
3917092	130	< 0.4
--	132A (Missed)	--
3917091	134	< 0.4
3881265	137	<0.4
3881266	137	<0.4
3917102	138	< 0.4
3917104	142	< 0.4
3917106	146	< 0.4
3917108	150	< 0.4
3917109	152	< 0.4
3917110	156	< 0.4
3917031	164	0.4
3917040	168	< 0.4
--	168A (Missed)	--
3917036	172	< 0.4
3916962	174	< 0.4
3916982	178	0.5
3916983	178	0.5
3916984	178A	0.4
--	178A2 (Missed)	--
--	178B (Missed)	--
3917032	184	< 0.4
--	186 (Missed)	--
3916985	202	< 0.4
3916987	232	< 0.4

Radon Testing Results		
Cashell Elementary School		
Testing period: 11/12/18 - 11/15/18		
Kit Number	QC Type	Result (pCi/L)
3917037	121 (D)	0.6
3917093	130 (D)	< 0.4
3917038	172 (D)	< 0.4
3916963	174 (D)	< 0.4
3916986	202 (D)	< 0.4
3917107	Field Blank	< 0.4
3917097	Field Blank	< 0.4
3917936	Office Blank	< 0.4
3916305	Transit Blank	< 0.4

Table Notes:

D – Duplicate

FB – Field Blank

OB – Office Blank

TB – Transit Blank

QC – Quality Control

ATTACHMENT C

Laboratory Analytical Results

NRPP 105011 AL
NRSB ARL0007

EPA Method #402-R-92-004
Charcoal Canister
NRPP Device Code 6048
NRSB Device Code 10317

Laboratory Report for:

Property Tested: Project # 04481387-1

Intertek-PSI (VA)
2930 Eskridge Road
Fairfax VA 22031

MCPS Radon Survey Cashell ES
17101 Cashell Road
Rockville MD 20853

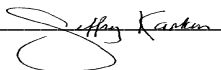
Log Number	Device Number	Test Date	Exposure Start	Exposure End	Area Tested	Result pCi/L
3195484	3916965	11/12/2018	8:47 am	11/15/2018 7:32 am	First Floor Room 100B	< 0.4
3195485	3917107	11/12/2018	6:53 am	11/15/2018 6:31 am	First Floor Blank	< 0.4
3195486	3916966	11/12/2018	8:52 am	11/15/2018 7:32 am	First Floor Room 102	< 0.4
3195487	3917097	11/12/2018	6:53 am	11/15/2018 6:31 am	First Floor Blank	< 0.4
3195488	3917039	11/12/2018	6:58 am	11/15/2018 6:39 am	First Floor Room 121	< 0.4
3195489	3917033	11/12/2018	7:01 am	11/15/2018 6:47 am	First Floor Room 121	0.4
3195490	3917037	11/12/2018	7:01 am	11/15/2018 6:47 am	Floor First Room 121 Duplicate	0.6
3195491	3917034	11/12/2018	7:08 am	11/15/2018 6:49 am	First Floor Room 123	< 0.4
3195492	3917032	11/12/2018	7:15 am	11/15/2018 6:50 am	First Floor Room 184	< 0.4
3195493	3917036	11/12/2018	7:29 am	11/15/2018 6:54 am	First Floor Room 172	< 0.4
3195494	3917038	11/12/2018	7:29 am	11/15/2018 6:54 am	First Floor Room 172 Duplicate	< 0.4


Comment: AMENDED REPORT for 3916965 & 3916966 on 1-15-19 to add corrected dates and times.

Test Performed By: Lian Zadeng

Distributed by: Intertek-PSI (VA)

Date Received: 11/18/2018 Date Logged: 11/18/2018 Date Analyzed: 11/17/2018 Date Reported: 11/30/2018

Report Reviewed By: 

Report Approved By: 

Shawn Price, Director of Laboratory Operations, AccuStar Labs

Disclaimer:

The uncertainty of this radon measurement is +/- 10 %. Factors contributing to uncertainty include statistical variations, daily and seasonal variations in radon concentrations, sample collection techniques and operation of the dwelling. Interference with test conditions may influence the test results.

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NRPP 105011 AL
NRSB ARL0007

EPA Method #402-R-92-004
Charcoal Canister
NRPP Device Code 6048
NRSB Device Code 10317

Laboratory Report for:

Property Tested: Project # 04481387-1

Intertek-PSI (VA)
2930 Eskridge Road
Fairfax VA 22031

MCPS Radon Survey Cashell ES
17101 Cashell Road
Rockville MD 20853

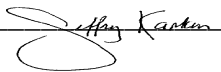
Log Number	Device Number	Test Exposure	Duration:	Area Tested	Result pCi/L
3195495	3917040	11/12/2018 7:33 am	11/15/2018 6:55 am	First Floor Room 168	< 0.4
3195496	3917031	11/12/2018 7:39 am	11/15/2018 6:57 am	First Floor Room 164	0.4
3195497	3917035	11/12/2018 7:43 am	11/15/2018 6:58 am	First Floor Room 111	< 0.4
3195498	3917110	11/12/2018 7:48 am	11/15/2018 7:00 am	First Floor Room 156	< 0.4
3195499	3917109	11/12/2018 7:50 am	11/15/2018 7:02 am	First Floor Room 152	< 0.4
3195500	3917108	11/12/2018 7:56 am	11/15/2018 7:03 am	Floor First Room 150	< 0.4
3195501	3917106	11/12/2018 7:57 am	11/15/2018 7:04 am	Floor First Room 146	< 0.4
3195502	3917105	11/12/2018 8:01 am	11/15/2018 7:05 am	Floor First Room 109	< 0.4
3195503	3917104	11/12/2018 8:12 am	11/15/2018 7:06 am	Floor First Room 142	< 0.4
3195504	3917103	11/12/2018 8:14 am	11/15/2018 7:07 am	Floor First Room 107	< 0.4
3195505	3917102	11/12/2018 8:16 am	11/15/2018 7:09 am	Floor First Room 138	< 0.4

Comment: AMENDED REPORT for 3916965 & 3916966 on 1-15-19 to add corrected dates and times.

Test Performed By: Lian Zadeng

Distributed by: Intertek-PSI (VA)

Date Received: 11/18/2018 Date Logged: 11/18/2018 Date Analyzed: 11/17/2018 Date Reported: 11/30/2018

Report Reviewed By: 

Report Approved By: 

Disclaimer:

The uncertainty of this radon measurement is +/- 10 %. Factors contributing to uncertainty include statistical variations, daily and seasonal variations in radon concentrations, sample collection techniques and operation of the dwelling. Interference with test conditions may influence the test results.

Shawn Price, Director of Laboratory Operations, AccuStar Labs

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NRPP 105011 AL
NRSB ARL0007

EPA Method #402-R-92-004
Charcoal Canister
NRPP Device Code 6048
NRSB Device Code 10317

Laboratory Report for:

Property Tested: Project # 04481387-1

Intertek-PSI (VA)
2930 Eskridge Road
Fairfax VA 22031

MCPS Radon Survey Cashell ES
17101 Cashell Road
Rockville MD 20853

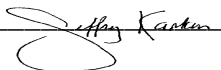
Log Number	Device Number	Test Exposure Duration:		Area Tested	Result pCi/L
3195506	3917101	11/12/2018 8:18 am	11/15/2018 7:10 am	Floor First Room 103	< 0.4
3195507	3917091	11/12/2018 8:21 am	11/15/2018 7:11 am	Floor First Room 134	< 0.4
3195508	3917092	11/12/2018 8:24 am	11/15/2018 7:12 am	Floor First Room 130	< 0.4
3195509	3917093	11/12/2018 8:24 am	11/15/2018 7:12 am	Floor First Room 130 Duplicate	< 0.4
3195510	3917094	11/12/2018 8:27 am	11/15/2018 7:14 am	Floor First Room 126	< 0.4
3195511	3917095	11/12/2018 8:28 am	11/15/2018 7:15 am	Floor First Room 124	< 0.4
3195512	3917096	11/12/2018 8:31 am	11/15/2018 7:18 am	Floor First Room 120	0.4
3195513	3917098	11/12/2018 8:34 am	11/15/2018 7:20 am	Floor First Room 118	0.4
3195514	3917099	11/12/2018 8:36 am	11/15/2018 7:21 am	Floor First Room 108	< 0.4
3195515	3917100	11/12/2018 8:38 am	11/15/2018 7:23 am	Floor First Room 106	< 0.4
3195516	3916961	11/12/2018 8:40 am	11/15/2018 7:25 am	Floor First Room 104	< 0.4


Comment: AMENDED REPORT for 3916965 & 3916966 on 1-15-19 to add corrected dates and times.

Test Performed By: Lian Zadeng

Distributed by: Intertek-PSI (VA)

Date Received: 11/18/2018 Date Logged: 11/18/2018 Date Analyzed: 11/17/2018 Date Reported: 11/30/2018

Report Reviewed By: 

Report Approved By: 

Shawn Price, Director of Laboratory Operations, AccuStar Labs

Disclaimer:

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NRPP 105011 AL
NRSB ARL0007

EPA Method #402-R-92-004
Charcoal Canister
NRPP Device Code 6048
NRSB Device Code 10317

Laboratory Report for:

Property Tested: Project # 04481387-1

Intertek-PSI (VA)
2930 Eskridge Road
Fairfax VA 22031

MCPS Radon Survey Cashell ES
17101 Cashell Road
Rockville MD 20853

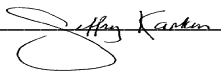
Log Number	Device Number	Test Exposure Duration:		Area Tested	Result pCi/L
3195517	3916962	11/12/2018 8:43 am	11/15/2018 7:29 am	Floor First Room 174	< 0.4
3195518	3916963	11/12/2018 8:43 am	11/15/2018 7:29 am	Floor First Room 174 Duplicate	< 0.4
3195519	3916964	11/12/2018 8:46 am	11/15/2018 7:30 am	Floor First Room 100	< 0.4
3195520	3916969	11/12/2018 9:01 am	11/15/2018 7:34 am	Floor First Room 100H	< 0.4
3195521	3916981	11/12/2018 9:02 am	11/15/2018 7:36 am	Floor First Room 100G	< 0.4
3195522	3916967	11/12/2018 9:03 am	11/15/2018 7:37 am	Floor First Room 100D	0.5
3195523	3916968	11/12/2018 9:05 am	11/15/2018 7:38 am	Floor First Room 100C	< 0.4
3195524	3916982	11/12/2018 9:07 am	11/15/2018 7:52 am	Floor First Room 178	0.5
3195525	3916983	11/12/2018 9:09 am	11/15/2018 7:53 am	Floor First Room 178	0.5
3195526	3916984	11/12/2018 9:11 am	11/15/2018 7:54 am	Floor First Room 178A	0.4
3195527	3916985	11/12/2018 9:14 am	11/15/2018 7:57 am	Floor Second Room 202	< 0.4

Comment: AMENDED REPORT for 3916965 & 3916966 on 1-15-19 to add corrected dates and times.

Test Performed By: Lian Zadeng

Distributed by: Intertek-PSI (VA)

Date Received: 11/18/2018 Date Logged: 11/18/2018 Date Analyzed: 11/17/2018 Date Reported: 11/30/2018

Report Reviewed By: 

Report Approved By: 

Disclaimer:

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Shawn Price, Director of Laboratory Operations, AccuStar Labs

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NRPP 105011 AL
NRSB ARL0007

EPA Method #402-R-92-004
Charcoal Canister
NRPP Device Code 6048
NRSB Device Code 10317

Laboratory Report for:

Property Tested: Project # 04481387-1

Intertek-PSI (VA)
2930 Eskridge Road
Fairfax VA 22031

MCPS Radon Survey Cashell ES
17101 Cashell Road
Rockville MD 20853

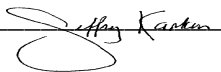
Log Number	Device Number	Test Exposure Duration:		Area Tested	Result pCi/L
3195528	3916986	11/12/2018 9:14 am	11/15/2018 7:57 am	Floor Second Room 202 Duplicate	< 0.4
3195529	3916987	11/12/2018 9:17 am	11/15/2018 7:58 am	Floor Second Room 232	< 0.4
3195530	3917936	11/12/2018 6:00 am	11/15/2018 4:10 pm	Floor NA Blank	< 0.4
3195531	3916305	11/12/2018 6:00 am	11/15/2018 4:10 pm	Floor NA Blank	< 0.4


Comment: AMENDED REPORT for 3916965 & 3916966 on 1-15-19 to add corrected dates and times.

Test Performed By: Lian Zadeng

Distributed by: Intertek-PSI (VA)

Date Received: 11/18/2018 Date Logged: 11/18/2018 Date Analyzed: 11/17/2018 Date Reported: 11/30/2018

Report Reviewed By: 

Report Approved By: 

Disclaimer:

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NELAC NY 11769
NRPP 103216 AL
NRSB ARL0017

EPA Method #402-R-92-004
Liquid Scintillation
NRPP Device Code 8088
NRSB Device Code 12193

Laboratory Report for:

Property Tested: Project # 04481387-1

Intertek-PSI (VA)
2930 Eskridge Road
Fairfax VA 22031


MCPS Radon Survey
17101 Cashell Rd.
Rockville MD 20853


Log Number	Device Number	Test Exposure Duration:		Area Tested	Result pCi/L
2393094	3881265	11/12/2018 7:23 am	11/15/2018 6:51 am	First Floor Room 137	<0.4
2393095	3881266	11/12/2018 7:24 am	11/15/2018 6:52 am	First Floor Room 137	<0.4
2393101	3881272	11/12/2018 6:54 am	11/15/2018 6:37 am	First Floor Room 115	<0.4
2393102	3881273	11/12/2018 6:54 am	11/15/2018 6:37 am	First Floor Room 115	0.4

Comment: A copy of this report was emailed to Intertek-PSI (VA).

Distributed by: Intertek-PSI (VA)

Date Received: 11/18/2018 Date Logged: 11/18/2018 Date Analyzed: 11/19/2018 Date Reported: 12/17/2018

Report Reviewed By: 

Report Approved By: 

Disclaimer:

Shawn Price, Director of Laboratory Operations, AccuStar Labs

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NRPP 105011 AL
NRSB ARL0007
Ohio RL41

EPA Method #402-R-92-004
Charcoal Canister
NRPP Device Code 6048
NRSB Device Code 10317

Laboratory Report for:

Property Tested:

Intertek-PSI (VA)
2930 Eskridge Road
Fairfax VA 22031

MCPS Radon Survey
4514 Taylorsville Road
Dayton OH 45424

Log Number	Device Number	Test	Exposure	Duration:	Area Tested	Result pCi/L
3204125	3926831	12/07/2018	9:47 am	12/10/2018 9:47 am	Spike	36.1
3204126	3926832	12/07/2018	9:47 am	12/10/2018 9:47 am	Spike	34.8
3204127	3926833	12/07/2018	9:47 am	12/10/2018 9:47 am	Spike	33.7
3204128	3926834	12/07/2018	9:47 am	12/10/2018 9:47 am	Spike	35.8
3204129	3926835	12/07/2018	9:47 am	12/10/2018 9:47 am	Spike	35.0
3204130	3926836	12/07/2018	9:47 am	12/10/2018 9:47 am	Spike	34.5
3204131	3926837	12/07/2018	9:47 am	12/10/2018 9:47 am	Spike	34.6
3204132	3926838	12/07/2018	9:47 am	12/10/2018 9:47 am	Spike	34.3
3204133	3926839	12/07/2018	9:47 am	12/10/2018 9:47 am	Spike	33.2
3204134	3926840	12/07/2018	9:47 am	12/10/2018 9:47 am	Spike	34.0

Comment: A copy of this report was e-mailed to Intertek-PSI (VA)

Test Performed By: Unknown

Distributed by: Intertek-PSI (VA)

Date Received: 12/12/2018 Date Logged: 12/12/2018 Date Analyzed: 12/12/2018 Date Reported: 12/13/2018

Report Reviewed By: 

Report Approved By: 

Disclaimer:

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EXPOSURE IN BOWSER-MORNER RADON CHAMBER

CLIENT Intertek - PSI

Job Number 187732

NOMINAL Conditions: Radon Conc 32.6 pCi/L Rel. Hum 49.1 % Temp. 70.1 F

Date Start: 12/7/18 Date Stop: 12/10/18

Date Start: _____ Date Stop: _____

Time Start: 0947 Time Stop: 0947

Time Start: _____ Time Stop: _____

Device No.'s: (10) Char. Cans-

Device No.'s: _____

3926831 thru 3926840

G2 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



Chain of Custody

Project Name: MCPS Radon Survey 2018

Name of Schools:

- | | | |
|-------------------|----------------------|--------------------|
| 1. Arcola ES | 7. North Lake Center | 13. Cold Spring ES |
| 2. Glen Haven ES | 8. Barnsley ES | 14. Hoover MS |
| 3. Jackson Road | 9. Bayard Rustin ES | 15. Wayside ES |
| 4. Cashell ES | 10. Julius West MS | 16. English Manor |
| 5. Frost MS | 11. Rock Terrace HS | |
| 6. Meadow Hall ES | 12. Churchill HS | |

	Date	Initials
Radon Test Kits Deployed	11/12/2018	NL
Radon Test Kits Sampled	11/15/2018	NL
Radon Test Kits Shipped to Lab*	11/15/2018	NL
Radon Test Kits Received by Lab*	11/17/2018; 11/18/2018	NL

*All samples sent to AccuStar Laboratories, 929 Mount Zion Road, Lebanon, PA 17046 and 2 Saber Way, Haverhill, MA 01835



MCPS RADON TESTING

Executive Summary: Cashell Elementary School

Date of Test Report:	2/05/2016 (Rev 1)
Round of Testing:	Initial Follow-up Post Remediation
# Rooms Tested:	54
# Rooms \geq 4.0 pCi/L:	0
Low Value:	< 0.3
High Value:	2.0

Project Status:

Initial testing completed; no further action at this time.



February 5, 2016 (Rev 1)

Mr. Richard Cox
Indoor Air Quality Team Leader
Montgomery County Public Schools
850 Hungerford Drive
Rockville, MD 20850

Re: **Radon Testing Services**
KCI Job # 12146341.24

Location: Cashell Elementary School
17101 Cashell Road
Rockville, MD 20853

Dear Mr. Cox:

KCI Technologies, Inc. (KCI) is pleased to submit the following report to the Montgomery County Public Schools (MCPS) pursuant to completing a “short-term” 3 day radon test for the Cashell Elementary School, located at 17101 Cashell Road in Rockville, Maryland 20853 (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 Safety Board (NRSB) Radon Measurement Specialist (certification #14SS056) supervised the testing. Additional information on radon management and the health effects of radon exposure is available from www.montgomerycountymd.gov/dep/air/radon or www.epa.gov/radon.

KCI visited the site on January 11, 2016 and deployed sixty-eight (68) activated charcoal (AC) radon test kits. KCI deployed radon test kits in 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 included duplicate samples, field blanks, lab transit blanks, and office blanks in accordance with AARST recommendations. In addition, KCI submitted six (6) 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 14, 2016 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:

The operating condition that represents the greatest amount of significantly occupied time for this building is; heating active, with outdoor temperature averages $\leq 65^{\circ}$ F.

KCI concludes that the test period reasonably represents normal conditions when the building is significantly occupied. Clear characterization of the radon hazard is most likely to be observed under this normal operating condition. Based on the evaluation of test conditions, this test should reasonably characterize radon hazards.

KCI also conducted observations of field conditions which could affect the results of the test and compiled weather data for the testing period. KCI recorded observations of the following conditions in each room at 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.

Results:

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	

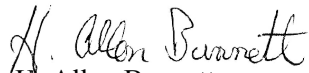
Notes:
D- Duplicate sample

All field blanks, office blank, and lab transit blanks had test results of less than the laboratory detection limit of 0.3 pCi/L. Review of the duplicate sample analysis indicates that adequate laboratory measurement precision was achieved. The Spike sample analysis results indicate the laboratory is operating within statistical control limits.

The sampling locations, field observations, and analytical results are listed on Table 1 (Attachment B). The laboratory analytical results are also attached (Attachment C). Laboratory results and exposure data for the spike samples are also included in Attachment C.

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) 316-7800.

Sincerely,



H. Allen Bennett

Certified Industrial Hygienist
KCI Technologies, Inc.

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

ATTACHMENT A

Floor Plan With Test Locations

ATTACHMENT B

Radon Test Summary Spreadsheet

Table Notes:

AC- Activated Charcoal

ACI- Air Chek, Inc.

D- Duplicate

FB- Field Blank

KCI- KCI Technologies, Inc.

OB- Office Blank

PM- Project Manager

QC- Quality Control

Radon Testing Results		
Cashell Elementary School		
Test Period: 01/11/16-01/14/16		
Kit Number	Room / Area	Result
7715193	100	0.9
7718802	102	1.1
7715154	103	0.9
7715191	104	0.8
7715144	106	1
7715158	107	1.1
7715146	108	1.1
7715161	109	< 0.3
7715165	111	0.8
7715181	115	< 0.3
7715182	115	0.7
7715149	118	1
7715150	120	1.9
7715183	121	< 0.3
7715180	123	< 0.3
7715151	124	1.6
7715152	126	1.6
7715148	130	1.3
7715153	134	1.1
7715175	137	< 0.3
7715176	137	< 0.3
7715156	138	0.7
7715159	142	0.6
7715160	146	2
7715162	150	< 0.3
7715163	152	0.6
7715164	156	0.7
7715166	164	< 0.3
7715167	168	0.6
7715169	172	< 0.3
7715192	174	1.2
7715186	178	1.2
7715187	178	1
7715172	182	1.6
7715173	184	0.9
7715174	186	< 0.3
7718807	209	0.9
7718806	232	0.8
7715195	100B	0.6
7715196	100C	1.1
7715197	100D	1.3
7715198	100E	0.7
7715199	100F	1.1
7715200	100G	0.7
7718801	100H	0.7
7718803	102A	1

Table Note:

* Missing or Compromised Sample

Radon Testing Results		
Cashell Elementary School		
Test Period: 01/11/16-01/14/16		
Kit Number	Room / Area	Result
7718804	102B	1.4
7718805	102C	1
7715145	108A	0.8
7715185	121A	0.7
7715179	137A	< 0.3
7715168	168A	0.5
7715188	178A	0.8
7715189	178A2	0.8
7715190	178B	0.8
7715171	180 A	< 0.3
7718809	PORT. 1	< 0.3

Table Note:

* Missing or Compromised Sample

Radon Testing Results		
Cashell Elementary School		
Test Period: 01/11/16-01/14/16		
Kit Number	QC Type	Result
7715194	D (100)	< 0.3
7715155	D (103)	0.8
7715147	D (108)	1.5
7715184	D (121)	< 0.3
7715178	D (137)	< 0.3
7715170	D (172)	< 0.3
7718808	D (209)	0.8
7715177	FB (137)	< 0.3
7715157	FB (138)	< 0.3
7718810	FB (PORT. 1)	< 0.3
7714559	OB (0)	< 0.3

Table Note:

* Missing or Compromised Sample

ATTACHMENT C

Laboratory Analytical Results

February
1,
2016

**LABORATORY ANALYSIS
REPORT ****

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

Kit #	Room Id	Started	Ended	pCi/L	Analyzed
7714559	0	2016-01-11 @ 4:00 pm	2016-01-14 @ 1:00 pm	< 0.3	2016-01-18
7715193	100	2016-01-11 @ 10:00 am	2016-01-14 @ 8:00 am	0.9 ± 0.3	2016-01-18
7715194	100	2016-01-11 @ 10:00 am	2016-01-14 @ 8:00 am	< 0.3	2016-01-20
7715195	100B	2016-01-11 @ 10:00 am	2016-01-14 @ 8:00 am	0.6 ± 0.4	2016-01-20
7715196	100C	2016-01-11 @ 10:00 am	2016-01-14 @ 8:00 am	1.1 ± 0.4	2016-01-20
7715197	100D	2016-01-11 @ 10:00 am	2016-01-14 @ 8:00 am	1.3 ± 0.5	2016-01-20
7715198	100E	2016-01-11 @ 10:00 am	2016-01-14 @ 8:00 am	0.7 ± 0.4	2016-01-20
7715199	100F	2016-01-11 @ 10:00 am	2016-01-14 @ 8:00 am	1.1 ± 0.4	2016-01-20
7715200	100G	2016-01-11 @ 10:00 am	2016-01-14 @ 8:00 am	0.7 ± 0.4	2016-01-20
7718801	100H	2016-01-11 @ 11:00 am	2016-01-14 @ 8:00 am	0.7 ± 0.4	2016-01-20
7718802	102	2016-01-11 @ 11:00 am	2016-01-14 @ 8:00 am	1.1 ± 0.4	2016-01-20
7718803	102A	2016-01-11 @ 11:00 am	2016-01-14 @ 8:00 am	1.0 ± 0.4	2016-01-20
7718804	102B	2016-01-11 @ 11:00 am	2016-01-14 @ 8:00 am	1.4 ± 0.5	2016-01-20
7718805	102C	2016-01-11 @ 11:00 am	2016-01-14 @ 8:00 am	1.0 ± 0.4	2016-01-20
7715154	103	2016-01-11 @ 9:00 am	2016-01-14 @ 8:00 am	0.9 ± 0.4	2016-01-20
7715155	103	2016-01-11 @ 9:00 am	2016-01-14 @ 8:00 am	0.8 ± 0.4	2016-01-20
7715191	104	2016-01-11 @ 10:00 am	2016-01-14 @ 9:00 am	0.8 ± 0.4	2016-01-20
7715144	106	2016-01-11 @ 9:00 am	2016-01-14 @ 8:00 am	1.0 ± 0.5	2016-01-20
7715158	107	2016-01-11 @ 9:00 am	2016-01-14 @ 8:00 am	1.1 ± 0.4	2016-01-20
7715146	108	2016-01-11 @ 9:00 am	2016-01-14 @ 8:00 am	1.1 ± 0.3	2016-01-18
7715147	108	2016-01-11 @ 9:00 am	2016-01-14 @ 8:00 am	1.5 ± 0.4	2016-01-18
7715145	108A	2016-01-11 @ 9:00 am	2016-01-14 @ 8:00 am	0.8 ± 0.4	2016-01-20
7715161	109	2016-01-11 @ 9:00 am	2016-01-14 @ 9:00 am	< 0.3	2016-01-20
7715165	111	2016-01-11 @ 9:00 am	2016-01-14 @ 9:00 am	0.8 ± 0.4	2016-01-20
7715181	115	2016-01-11 @ 10:00 am	2016-01-14 @ 9:00 am	< 0.3	2016-01-20
7715182	115	2016-01-11 @ 10:00 am	2016-01-14 @ 9:00 am	0.7 ± 0.4	2016-01-20
7715149	118	2016-01-11 @ 9:00 am	2016-01-14 @ 8:00 am	1.0 ± 0.5	2016-01-20
7715150	120	2016-01-11 @ 9:00 am	2016-01-14 @ 8:00 am	1.9 ± 0.5	2016-01-20
7715183	121	2016-01-11 @ 10:00 am	2016-01-14 @ 9:00 am	< 0.3	2016-01-20
7715184	121	2016-01-11 @ 10:00 am	2016-01-14 @ 9:00 am	< 0.3	2016-01-20
7715185	121A	2016-01-11 @ 10:00 am	2016-01-14 @ 9:00 am	0.7 ± 0.4	2016-01-20
7715180	123	2016-01-11 @ 10:00 am	2016-01-14 @ 9:00 am	< 0.3	2016-01-20
7715151	124	2016-01-11 @ 9:00 am	2016-01-14 @ 8:00 am	1.6 ± 0.5	2016-01-20
7715152	126	2016-01-11 @ 9:00 am	2016-01-14 @ 8:00 am	1.6 ± 0.4	2016-01-18
7715148	130	2016-01-11 @ 9:00 am	2016-01-14 @ 8:00 am	1.3 ± 0.5	2016-01-20
7715153	134	2016-01-11 @ 9:00 am	2016-01-14 @ 8:00 am	1.1 ± 0.4	2016-01-20
7715175	137	2016-01-11 @ 10:00 am	2016-01-14 @ 9:00 am	< 0.3	2016-01-18

February 1, 2016
**LABORATORY ANALYSIS
REPORT ****

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

Kit #	Room Id	Started	Ended	pCi/L	Analyzed
7715176	137	2016-01-11 @ 10:00 am	2016-01-14 @ 9:00 am	< 0.3	2016-01-20
7715177	137	2016-01-11 @ 10:00 am	2016-01-14 @ 9:00 am	< 0.3	2016-01-20
7715178	137	2016-01-11 @ 10:00 am	2016-01-14 @ 9:00 am	< 0.3	2016-01-20
7715179	137A	2016-01-11 @ 10:00 am	2016-01-14 @ 9:00 am	< 0.3	2016-01-20
7715156	138	2016-01-11 @ 9:00 am	2016-01-14 @ 8:00 am	0.7 ± 0.4	2016-01-20
7715157	138	2016-01-11 @ 9:00 am	2016-01-14 @ 8:00 am	< 0.3	2016-01-20
7715159	142	2016-01-11 @ 9:00 am	2016-01-14 @ 8:00 am	0.6 ± 0.4	2016-01-20
7715160	146	2016-01-11 @ 9:00 am	2016-01-14 @ 9:00 am	2.0 ± 0.5	2016-01-20
7715162	150	2016-01-11 @ 9:00 am	2016-01-14 @ 9:00 am	< 0.3	2016-01-20
7715163	152	2016-01-11 @ 9:00 am	2016-01-14 @ 9:00 am	0.6 ± 0.4	2016-01-20
7715164	156	2016-01-11 @ 9:00 am	2016-01-14 @ 9:00 am	0.7 ± 0.4	2016-01-20
7715166	164	2016-01-11 @ 9:00 am	2016-01-14 @ 9:00 am	< 0.3	2016-01-18
7715167	168	2016-01-11 @ 9:00 am	2016-01-14 @ 9:00 am	0.6 ± 0.3	2016-01-18
7715168	168A	2016-01-11 @ 9:00 am	2016-01-14 @ 9:00 am	0.5 ± 0.3	2016-01-18
7715169	172	2016-01-11 @ 9:00 am	2016-01-14 @ 9:00 am	< 0.3	2016-01-18
7715170	172	2016-01-11 @ 9:00 am	2016-01-14 @ 9:00 am	< 0.3	2016-01-18
7715192	174	2016-01-11 @ 10:00 am	2016-01-14 @ 9:00 am	1.2 ± 0.4	2016-01-20
7715186	178	2016-01-11 @ 10:00 am	2016-01-14 @ 9:00 am	1.2 ± 0.5	2016-01-20
7715187	178	2016-01-11 @ 10:00 am	2016-01-14 @ 9:00 am	1.0 ± 0.4	2016-01-20
7715188	178A	2016-01-11 @ 10:00 am	2016-01-14 @ 9:00 am	0.8 ± 0.4	2016-01-20
7715189	178A2	2016-01-11 @ 10:00 am	2016-01-14 @ 9:00 am	0.8 ± 0.4	2016-01-20
7715190	178B	2016-01-11 @ 10:00 am	2016-01-14 @ 9:00 am	0.8 ± 0.4	2016-01-20
7715171	180 A	2016-01-11 @ 10:00 am	2016-01-14 @ 9:00 am	< 0.3	2016-01-20
7715172	182	2016-01-11 @ 10:00 am	2016-01-14 @ 9:00 am	1.6 ± 0.4	2016-01-20
7715173	184	2016-01-11 @ 10:00 am	2016-01-14 @ 9:00 am	0.9 ± 0.4	2016-01-20
7715174	186	2016-01-11 @ 10:00 am	2016-01-14 @ 9:00 am	< 0.3	2016-01-20
7718807	209	2016-01-11 @ 11:00 am	2016-01-14 @ 9:00 am	0.9 ± 0.3	2016-01-18
7718808	209	2016-01-11 @ 11:00 am	2016-01-14 @ 9:00 am	0.8 ± 0.4	2016-01-20
7718806	232	2016-01-11 @ 11:00 am	2016-01-14 @ 9:00 am	0.8 ± 0.3	2016-01-18

February 1, 2016
**** LABORATORY ANALYSIS REPORT ****

Radon test result report for:
**CASHELL ELEMENTARY SCHOOL
PORTABLE**

Kit #	Room Id	Started	Ended	pCi/L	Analyzed
7718809	PORT. 1	2016-01-11 @ 11:00 am	2016-01-14 @ 9:00 am	< 0.3	2016-01-18
7718810	PORT. 1	2016-01-11 @ 11:00 am	2016-01-14 @ 9:00 am	< 0.3	2016-01-20

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

February 2, 2016
LABORATORY ANALYSIS REPORT

Radon test result report for:
MCPS PHASE 5 & 6 TRANSIT BLANKS

Kit #	Room Id	Started	Ended	pCi/L	Analyzed
7722194	1	2016-01-19 @ 12:00 pm	2016-01-22 @ 12:00 pm	< 0.3	2016-01-27
7718494	10	2016-01-19 @ 12:00 pm	2016-01-22 @ 12:00 pm	< 0.3	2016-01-27
7718475	11	2016-01-19 @ 12:00 pm	2016-01-22 @ 12:00 pm	< 0.3	2016-01-27
7718495	12	2016-01-19 @ 12:00 pm	2016-01-22 @ 12:00 pm	< 0.3	2016-01-27
7718496	13	2016-01-19 @ 12:00 pm	2016-01-22 @ 12:00 pm	< 0.3	2016-01-27
7718497	14	2016-01-19 @ 12:00 pm	2016-01-22 @ 12:00 pm	< 0.3	2016-01-27
7718498	15	2016-01-19 @ 12:00 pm	2016-01-22 @ 12:00 pm	< 0.3	2016-01-27
7718499	16	2016-01-19 @ 12:00 pm	2016-01-22 @ 12:00 pm	< 0.3	2016-01-27
7718500	17	2016-01-19 @ 12:00 pm	2016-01-22 @ 12:00 pm	< 0.3	2016-01-27
7718296	18	2016-01-19 @ 12:00 pm	2016-01-22 @ 12:00 pm	< 0.3	2016-01-27
7718295	19	2016-01-19 @ 12:00 pm	2016-01-22 @ 12:00 pm	< 0.3	2016-01-27
7722195	2	2016-01-19 @ 12:00 pm	2016-01-22 @ 12:00 pm	< 0.3	2016-01-27
7716789	20	2016-01-19 @ 12:00 pm	2016-01-22 @ 12:00 pm	< 0.3	2016-01-27
7716785	21	2016-01-19 @ 12:00 pm	2016-01-22 @ 12:00 pm	< 0.3	2016-01-26
7716791	22	2016-01-19 @ 12:00 pm	2016-01-22 @ 12:00 pm	< 0.3	2016-01-27
7716786	23	2016-01-19 @ 12:00 pm	2016-01-22 @ 12:00 pm	< 0.3	2016-01-27
7716793	24	2016-01-19 @ 12:00 pm	2016-01-22 @ 12:00 pm	< 0.3	2016-01-27
7718274	25	2016-01-19 @ 12:00 pm	2016-01-22 @ 12:00 pm	< 0.3	2016-01-27
7716792	26	2016-01-19 @ 12:00 pm	2016-01-22 @ 12:00 pm	< 0.3	2016-01-27
7718294	27	2016-01-19 @ 12:00 pm	2016-01-22 @ 12:00 pm	< 0.3	2016-01-27
7718293	28	2016-01-19 @ 12:00 pm	2016-01-22 @ 12:00 pm	< 0.3	2016-01-27
7718292	29	2016-01-19 @ 12:00 pm	2016-01-22 @ 12:00 pm	< 0.3	2016-01-27
7722197	3	2016-01-19 @ 12:00 pm	2016-01-22 @ 12:00 pm	< 0.3	2016-01-27
7718290	30	2016-01-19 @ 12:00 pm	2016-01-22 @ 12:00 pm	< 0.3	2016-01-27
7722198	4	2016-01-19 @ 12:00 pm	2016-01-22 @ 12:00 pm	< 0.3	2016-01-27
7722199	5	2016-01-19 @ 12:00 pm	2016-01-22 @ 12:00 pm	< 0.3	2016-01-27
7722211	6	2016-01-19 @ 12:00 pm	2016-01-22 @ 12:00 pm	< 0.3	2016-01-27
7718491	7	2016-01-19 @ 12:00 pm	2016-01-22 @ 12:00 pm	< 0.3	2016-01-27
7718476	8	2016-01-19 @ 12:00 pm	2016-01-22 @ 12:00 pm	< 0.3	2016-01-26
7718479	9	2016-01-19 @ 12:00 pm	2016-01-22 @ 12:00 pm	< 0.3	2016-01-27

December
23,
2015

**LABORATORY ANALYSIS
REPORT ****

Spike Sample Laboratory Results

Radon test result report for:
MCPS

Kit #	Room Id	Started	Ended	pCi/L	Analyzed
7706380	101	2015-12-18 @ 9:00 am	2015-12-21 @ 9:00 am	25.2	2015-12-23
7706381	102	2015-12-18 @ 9:00 am	2015-12-21 @ 9:00 am	26.5	2015-12-23
7706208	103	2015-12-18 @ 9:00 am	2015-12-21 @ 9:00 am	27.7	2015-12-23
7705132	104	2015-12-18 @ 9:00 am	2015-12-21 @ 9:00 am	28.6	2015-12-23
7706366	105	2015-12-18 @ 9:00 am	2015-12-21 @ 9:00 am	26.5	2015-12-23
7706211	106	2015-12-18 @ 9:00 am	2015-12-21 @ 9:00 am	26.1	2015-12-23

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

Note: Spike samples are test canisters that are deliberately exposed to a controlled high level of radon in a laboratory. They provide a quality control measure in the testing process and do NOT reflect radon levels in the building being tested.

EXPOSURE IN BOWSER-MORNER RADON CHAMBER

CLIENT KCI Technologies Inc. Job Number 173224

NOMINAL Conditions: Radon Conc 26.9 pCi/L Rel. Hum 49.6 % Temp. 69.9 F

Date Start: 12/18/15 Date Stop: 12/21/15 Date Start: _____ Date Stop: _____

Time Start: 0929 Time Stop: 0929 Time Start: _____ Time Stop: _____

Device No.'s: 7705132, 7706208, Device No.'s: _____

7706211, 7706366, _____

7706380, 7706381 _____

F3 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**



Chain of Custody

Project Name: MCPS Radon Phase V

Name of Schools:

- | | | |
|-------------------------|---------------------------|-------------------------|
| 1. Arcola ES | 11. Clopper Mill ES | 21. Parkland Magnet MS |
| 2. Argyle ES | 12. College Gardens ES | 22. Rachel Carson ES |
| 3. Bells Mill ES | 13. Eastern MS | 23. Roberto Clemente MS |
| 4. Bethesda ES | 14. Fallsmead ES | 24. Rock Creek ES |
| 5. Brookhaven ES | 15. Fields Road ES | 25. Rockview ES |
| 6. Burning Tree ES | 16. Flower Hill ES | 26. Rockville HS |
| 7. Capt. James Daly ES | 17. Flower Valley ES | 27. Rocky Hill MS |
| 8. Carderock Springs ES | 18. Fox Chapel ES | 28. Seneca Valley HS |
| 9. Cashell ES | 19. Glen Haven ES | 29. Westover ES |
| 10. Clearspring ES | 20. James Hubert Blake HS | 30. William Farquar MS |

	Date	Initials
Radon Test Kits Deployed	1/11/16	JM
Radon Test Kits Sampled	1/14/16	JM
Radon Test Kits Shipped to Lab*	1/15/16	JM
Radon Test Kits Received by Lab*	1/18/16	JM

*All samples sent to Air Check, Inc., 1936 Butler Bridge Road, Mills River, NC 28758

M. A. CECIL & ASSOCIATES, INC.

4475 Shannon Way, Port Republic, Maryland 20676 (301) 855-7710
INDUSTRIAL HYGIENE AND ENVIRONMENTAL HEALTH

October 12, 2015

Mr. Sean Yarup
Montgomery County Public Schools
16651 Crabbs Branch Way
Rockville, Maryland 20855

Re: Radon Evaluation- Cashell Elementary

Dear Mr. Yarup:

Environmental radon testing has been completed at Cashell Elementary.

Eighteen charcoal canisters were placed in various rooms throughout the school. The canisters were placed on September 11, 2015 and retrieved on September 14, 2015.

The detected radon concentration was below the EPA recommended level of 4.0 pico curries per liter (pCi/l) of air. Testing locations and results are summarized in the attached table.

Should you have any questions concerning this report please do not hesitate to contact us.

Sincerely,

Michael A. Cecil

Michael A. Cecil, CIH

**Cashell Elementary School
Environmental Radon Results
September 11 to September 14, 2015**

Location	Detected Radon Concentration (pCi/l)
Room 103	1.8
Room 107	2.0
Room 108	2.1
Room 120	2.9
Room 118	2.1
Room 124	2.1
Room 126	1.2
Room 130A	1.2
Room 130 B (QC duplicate)	0.9
Room 134	<0.5
Room 138	1.6
Room 142	1.4
Room 146	2.1
Room 156	0.9
Room 164	<0.5
Room 168A	0.7
Room 168B (QC duplicate)	1.3
Room 174	1.4
Gym	0.7
MPR	1.0
ICM	1.6
Main Office	0.9