

School Year: **24-25**

Facility:	Robert Frost Middle School		
Address:	9201 Scott Dr.		
	Rockville, MD 20850		
Reason for Testing:	Scheduled Re-Testing - <input checked="" type="checkbox"/> 2-year or <input type="checkbox"/> 5-year schedule <input type="checkbox"/> Clearance Testing (Post-Mitigation) <input type="checkbox"/> Building Envelope or HVAC Upgrades <input type="checkbox"/> New Construction – Addition or Facility		
Current Radon Status:	<input checked="" type="checkbox"/> Active Mitigation (2-year regular schedule) <input type="checkbox"/> No Active Mitigation (5-year regular schedule) <input type="checkbox"/> Not Previously Tested (New Facility)		
Round of Testing:	<input checked="" type="checkbox"/> Initial Testing <b>-or-</b> <input type="checkbox"/> Follow-up Testing		
Testing Status:	<input checked="" type="checkbox"/> No Further Testing Needed <b>-or-</b> <input type="checkbox"/> Follow-Up Testing Required		

**Conclusion** (When Testing Status is - No Further Testing Needed)

Mitigation -	Facility Radon Status:		
<input checked="" type="checkbox"/> Not Required <input type="checkbox"/> Required ( $\geq 4.0$ -pCi/L) Rooms:	<input checked="" type="checkbox"/> No Change in Status <input type="checkbox"/> Active Mitigation (2-year regular schedule) <input type="checkbox"/> No Active Mitigation (5-year regular schedule)		
Number of Rooms Tested	63	Lowest Value (pCi/L)	<0.3
Number of Rooms ( $\geq 4.0$ -pCi/L)	0	Highest Value (pCi/L)	1.6

**Instructions:** Submit one testing report form per-facility. Include the following as attachments:

Attachment 1- Summary Data Tables – containing the following: (see attached samples tables)

- Testing Results – lab/detector Identification, by room number/name (alpha-numeric order) as depicted on facility map/floor plan provided by the facility/school at the time of test device deployment;
- Summary Results – list of rooms by test result  $\geq 2.0$ -pCi/L;  $\geq 2.7$ -pCi/L;  $\geq 4.0$ -pCi/L; and  $\geq 8.0$ -pCi/L;
- QA/QC Results - (field blanks and duplicates) indicating location collected; trip and office blanks; and spike sample results;
- Invalid Measurement Locations – missed locations, missing and or damaged/compromised testing devices.

Attachment 2 – Laboratory Report(s)

Attachment 3 – Sampling Location Map(s) – indicating approximate location of samples, duplicates and blanks.

**Detector and Deployment**

Detector/Device Type:	<input checked="" type="checkbox"/> Passive	<input checked="" type="checkbox"/> Charcoal Absorption (CAD) <input type="checkbox"/> Alpha Track (ATD) <input type="checkbox"/> Other
	<input type="checkbox"/> Continuous	<input type="checkbox"/> Electret ion Chamber (EIC) <input type="checkbox"/> Electronic Integration (EID)
Other—Specify here:		
Detector/Device Name:	Air Chek – Radon Test Kits	
Manufacturer:	Radon Labs	
Person(s) Deploying or Retrieving Test Devices and certification number		Organization/Company
Brittany Maas		KCI Technologies, Inc.
<i>If noncertified individuals, the qualified measurement professional providing oversight -</i>		
Tyler McCleaf, CSP Cert. # 111004-RMP		KCI Technologies, Inc.

**Testing**

<input checked="" type="checkbox"/> Short-Term	Length of Test (days):	3	Date of Deployment and Retrieval (mm/dd/yy):	1/27/2025
<input type="checkbox"/> Long-Term				1/30/2025
Does the test period include weekends, school breaks or holidays?				<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No
<i>If "Yes" please explain/detail in the space below:</i>				
Was HVAC operating under occupied conditions?				<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No
<i>If "No" please explain/detail in the space below:</i>				

Testing (continued)

Round of Testing	Detectors Deployed				Total
	Ground-Contact		Upper-Level(s)		
	Initial	Follow-Up	Initial	Follow-Up	
Test Locations <sup>1</sup>	60	0	3	0	63
Duplicates <sup>2</sup>	7	0	0	0	7
Field Blanks <sup>3</sup>	3	0	0	0	3
Grand Total					73

1 – include all detectors deployed (duplicates, field blanks); 1 detector per occupied (or intended to be occupied) ground-contact space ≤ 2,000-square feet; large spaces ≥ 2,000-square feet - 1 detector per 2,000-square feet or part thereof); and upper floors - 10% of all occupied or intended to be occupied rooms per floor (these are in addition to ground contact locations)

2 - 10% of all locations tested, per floor

3 – 5% of all locations tested, per floor

Quality Assurance / Quality Control (QA/QC)

A Quality Assurance plan that is consistent with ANSI/AARST MS-QA (Radon Measurement Systems Quality Assurance) was submitted under separate cover, and is available to review at the MCPS Radon Testing and Mitigation Program website. The following number of QA/QC samples are associated this facility.

Round of Testing	QA/QC Samples		Total
	Initial	Follow-Up	
Spikes <sup>1</sup>	Not applicable		10
Trip Blanks <sup>2</sup>	1	0	1
Office Blanks <sup>3, 4</sup>	1	0	1
			12

1 - 3% of EIC detectors; and 3% from each LOT of CAD and ATD detectors; a maximum of 6-spiked measurements per month for both EIC detectors and each LOT of CAD and ATD detectors.

2 – One per shipping container from start of detector deployment

3 – One per facility tested as devices are removed/allocated from the storage location for deployment;

4 - One additional blank, analyzed prior to deployment, for storage locations that have not been evaluated or monitored, for detectors that have been stored for more than 30-day durations.

Quality Assurance / Quality Control (continued)

Spike Sample Lab Results. Measured values are satisfactory, i.e., within $\pm 25\%$ of the chamber's reference value?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	
Quality Control measurements comply with QA/QC requirements in the submitted testing organization's/company's QA plan?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	
	<b>Initial</b>	<b>Follow-Up</b>
All Field, Trip and Office Blanks are $\leq$ (less than or equal to) to the Method Detection Limit?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No
For all Duplicate Samples <sup>1</sup> , the higher value is $\leq 2x$ the lower value?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No
For all Duplicate Samples <sup>1</sup> , Relative Percent Difference(s) (RPD) <sup>2</sup> are less than the Warning Level <sup>3</sup> ?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No
For all Duplicate Samples <sup>1</sup> , Relative Percent Difference(s) (RPD) <sup>2</sup> are less than the Control Level <sup>3</sup> ?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No

1 – Duplicate Control – a “NO” response constitute a control failure and the space/location represented by the duplicate sample becomes an invalid measurement location and should be listed in the “Invalid Measurement Locations” Table attached to this report.

2 - The objective of duplicate tests is to assess the precision error of the measurement method or, how well two side-by-side measurements agree or disagree. Precision involving duplicates is calculated by using Relative Percent Difference (RPD). RPD is equal to the difference between the higher test result minus the lower value test result divided by the average of the two duplicate test results, multiplied by 100. The RPD result is then compared to the warning and control limits.

3 - The Warning Level is set at the deviation from ideal performance that would be expected to occur by chance only 5% of the time, and Control Limits are set at that deviation from ideal performance that would be expected to occur by chance only 1% of the time. The Warning Level indicates a potential problem, which should be investigated. The Control Level indicates that the measurement system should be subject to corrective action.

The control and warning levels for duplicates, based on the averaged duplicate test result, are -

Average concentration of the two duplicate test results	Warning Level	Control Level
< 2.0-pCi/L	1-pCi/L	Not applicable
Between 2.0 and 3.9-pCi/L	50% RPD	67% RPD
$\geq 4.0$ -pCi/L	28% RPD	36% RPD

Summary of Test Results<sup>1</sup> and Determination of Valid Measurements<sup>2</sup>

Round of Testing	Ground-Contact		Upper-Level(s)		Total
	Initial	Follow-Up	Initial	Follow-Up	
Number of test locations:	60	0	3	0	63
Number of locations $\geq 8.0$ -pCi/L:	0	0	0	0	0
Number of locations $\geq 4.0$ and $\leq 8$ -pCi/L:	0	0	0	0	0
Number of locations $\geq 2.7$ and $< 4$ -pCi/L:	0	0	0	0	0
Number of locations $\geq 2.0$ and $< 2.7$ -pCi/L:	0	0	0	0	0
Number of missing required test locations <sup>3</sup> :	4	0	0	0	4
Number of failed duplicate control locations:	0	0	0	0	0
Percentage of missing test locations for the facility <sup>4,5</sup> :	6.6%	0	0	0	6.6%

1 – for locations with multiple test results, report consistent with Section 7.2(When Two Test Results Disagree) and 8.1.2 (Averaging) of ANSI/AARST MA-MFLB 2023 – Conducting Measurements of Radon in Multifamily, School, Commercial and Mix-Use Buildings;

2 - the allowance is to be calculated individually for Ground-Contact and Upper-Level(s) Test Locations;

3 – includes missed or inaccessible locations upon deployment or retrieval, damaged (not able to analyze) and missing detectors upon retrieval;

4 – if all valid measurements are  $< 4.0$ -pCi/L and the total number of test locations are  $\geq 18$ , there is an allowance of  $\leq 33\%$ . If less than 18 test locations please review section 6.2 of the ANSI/AARST MA-MFLB 2023;

5 – if any valid measurements are  $\geq 4.0$ -pCi/L and the total number of test locations are  $\geq 20$ , there is an allowance of  $\leq 25\%$  of the total locations tested. If less than 20 test locations please review section 6.2 of the ANSI/AARST MA-MFLB 2023.

Summary of Test Results<sup>1</sup> and Determination of Valid Measurements<sup>2</sup> (continued)

	Round of Testing	Initial	Follow-Up
Were test devices deployed in all occupied and intended to be occupied rooms in contact with the ground, and, if applicable, 10% of upper floor rooms?		<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No
Were valid measurements obtained in all occupied and intended to be occupied rooms in contact with the ground, and, if applicable, 10% of upper floor rooms?		<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No
<i>If Yes to both above – then Testing Status – ‘No Further Testing Needed’ mark ‘NA’ below and complete Conclusions section</i>			
<b>If No to either above, were all results obtained under 4.0-pCi/L and were sufficient valid measurements obtained?<sup>1,2</sup></b> <i>If Yes, then - ‘No Further Testing Needed’ complete Conclusion section on first page. If No, then - ‘Follow-up Testing Required’ continue below.</i>		<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> NA	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> NA

1 – if all valid measurements are <4.0-pCi/L and the total number of test locations are ≥18, there is an allowance of ≤33%. If less than 18 test locations please review section 6.2 of the ANSI/AARST MA-MFLB 2023 – Conducting Measurements of Radon in Multifamily, School, Commercial and Mix-Use Buildings to determine the allowance;  
 2 – if any valid measurements are ≥4.0-pCi/L and the total number of test locations are ≥20, there is an allowance of ≤25% of the total locations tested. If less than 20 test locations please review section 6.2 of the ANSI/AARST MA-MFLB 2023 – Conducting Measurements of Radon in Multifamily, School, Commercial and Mix-Use Buildings to determine the number the allowance.

**Follow-Up Testing**

**Required –**

- If an insufficient number (greater than the allowance provided above) of valid measurements were obtained during the initial round of testing (the “missing required test locations” in the table above);
- Any location test results ≥ 4.0-pCi/L;
- Any location where duplicates fail QC checks; and or
- At the discretion of MCPS IAQ Staff

Reason for Follow-Up Testing	Testing Procedure	Follow-up Result	Conclusion
Insufficient Number of Measurements	Follow same procedures as Initial Testing	Not Applicable	Follow Initial Testing procedures
Results ≥ 4.0-pCi/L	Deploy two Short-term follow-up tests and required blanks and duplicates; Average the results of the two tests	≥4.0	Mitigation Required
Failed QC checks		≥2.0 and <4.0	Consider Mitigation
		<2.0	Mitigation Not Required

➤ ***If follow-up testing identifies additional spaces requiring additional testing it will be performed as part of the ongoing follow-testing round.***

**Attachment 1:**  
**Summary Data Tables**

<b>Table 1- Radon Testing Results</b>		
<b>Robert Frost Middle School</b>		
<b>Test Period: 1/27/2025 - 1/30/2025</b>		
Kit Number	Room / Area	Result
11951526	101	< 0.3
11951527	101	< 0.3
11951518	102	0.7
11951512	103	0.7
11951524	104	< 0.3
11951511	105	0.7
11951507	106	< 0.3
11951515	107	1.6
11951505	109	< 0.3
11951542	110	< 0.3
11951514	111	0.5
11951513	111	< 0.3
11951517	111	< 0.3
11951525	112	< 0.3
11951533	113	< 0.3
11951535	114	< 0.3
11951506	115	< 0.3
11951528	150	< 0.3
11951536	150	< 0.3
11951529	151	< 0.3
11951530	152	< 0.3
11951541	153	< 0.3
11951543	154	< 0.3
11951567	155	< 0.3
11951540	156	< 0.3
11951531	217	< 0.3
11951555	218	< 0.3
11951522	219	< 0.3
11951546	220	< 0.3
11951559	230	< 0.3
11951521	231	< 0.3
11951566	232	< 0.3
11951501	233	< 0.3
11951502	240	< 0.3
11951564	240	< 0.3
11951571	240	< 0.3
11951572	240	< 0.3

<b>Table 1- Radon Testing Results</b>		
<b>Robert Frost Middle School</b>		
<b>Test Period: 1/27/2025 - 1/30/2025</b>		
Kit Number	Room / Area	Result
11951573	240	< 0.3
11951557	250	< 0.3
11951548	256	< 0.3
11951556	257	< 0.3
11951544	258	< 0.3
11951550	259	0.8
11951551	259	1.0
11951549	260	< 0.3
11951519	100A	< 0.3
11951523	101 OFFICE	< 0.3
11951539	155B	< 0.3
11951582	200A	< 0.3
11951532	206F	< 0.3
11951538	220A	< 0.3
11951545	220A	< 0.3
11951552	220A	< 0.3
11951537	220B	< 0.3
11951568	249A	0.7
11951576	249A	1.2
11951569	ASSISTANT PRINCIPAL	< 0.3
11951558	AUX GYM	0.9
11951560	AUX GYM	< 0.3
11951565	BOYS LOCKER ROOM OFFICE	< 0.3
11951561	CAFETERIA	< 0.3
11951562	CAFETERIA	< 0.3
11951510	CONFERENCE	< 0.3
11951547	GIRLS PE OFFICE	< 0.3
11951574	GIRLS PE OFFICE	< 0.3
11951534	KILN ROOM	< 0.3
11951563	KITCHEN OFFICE	0.6
11951508	LAB OFFICE D	< 0.3
11951503	MAIN OFFICE	< 0.3
11951575	PRINCIPAL	< 0.3
11951509	PROJECT PREP #2	< 0.3
11951554	STAFF DINING	< 0.3
11951504	WORK ROOM	< 0.3



<b>Table 3 - QC Radon Testing Results</b>			
<b>Robert Frost Middle School</b>			
<b>Test Period: 1/27/2025 - 1/30/2025</b>			
<b>Kit Number</b>	<b>QC Type</b>	<b>Room / Area</b>	<b>Result</b>
11951527	D	101	< 0.3
11951513	D	111	< 0.3
11951517	FB	111	< 0.3
11951528	D	150	< 0.3
11951538	D	220A	< 0.3
11951545	FB	220A	< 0.3
11951550	D	259	0.8
11951573	D	240	< 0.3
11951547	FB	Girls PE Office	< 0.3
11951568	D	249A	0.7
11906885	OB	OFFICE BLANK	< 0.3
11906899	TB	TRAVEL BLANK	< 0.3

Table 3a - Duplicate Worksheet / Data Validation

Robert Frost Middle School

Test Period: 01/27/2025 - 01/30/2025

Sample ID			Duplicate Concentrations (pCi/L) and OC Checks							
Kit Numbers		Room / Area	Higher	Lower	Check #1 (Pass/Fail)	2x the Lower	Check #2 (Pass/Fail)	Average	Relative Percent Difference (RPD)	Check #3
11951526	11951527	101	0.3	0.3	✓	0.6	PASS	0.3	<1-pCi/L	✓
11951514	11951513	111	0.5	0.3	✓	0.6	PASS	0.4	<1-pCi/L	✓
11951536	11951528	150	0.3	0.3	✓	0.6	PASS	0.3	<1-pCi/L	✓
11951552	11951538	220A	0.3	0.3	✓	0.6	PASS	0.3	<1-pCi/L	✓
11951551	11951550	259	1.0	0.8	✓	1.6	PASS	0.9	<1-pCi/L	✓
11951564	11951573	240	0.3	0.3	✓	0.6	PASS	0.3	<1-pCi/L	✓
11951576	11951568	249A	1.2	0.7	✓	1.4	PASS	1.0	<1-pCi/L	✓

**NOTES:**

QC Check #1 - Data Entry

QC Check #2 - Higher duplicate concentration is < or = to 2x the Lower

QC Check #3 - Meets RPD Limits, by average duplicate concentration

- enter 2 if RPD is BELOW warning and control levels, AND passes QC Check 1 and 2
- enter 1 if RPD is ABOVE warning and BELOW control levels, AND passes QC Check 1 and 2
- enter 0 if RPD is ABOVE control level, or 'FAILS' QC Check 1 or 2

Average (pCi/L)	Warning Level	Control Level
< 2.0	1-pCi/L	NA
Between 2.0 and 3.9	50% RPD	67% RPD
≥ 4.0	28% RPD	36% RPD



**Attachment 2:**  
**Laboratory Reports**

Radon test result report for:  
**ROBERT FROST MS**  
**MAIN**

Kit #	Room Id	Started	Ended	pCi/L	Analyzed
11951519	100A	2025-01-27 @ 8:00 am	2025-01-30 @ 2:00 pm	< 0.3	2025-02-04
11951527	101	2025-01-27 @ 8:00 am	2025-01-30 @ 2:00 pm	< 0.3	2025-02-04
11951526	101	2025-01-27 @ 8:00 am	2025-01-30 @ 2:00 pm	< 0.3	2025-02-04
11951523	101 OFFICE	2025-01-27 @ 8:00 am	2025-01-30 @ 2:00 pm	< 0.3	2025-02-04
11951518	102	2025-01-27 @ 8:00 am	2025-01-30 @ 2:00 pm	0.7 ± 0.4	2025-02-04
11951512	103	2025-01-27 @ 8:00 am	2025-01-30 @ 2:00 pm	0.7 ± 0.4	2025-02-04
11951524	104	2025-01-27 @ 8:00 am	2025-01-30 @ 2:00 pm	< 0.3	2025-02-04
11951511	105	2025-01-27 @ 8:00 am	2025-01-30 @ 2:00 pm	0.7 ± 0.4	2025-02-04
11951507	106	2025-01-27 @ 8:00 am	2025-01-30 @ 2:00 pm	< 0.3	2025-02-04
11951515	107	2025-01-27 @ 8:00 am	2025-01-30 @ 2:00 pm	1.6 ± 0.4	2025-02-04
11951505	109	2025-01-27 @ 8:00 am	2025-01-30 @ 2:00 pm	< 0.3	2025-02-04
11951542	110	2025-01-27 @ 8:00 am	2025-01-30 @ 2:00 pm	< 0.3	2025-02-04
11951514	111	2025-01-27 @ 8:00 am	2025-01-30 @ 2:00 pm	0.5 ± 0.4	2025-02-04
11951513	111	2025-01-27 @ 8:00 am	2025-01-30 @ 2:00 pm	< 0.3	2025-02-04
11951517	111	2025-01-27 @ 8:00 am	2025-01-30 @ 2:00 pm	< 0.3	2025-02-04
11951525	112	2025-01-27 @ 8:00 am	2025-01-30 @ 2:00 pm	< 0.3	2025-02-04
11951533	113	2025-01-27 @ 8:00 am	2025-01-30 @ 2:00 pm	< 0.3	2025-02-04
11951535	114	2025-01-27 @ 9:00 am	2025-01-30 @ 2:00 pm	< 0.3	2025-02-04
11951506	115	2025-01-27 @ 8:00 am	2025-01-30 @ 2:00 pm	< 0.3	2025-02-04
11951536	150	2025-01-27 @ 9:00 am	2025-01-30 @ 2:00 pm	< 0.3	2025-02-04
11951528	150	2025-01-27 @ 9:00 am	2025-01-30 @ 2:00 pm	< 0.3	2025-02-04
11951529	151	2025-01-27 @ 9:00 am	2025-01-30 @ 2:00 pm	< 0.3	2025-02-04
11951530	152	2025-01-27 @ 9:00 am	2025-01-30 @ 2:00 pm	< 0.3	2025-02-04
11951541	153	2025-01-27 @ 9:00 am	2025-01-30 @ 2:00 pm	< 0.3	2025-02-04
11951543	154	2025-01-27 @ 9:00 am	2025-01-30 @ 2:00 pm	< 0.3	2025-02-04
11951567	155	2025-01-27 @ 10:00 am	2025-01-30 @ 2:00 pm	< 0.3	2025-02-04
11951539	155B	2025-01-27 @ 9:00 am	2025-01-30 @ 2:00 pm	< 0.3	2025-02-04
11951540	156	2025-01-27 @ 9:00 am	2025-01-30 @ 2:00 pm	< 0.3	2025-02-04
11951582	200A	2025-01-27 @ 10:00 am	2025-01-30 @ 2:00 pm	< 0.3	2025-02-04
11951532	206F	2025-01-27 @ 9:00 am	2025-01-30 @ 2:00 pm	< 0.3	2025-02-04
11951531	217	2025-01-27 @ 9:00 am	2025-01-30 @ 2:00 pm	< 0.3	2025-02-04
11951555	218	2025-01-27 @ 9:00 am	2025-01-30 @ 2:00 pm	< 0.3	2025-02-04
11951522	219	2025-01-27 @ 9:00 am	2025-01-30 @ 2:00 pm	< 0.3	2025-02-04
11951546	220	2025-01-27 @ 9:00 am	2025-01-30 @ 2:00 pm	< 0.3	2025-02-04
11951552	220A	2025-01-27 @ 9:00 am	2025-01-30 @ 2:00 pm	< 0.3	2025-02-04
11951545	220A	2025-01-27 @ 9:00 am	2025-01-30 @ 2:00 pm	< 0.3	2025-02-04
11951538	220A	2025-01-27 @ 9:00 am	2025-01-30 @ 2:00 pm	< 0.3	2025-02-04

Radon test result report for:  
**ROBERT FROST MS**  
**MAIN**

Kit #	Room Id	Started	Ended	pCi/L	Analyzed
11951537	220B	2025-01-27 @ 9:00 am	2025-01-30 @ 2:00 pm	< 0.3	2025-02-04
11951559	230	2025-01-27 @ 9:00 am	2025-01-30 @ 2:00 pm	< 0.3	2025-02-04
11951521	231	2025-01-27 @ 9:00 am	2025-01-30 @ 2:00 pm	< 0.3	2025-02-04
11951566	232	2025-01-27 @ 9:00 am	2025-01-30 @ 2:00 pm	< 0.3	2025-02-04
11951501	233	2025-01-27 @ 9:00 am	2025-01-30 @ 2:00 pm	< 0.3	2025-02-04
11951564	240	2025-01-27 @ 10:00 am	2025-01-30 @ 2:00 pm	< 0.3	2025-02-04
11951572	240	2025-01-27 @ 10:00 am	2025-01-30 @ 2:00 pm	< 0.3	2025-02-04
11951571	240	2025-01-27 @ 10:00 am	2025-01-30 @ 2:00 pm	< 0.3	2025-02-04
11951573	240	2025-01-27 @ 10:00 am	2025-01-30 @ 2:00 pm	< 0.3	2025-02-04
11951502	240	2025-01-27 @ 10:00 am	2025-01-30 @ 2:00 pm	< 0.3	2025-02-04
11951568	249A	2025-01-27 @ 10:00 am	2025-01-30 @ 2:00 pm	0.7 ± 0.4	2025-02-04
11951576	249A	2025-01-27 @ 10:00 am	2025-01-30 @ 2:00 pm	1.2 ± 0.4	2025-02-04
11951557	250	2025-01-27 @ 9:00 am	2025-01-30 @ 2:00 pm	< 0.3	2025-02-04
11951548	256	2025-01-27 @ 9:00 am	2025-01-30 @ 2:00 pm	< 0.3	2025-02-04
11951556	257	2025-01-27 @ 9:00 am	2025-01-30 @ 2:00 pm	< 0.3	2025-02-04
11951544	258	2025-01-27 @ 9:00 am	2025-01-30 @ 2:00 pm	< 0.3	2025-02-04
11951551	259	2025-01-27 @ 9:00 am	2025-01-30 @ 2:00 pm	1.0 ± 0.4	2025-02-04
11951550	259	2025-01-27 @ 9:00 am	2025-01-30 @ 2:00 pm	0.8 ± 0.4	2025-02-04
11951549	260	2025-01-27 @ 9:00 am	2025-01-30 @ 2:00 pm	< 0.3	2025-02-04
11951569	ASSISTANT PRINCIPAL	2025-01-27 @ 10:00 am	2025-01-30 @ 2:00 pm	< 0.3	2025-02-04
11951558	AUX GYM	2025-01-27 @ 10:00 am	2025-01-30 @ 2:00 pm	0.9 ± 0.4	2025-02-04
11951560	AUX GYM	2025-01-27 @ 10:00 am	2025-01-30 @ 2:00 pm	< 0.3	2025-02-04
11951565	BOYS LOCKER ROOM OFFICE	2025-01-27 @ 10:00 am	2025-01-30 @ 2:00 pm	< 0.3	2025-02-04
11951561	CAFETERIA	2025-01-27 @ 10:00 am	2025-01-30 @ 2:00 pm	< 0.3	2025-02-04
11951562	CAFETERIA	2025-01-27 @ 10:00 am	2025-01-30 @ 2:00 pm	< 0.3	2025-02-04
11951510	CONFERENCE	2025-01-27 @ 8:00 am	2025-01-30 @ 2:00 pm	< 0.3	2025-02-04
11951574	GIRLS PE OFFICE	2025-01-27 @ 10:00 am	2025-01-30 @ 2:00 pm	< 0.3	2025-02-04
11951547	GIRLS PE OFFICE	2025-01-27 @ 10:00 am	2025-01-30 @ 2:00 pm	< 0.3	2025-02-04
11951534	KILN ROOM	2025-01-27 @ 8:00 am	2025-01-30 @ 2:00 pm	< 0.3	2025-02-04
11951563	KITCHEN OFFICE	2025-01-27 @ 10:00 am	2025-01-30 @ 2:00 pm	0.6 ± 0.4	2025-02-04
11951508	LAB OFFICE D	2025-01-27 @ 8:00 am	2025-01-30 @ 2:00 pm	< 0.3	2025-02-04
11951503	MAIN OFFICE	2025-01-27 @ 8:00 am	2025-01-30 @ 2:00 pm	< 0.3	2025-02-04
11951575	PRINCIPAL	2025-01-27 @ 10:00 am	2025-01-30 @ 2:00 pm	< 0.3	2025-02-04
11951509	PROJECT PREP #2	2025-01-27 @ 8:00 am	2025-01-30 @ 2:00 pm	< 0.3	2025-02-04
11951554	STAFF DINING	2025-01-27 @ 10:00 am	2025-01-30 @ 2:00 pm	< 0.3	2025-02-04
11951504	WORK ROOM	2025-01-27 @ 8:00 am	2025-01-30 @ 2:00 pm	< 0.3	2025-02-04

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February 4, 2025

**\*\* LABORATORY ANALYSIS REPORT \*\***

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Radon test result report for:

**OFFICE  
MAIN**

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<b>Kit #</b>	<b>Room Id</b>	<b>Started</b>	<b>Ended</b>	<b>pCi/L</b>	<b>Analyzed</b>
11906885	O	2025-01-27 @ 11:00 am	2025-01-30 @ 11:00 am	< 0.3	2025-02-04
11906899	O	2025-01-28 @ 11:00 am	2025-01-31 @ 11:00 am	< 0.3	2025-02-04

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

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February 4, 2025

**\*\* LABORATORY ANALYSIS REPORT \*\***

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Radon test result report for:

**TRAVEL  
MAIN**

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<b>Kit #</b>	<b>Room Id</b>	<b>Started</b>	<b>Ended</b>	<b>pCi/L</b>	<b>Analyzed</b>
11906900	T	2025-01-27 @ 11:00 am	2025-01-30 @ 11:00 am	< 0.3	2025-02-04
11926699	T	2025-01-28 @ 11:00 am	2025-01-31 @ 11:00 am	< 0.3	2025-02-04

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

# EXPOSURE IN BOWSER-MORNER RADON CHAMBER

CLIENT KCI TECHNOLOGIES, INC Job Number 20001560

NOMINAL Conditions: Radon Conc 50.6 pCi/L Rel. Hum 50.6% Temp. 70.8 F

Date Start: 12/14/24 Date Stop: 12/17/24 Date Start: \_\_\_\_\_ Date Stop: \_\_\_\_\_

Time Start: 0815 Time Stop: 0815 Time Start: \_\_\_\_\_ Time Stop: \_\_\_\_\_

Device No.'s: (3) CHAR BAGS Device No.'s: \_\_\_\_\_

11477880, 11477883, 11477896

B4 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  $\mu$ R/h Elevation = 820 ft**

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December 23, 2024

**\*\* LABORATORY ANALYSIS REPORT \*\***

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Radon test result report for:

**SK  
MAIN**

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<b>Kit #</b>	<b>Room Id</b>	<b>Started</b>	<b>Ended</b>	<b>pCi/L</b>	<b>Analyzed</b>
11477880	SK1	2024-12-14 @ 8:00 am	2024-12-17 @ 8:00 am	52.0 ± 4.2	2024-12-23
11477883	SK2	2024-12-14 @ 8:00 am	2024-12-17 @ 8:00 am	54.6 ± 4.4	2024-12-23
11477896	SK3	2024-12-14 @ 8:00 am	2024-12-17 @ 8:00 am	45.5 ± 3.6	2024-12-23

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

# EXPOSURE IN BOWSER-MORNER RADON CHAMBER

CLIENT KCI TECHNOLOGIES, INC Job Number 20002919

NOMINAL Conditions: Radon Conc 7.0 pCi/L Rel. Hum 51.4 % Temp. 70.7 F

Date Start: 3/7/25 Date Stop: 3/10/25 Date Start: \_\_\_\_\_ Date Stop: \_\_\_\_\_

Time Start: 0832 Time Stop: 0832 Time Start: \_\_\_\_\_ Time Stop: \_\_\_\_\_

Device No.'s: (7) CHAR BAGS Device No.'s: \_\_\_\_\_

11886401 thru 11886406,

11886410

G3 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  $\mu$ R/h Elevation = 820 ft**

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March 19, 2025

**\*\* LABORATORY ANALYSIS REPORT \*\***

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Radon test result report for:

**QC  
MAIN**

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<b>Kit #</b>	<b>Room Id</b>	<b>Started</b>	<b>Ended</b>	<b>pCi/L</b>	<b>Analyzed</b>
11886401	SK1	2025-03-07 @ 9:00 am	2025-03-10 @ 9:00 am	7.8 ± 1.1	2025-03-19
11886405	SK2	2025-03-07 @ 9:00 am	2025-03-10 @ 9:00 am	7.1 ± 1.1	2025-03-19
11886406	SK3	2025-03-07 @ 9:00 am	2025-03-10 @ 9:00 am	7.7 ± 1.1	2025-03-19
11886403	SK4	2025-03-07 @ 9:00 am	2025-03-10 @ 9:00 am	7.9 ± 1.2	2025-03-19
11886404	SK5	2025-03-07 @ 9:00 am	2025-03-10 @ 9:00 am	7.6 ± 1.2	2025-03-19
11886410	SK6	2025-03-07 @ 9:00 am	2025-03-10 @ 9:00 am	7.0 ± 1.1	2025-03-19
11886402	SK7	2025-03-07 @ 9:00 am	2025-03-10 @ 9:00 am	8.6 ± 1.2	2025-03-19

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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 – Testing January 27<sup>th</sup> – January 30<sup>th</sup>, 2024

Name of Schools:

1. Robert Frost MS
2. Walter Johnson HS
3. North Chevy Chase ES
4. Somerset ES

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	Date	Initials
Radon Test Kits Deployed	01/27/2025	DM
Radon Test Kits Collected	01/30/2025	DM
Radon Test Kits Shipped to Lab*	01/31/2025	DM
Radon Test Kits Received by Lab*	02/03/2025	DM

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



**MCPS RADON TESTING – EXECUTIVE SUMMARY**

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

Project Status:

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



February 21, 2022

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

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

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

Dear Mr. Croyle:

KCI Technologies, Inc. (KCI) is pleased to submit the following report to Montgomery County Public Schools (MCPS) pursuant to completing a “short-term” 3 day radon test for the Robert Frost Middle School, located at 9201 Scott Dr. Rockville, MD 20850 (subject site).

**Scope of Services:**

KCI conducted radon testing at the subject site to evaluate indoor radon levels relative to the USEPA's recommended action level of 4.0 picocuries per Liter (pCi/L) - the level at which EPA recommends that schools take action to reduce the level. KCI conducted the radon testing in accordance with American Association of Radon Scientists and Technologists (AARST) *Protocol for Conducting Measurements of Radon and Radon Decay Products in Schools and Large Buildings*. A National Radon Proficiency Program (NRPP) Radon Measurement Specialist (certification #111004 RT) supervised the testing. Additional information on radon management and the health effects of radon exposure is available from <https://www.montgomeryschoolsmd.org> or [www.epa.gov/radon](http://www.epa.gov/radon).

KCI visited the site on January 19, 2022 and deployed seventy seven (77) activated charcoal (AC) radon test kits. KCI deployed radon test kits in all frequently-occupied ground contact rooms, and other areas, (if applicable) in accordance with AARST guidance.

A floor plan map of the building with the test locations is included as Attachment A of this report.

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

KCI returned to the site on January 22, 2022 to retrieve the radon sampling test kits. KCI shipped all radon tests via overnight delivery to Airchek, Inc. for analysis by gamma-ray spectroscopy. Airchek, Inc.

is a NRSB certified analytical laboratory for radon analysis (certification # ARL1402) located at 1936 Butler Bridge Road, Mills River, North Carolina.

**Evaluation of Testing Conditions:**

These tests represent:

- Follow-up to post-mitigation biennial testing.

These tests were conducted to:

- Confirm the success of the mitigation system(s).

According to AARST, *Protocol for Conducting Measurements of Radon and Radon Decay Products in Schools and Large Buildings*, ideal testing conditions would be when the building is fully occupied and the heating system is active. For this test, the facility's HVAC system was operating in heating mode; therefore, KCI concludes that this test was conducted during ideal testing conditions.

KCI recorded observations of the following conditions in each room during the time of deployment and collection of the radon test kits:

- Indoor temperature,
- HVAC Operation,
- Dehumidifier operation,
- Humidifier operation,
- Ceiling fan operation, and
- Open windows or doors.

KCI also compiled weather data for the testing period and conducted observations of relevant field conditions. During the test period, weather records indicate low temperatures were in the 50s and high temperatures ranged from the mid 40s to the low 60s Fahrenheit. Maximum sustained winds ranged from 7-15 miles per hour. Average humidity was around 50% with .15 inches of precipitation (rain) was recorded during testing period.

**Results:**

The sampling locations and analytical results are listed on Table 1 (Attachment B). The quality control sample locations and analytical results are listed on Table 2 (Attachment B). Sampling locations and associated test kit identification numbers and relevant field observations are listed on Table 3 (Attachment B). The laboratory analytical results are included in Attachment C. Laboratory results and exposure data for the spike samples are also included in Attachment C.

The results of the radon test analysis indicated the following:

Radon Concentration	Room	Result
≥4.0 pCi/L	None	N/A
<4.0 pCi/L	See Attachment B	

Quality Control Samples	
Results of Blank Canisters:	The office blanks, and lab transit blanks had test results of less than the laboratory detection limit of 0.3 pCi/L.
Adequate Laboratory Precision?	Review of the duplicate sample analysis indicates that adequate laboratory measurement precision was achieved.
Spike Sample Analysis:	The Spike Sample analysis results indicate the laboratory is operating within statistical control limits.

Our professional services have been performed in accordance with customary principles and practices in the field of industrial hygiene and engineering. If you have any questions or comments regarding this report, please feel free to contact me at (410) 891-1769.

Sincerely,



Tyler P. McCleaf  
Radon Measurement Provider  
#111004 RT  
KCI Technologies, Inc.

Attachments:     A- Floor Plan with Test Locations  
                      B- Table 1-3, Radon Test Summary Spreadsheets  
                      C- Laboratory Analytical Results

# ATTACHMENT A

## Floor Plan With Test Locations

# ATTACHMENT B

## Radon Test Summary Spreadsheet

**Table Notes:**

AC- Activated Charcoal

ACI- Air Check, Inc.

D- Duplicate

FB- Field Blank

KCI- KCI Technologies, Inc.

OB- Office Blank

PM- Project Manager

OC- Quality Control

Table 1- Radon Testing Results		
Robert Frost MS		
Test Period: 01/25/2022-01/28/2022		
Kit Number	Room / Area	Result
11106232	101	< 0.3
11105950	102	< 0.3
11105916	103	< 0.3
11105941	104	0.8
11105908	105	0.5
11105933	106	0.7
11105905	107	0.7
11106237	108	< 0.3
11106238	109	< 0.3
11106230	110	< 0.3
11105914	111	0.8
11105921	112	< 0.3
11105929	113	0.7
11105906	114	< 0.3
11105919	115	< 0.3
11106222	150	< 0.3
11106219	151	< 0.3
11106221	152	< 0.3
11106227	153	< 0.3
11106220	154	< 0.3
11106228	155	< 0.3
11106226	156	< 0.3
11105943	201	< 0.3
11105928	230	< 0.3
11105927	231	< 0.3
11105956	257	< 0.3
11105934	258	< 0.3
11105935	258	< 0.3
11105911	259	< 0.3
11105937	100 PROJECT PREP #1	< 0.3
11105938	100A	< 0.3
11105949	103A	< 0.3
11105962	106A	< 0.3
11106233	109C	0.5
11105936	109D	< 0.3
11105913	110A	< 0.3
11106224	110C	< 0.3
11106231	110C	< 0.3
11106229	114A	0.8
11106225	155B	< 0.3
11105969	200A	< 0.3
11105970	200B WORKROOM	< 0.3

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

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



# ATTACHMENT C

## Laboratory Analytical Results

Radon test result report for:

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

Radon test result report for:

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

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February 1, 2022

**\*\* LABORATORY ANALYSIS REPORT \*\***

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Radon test result report for:

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

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

**EXPOSURE IN BOWSER-MORNER RADON CHAMBER**

CLIENT KCI Technologies, Inc. Job Number 203404

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

Date Start: 12/24/21 Date Stop: 12/27/21 Date Start: \_\_\_\_\_ Date Stop: \_\_\_\_\_

Time Start: 0809 Time Stop: 0809 Time Start: \_\_\_\_\_ Time Stop: \_\_\_\_\_

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

9341721, 9341722

64 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  $\mu$ R/h Elevation = 820 ft**

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December 31, 2021

**\*\* LABORATORY ANALYSIS REPORT \*\***

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Radon test result report for:

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

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

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



### Radon Test Kit Chain of Custody

Project Name: MCPS Radon – January 2022 Schools

Name of Schools:

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

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

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



**MCPS RADON TESTING – EXECUTIVE SUMMARY**

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

**Project Status**

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



May 12, 2022

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

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

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

Dear Mr. Croyle:

KCI Technologies, Inc. (KCI) is pleased to submit the following report to Montgomery County Public Schools (MCPS) pursuant to completing a “short-term” 3 day radon test for the Robert Frost Middle School, located at 9201 Scott Dr. Rockville, MD 20850 (subject site).

**Scope of Services:**

KCI conducted radon testing at the subject site to evaluate indoor radon levels relative to the USEPA's recommended action level of 4.0 picocuries per Liter (pCi/L) - the level at which EPA recommends that schools take action to reduce the level. KCI conducted the radon testing in accordance with American Association of Radon Scientists and Technologists (AARST) *Protocol for Conducting Measurements of Radon and Radon Decay Products in Schools and Large Buildings*. A National Radon Proficiency Program (NRPP) Radon Measurement Specialist (certification #111004 RT) supervised the testing. Additional information on radon management and the health effects of radon exposure is available from <https://www.montgomeryschoolsmd.org> or [www.epa.gov/radon](http://www.epa.gov/radon).

KCI visited the site on March 21, 2022 and deployed three (3) activated charcoal (AC) radon test kits. KCI deployed radon test kits in all frequently-occupied ground contact rooms, and other areas, (if applicable) in accordance with AARST guidance.

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

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

A floor plan map of the building with the test locations is included as Attachment A of this report.

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

KCI returned to the site on March 24, 2022 to retrieve the radon sampling test kits. KCI shipped all radon tests via overnight delivery to Airchek, Inc. for analysis by gamma-ray spectroscopy. Airchek, Inc. is a NRSB certified analytical laboratory for radon analysis (certification # ARL1402) located at 1936 Butler Bridge Road, Mills River, North Carolina.

### **Evaluation of Testing Conditions:**

These tests represent:

- Follow-up to initial testing.

These tests were conducted to:

- Evaluate radon concentrations at the facility.

According to AARST, *Protocol for Conducting Measurements of Radon and Radon Decay Products in Schools and Large Buildings*, ideal testing conditions would be when the building is fully occupied and the heating system is active. For this test, the facility's HVAC system was operating in heating mode; therefore, KCI concludes that this test was conducted during ideal testing conditions.

KCI recorded observations of the following conditions in each room during the time of deployment and collection of the radon test kits:

- Indoor temperature,
- HVAC Operation,
- Dehumidifier operation,
- Humidifier operation,
- Ceiling fan operation, and
- Open windows or doors.

KCI also compiled weather data for the testing period and conducted observations of relevant field conditions. During the test period, weather records indicate low temperatures were in the low 40°Fs and high temperatures ranged from the low 50°Fs to the low 70°Fs. Maximum sustained winds ranged from 0-29 miles per hour. Average humidity was around 56% with 0.51 inches of precipitation (rain) was recorded during testing period.

### **Results:**

The sampling locations and analytical results are listed on Table 1 (Attachment B). The quality control sample locations and analytical results are listed on Table 2 (Attachment B). Sampling locations and associated test kit identification numbers and relevant field observations are listed on Table 3 (Attachment B). The laboratory analytical results are included in Attachment C. Laboratory results and exposure data for the spike samples are also included in Attachment C.

The results of the radon test analysis indicated the following:

Radon Concentration	Room	Result
≥4.0 pCi/L	None	N/A
<4.0 pCi/L	See Attachment B	

Quality Control Samples	
Results of Blank Canisters:	The office blanks, and lab transit blanks had test results of less than the laboratory detection limit of 0.3 pCi/L.
Adequate Laboratory Precision?	Review of the duplicate sample analysis indicates that adequate laboratory measurement precision was achieved.
Spike Sample Analysis:	The Spike Sample analysis results indicate the laboratory is operating within statistical control limits.

Our professional services have been performed in accordance with customary principles and practices in the field of industrial hygiene and engineering. If you have any questions or comments regarding this report, please feel free to contact me at (410) 891-1769.

Sincerely,



Tyler P. McCleaf  
Radon Measurement Provider  
#111004 RT  
KCI Technologies, Inc.

Attachments:   A- Floor Plan with Test Locations  
                  B- Table 1-3, Radon Test Summary Spreadsheets  
                  C- Laboratory Analytical Results

# ATTACHMENT A

## Floor Plan With Test Locations

# ATTACHMENT B

## Radon Test Summary Spreadsheet

**Table Notes:**

AC- Activated Charcoal

ACI- Air Check, Inc.

D- Duplicate

FB- Field Blank

KCI- KCI Technologies, Inc.

OB- Office Blank

PM- Project Manager

OC- Quality Control

Table 1- Radon Testing Results		
Robert Frost MS RT		
Test Period: 03/21/2022 - 03/24/2022		
Kit Number	Room / Area	Result
11139237	249C	< 0.3
11139244	249C	< 0.3
11139268	249C	0.5

Table 2- Radon Testing Results			
Robert Frost MS RT			
Test Period: 03/21/2022 - 03/24/2022			
Kit Number	QC Type	Room / Area	Result
11139237	D	249C	< 0.3
11139244	FB	249C	< 0.3
11139902	OB	OFFICE BLANK	< 0.3
11139928	TB	TRAVEL BLANK	< 0.3



# ATTACHMENT C

## Laboratory Analytical Results

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March 28, 2022

**\*\* LABORATORY ANALYSIS REPORT \*\***

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Radon test result report for:

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

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

# EXPOSURE IN BOWSER-MORNER RADON CHAMBER

CLIENT KCI Technologies, Inc. Job Number 204620

NOMINAL Conditions: Radon Conc 27.0 pCi/L Rel. Hum 50.1 % Temp. 70.0 F

Date Start: 3/18/22 Date Stop: 3/21/22 Date Start: \_\_\_\_\_ Date Stop: \_\_\_\_\_

Time Start: 0705 Time Stop: 0705 Time Start: \_\_\_\_\_ Time Stop: \_\_\_\_\_

Device No.'s: (5) Char Bags - Device No.'s: \_\_\_\_\_

11139367, 11139368, 11139371, \_\_\_\_\_

11139710, 11139717 \_\_\_\_\_

E3 light

Date Start: \_\_\_\_\_ Date Stop: \_\_\_\_\_ Date Start: \_\_\_\_\_ Date Stop: \_\_\_\_\_

Time Start: \_\_\_\_\_ Time Stop: \_\_\_\_\_ Time Start: \_\_\_\_\_ Time Stop: \_\_\_\_\_

Device No.'s: \_\_\_\_\_ Device No.'s: \_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

Date Start: \_\_\_\_\_ Date Stop: \_\_\_\_\_ Date Start: \_\_\_\_\_ Date Stop: \_\_\_\_\_

Time Start: \_\_\_\_\_ Time Stop: \_\_\_\_\_ Time Start: \_\_\_\_\_ Time Stop: \_\_\_\_\_

Device No.'s: \_\_\_\_\_ Device No.'s: \_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

Note: All times are in 24-hour (military) notation, Eastern Standard Time (EST)  
Background = 7  $\mu$ R/h Elevation = 820 ft

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March 30, 2022

**\*\* LABORATORY ANALYSIS REPORT \*\***

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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).

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<b>Kit #</b>	<b>Room Id</b>	<b>Started</b>	<b>Ended</b>	<b>pCi/L</b>	<b>Analyzed</b>
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

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



## Radon Test Kit Chain of Custody

Project Name: MCPS Radon – March 2022 Schools – Retesting

Name of Schools:

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

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	Date	Initials
Radon Test Kits Deployed	03/21/2022	BMM
Radon Test Kits Collected	03/24/2022	BMM
Radon Test Kits Shipped to Lab*	03/25/2022	BMM
Radon Test Kits Received by Lab*	03/28/2022	BMM

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



## MONTGOMERY COUNTY PUBLIC SCHOOLS RADON TESTING

### Executive Summary: Robert Frost Middle School

9210 Scott Drive  
Rockville, MD 20850

Date of Test Report:	3/15/2019
Round of Testing:	Initial <b>Follow-up</b> Post Remediation 2 Year Testing 5 Year Testing HVAC Upgrade Window Replacement New Addition New Facility
# of Rooms Tested:	16
# of Rooms $\geq$ 4.0 pCi/L:	0
Low Value:	<0.4
High Value:	0.9

#### 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: Robert Frost Middle School  
9210 Scott Drive  
Rockville, MD 20850

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 Robert Frost Middle School, located at 9210 Scott Drive, Rockville, MD 20850 (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](http://www.montgomerycountymd.gov/dep/air/radon) or [www.epa.gov/radon](http://www.epa.gov/radon).

PSI visited the site on February 26, 2019 and deployed sixteen (16) 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

<b>Radon Testing Results</b>		
<b>Robert Frost Middle School</b>		
<b>Testing period: 2/26/19 - 3/01/19</b>		
<b>Kit Number</b>	<b>Room / Area</b>	<b>Result (pCi/L)</b>
3923318	101 & 115	<0.4
3923317	103	<0.4
3923315	109C	<0.4
3923316	109D	0.4
3923319	201G	<0.4
3923386	206B	<0.4
3923387	206D	<0.4
3923388	209A	<0.4
3923389	213	0.9
3923390	215	<0.4
3923313	249B	0.7
3923311	256	<0.4
3923312	257	<0.4
3923385	Health Office	<0.4
3923314	Old Staff Lounge	0.4
3923320	Treatment Room	<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

Laboratory Report for:

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

Property Tested:

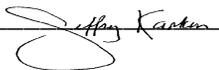
MCPS Radon Survey Robert Frost MS  
9210 Scott Drive  
Rockville MD 20850

Log Number	Device Number	Test Exposure Duration:	Area Tested	Result pCi/L
3220780	3923385	02/26/2019 9:48 am 03/01/2019 9:10 am	Floor Upper Level Room Health Office	< 0.4
3220781	3923386	02/26/2019 9:53 am 03/01/2019 9:15 am	Floor Upper Level Room 206B	< 0.4
3220782	3923388	02/26/2019 9:57 am 03/01/2019 9:22 am	Floor Upper Level Room 209A	< 0.4
3220783	3923389	02/26/2019 9:55 am 03/01/2019 9:19 am	Floor Upper Level Room 213	0.9
3220784	3923390	02/26/2019 9:56 am 03/01/2019 9:20 am	Floor Upper Level Room 215	< 0.4
3220785	3923311	02/26/2019 10:00 am 03/01/2019 9:26 am	Floor Upper Level Room 256	< 0.4
3220786	3923312	02/26/2019 10:01 am 03/01/2019 9:27 am	Floor Upper Level Room 257	< 0.4
3220787	3923387	02/26/2019 9:55 am 03/01/2019 9:17 am	Floor Upper Level Room 206D	< 0.4
3220788	3923313	02/26/2019 10:33 am 03/01/2019 9:40 am	Floor Upper Level Room 249B	0.7
3220789	3923314	02/26/2019 10:36 am 03/01/2019 9:42 am	Floor Lower Level Room Old Staff Lounge	0.4
3220790	3923315	02/26/2019 10:05 am 03/01/2019 9:30 am	Floor Lower Level Room 109C	< 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: 03/06/2019

Report Reviewed By: 

Report Approved By:   
Shawn Price, Director of Laboratory Operations, AccuStar Labs

**Disclaimer:**

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NRPP 105011 AL  
NRSB ARL0007

Laboratory Report for:

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

Property Tested:

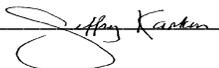
MCPS Radon Survey Robert Frost MS  
9210 Scott Drive  
Rockville MD 20850

Log Number	Device Number	Test Exposure Duration:	Area Tested	Result pCi/L
3220791	3923316	02/26/2019 10:06 am 03/01/2019 9:31 am	Floor Lower Level Room 109D	0.4
3220792	3923317	02/26/2019 10:10 am 03/01/2019 9:33 am	Floor Lower Level Room 103	< 0.4
3220793	3923318	02/26/2019 10:13 am 03/01/2019 9:34 am	Floor Lower Level Room 101 & 115	< 0.4
3220794	3923319	02/26/2019 10:40 am 03/01/2019 9:37 am	Floor Lower Level Room 201G	< 0.4
3220795	3923320	02/26/2019 10:45 am 03/01/2019 9:38 am	Floor Lower Level Room Treatment Room	< 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: 03/06/2019

Report Reviewed By: 

Report Approved By: 

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Shawn Price, Director of Laboratory Operations, AccuStar Labs

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## MONTGOMERY COUNTY PUBLIC SCHOOLS RADON TESTING

### Executive Summary: Robert Frost Middle School

9210 Scott Drive  
Rockville, MD 20850

Date of Test Report:	02/21/2019
Round of Testing:	Initial Follow-up <b>Post Remediation</b> 2 Year Testing 5 Year Testing HVAC Upgrade Window Replacement New Addition New Facility
# of Rooms Tested:	97
# of Rooms $\geq$ 4.0 pCi/L:	0
Low Value:	< 0.4
High Value:	0.8

### Project Status

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



February 21, 2019

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

Re: Radon Testing Services

Location: Robert Frost Middle School  
9210 Scott Drive  
Rockville, MD 20850

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 Robert Frost Middle School, located at 9210 Scott Drive, Rockville, MD 20850 (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](http://www.montgomerycountymd.gov/dep/air/radon) or [www.epa.gov/radon](http://www.epa.gov/radon).

PSI visited the site on November 12, 2018 and deployed one hundred-eighteen (118) 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:

<b>Radon Concentration</b>	<b>Room</b>	<b>Result</b>
$\geq 4.0$ pCi/L	None	NA
$\leq 4.0$ 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, flowing style.

Nand Kaushik, P.E.  
Department Manager, Environmental Services  
[Nand.Kaushik@intertek.com](mailto: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

<b>Radon Testing Results</b>		
<b>Robert Frost Middle School</b>		
<b>Testing period: 11/12/18 - 11/15/18</b>		
<b>Kit Number</b>	<b>Room / Area</b>	<b>Result (pCi/L)</b>
3917165	100	< 0.4
3917166	100	< 0.4
3917085	100A	< 0.4
3917169	101	< 0.4
3917083	102	0.6
3917181	103 (MISSING)	--
3917087	103A	0.4
3917082	104	< 0.4
3917163	105	< 0.4
3917162	106	0.6
3917167	107	0.8
3917168	108	0.4
3917161	109	0.4
--	109C (MISSED)	--
--	109D (MISSED)	--
3916997	110	< 0.4
3916999	110	< 0.4
3916998	111	0.5
3916996	112	< 0.4
3917000	112A	0.4
3916995	113	0.7
3916994	113A	< 0.4
3916992	114	0.5
3916993	114A	0.5
--	Office between 101 and 115 (MISSED)	--
3917170	115	< 0.4
3917051	150	0.5
3917052	151	0.8
3917059	152	0.7
3917058	153	< 0.4
3917055	154	< 0.4
3917057	155	< 0.4
3917056	155B	0.4
3917053	156	0.5
3916980	200B	0.4
3916959	200C	< 0.4
3916960	200D	< 0.4
--	200G (MISSED)	--
3917074	201	< 0.4
3916951	201A	< 0.4
3916952	201B	< 0.4
3916953	201C	< 0.4
3916954	201D	< 0.4

<b>Radon Testing Results</b>		
<b>Robert Frost Middle School</b>		
<b>Testing period: 11/12/18 - 11/15/18</b>		
<b>Kit Number</b>	<b>Room / Area</b>	<b>Result (pCi/L)</b>
3916955	201E	0.4
3916956	201F	< 0.4
3916957	201G	< 0.4
3917079	202	< 0.4
3917080	203	< 0.4
3917071	204	< 0.4
3916971	204AB	< 0.4
3917077	205	< 0.4
3917068	206	< 0.4
3917069	206	< 0.4
3917066	206A	< 0.4
--	206B (INACCESSIBLE)	--
--	206D (INACCESSIBLE)	--
3917065	206E	< 0.4
3917070	206G	< 0.4
3917143	207	< 0.4
3917148	208	0.4
3917147	209	< 0.4
3917144	209A (MISSING)	--
3917145	209B	< 0.4
3917142	210	< 0.4
3917151	211	< 0.4
3917152	212	< 0.4
3917146	213 (MISSING)	--
3917153	214	< 0.4
3917154	215 (MISSING)	--
3917157	216	< 0.4
3917090	217	< 0.4
3917156	217A	< 0.4
3917159	218	< 0.4
3917089	219	< 0.4
3917088	220A	< 0.4
3917155	220B	0.4
3917160	220	0.5
3917044	230	0.6
3917045	231	< 0.4
3917046	232	< 0.4
3917043	233	0.6
3881269	240	< 0.4
3881264	240	0.4
3881254	241	0.4
3917048	242	0.5
3881253	245	< 0.4

<b>Radon Testing Results</b>		
<b>Robert Frost Middle School</b>		
<b>Testing period: 11/12/18 - 11/15/18</b>		
<b>Kit Number</b>	<b>Room / Area</b>	<b>Result (pCi/L)</b>
3881271	245 (TAMPERED)	< 0.4
3916972	246	0.5
3916973	246	0.4
3916974	246A	0.7
3916975	249A	0.4
--	249B (INACCESSIBLE)	--
3916976	249C	0.4
3917149	250	0.4
3917042	251	0.6
3917025	252	< 0.4
3917026	253	0.4
3917150	254	< 0.4
3917028	255	0.4
3917030	256 (MISSING)	--
3917029	257 (MISSING)	--
3917041	258	< 0.4
3916991	259	0.8
3881270	260	0.8
3881263	260	0.7
3916979	Assistant Principal	0.4
3917049	BLR Office	< 0.4
3917072	Conference Room	< 0.4
3917076	Health	< 0.4
--	Health Office (INACCESSIBLE)	--
3916977	Main office	< 0.4
--	Old Staff Lounge (MISSED)	--

<b>Radon Testing Results</b>		
<b>Robert Frost Middle School</b>		
<b>Testing period: 11/12/18 - 11/15/18</b>		
<b>Kit Number</b>	<b>QC Type</b>	<b>Result (pCi/L)</b>
3917084	102(D)	< 0.4
3917164	105(D)	< 0.4
3917054	156 (D)	0.7
3917063	204(D)	< 0.4
3917078	205(D)	< 0.4
3917067	206A(D)	< 0.4
3917158	218(D)	< 0.4
3917047	232(D)	< 0.4
3917050	246(D)	0.5
3917027	253(D)	< 0.4
3917073	Conference Room (D)	0.4
3917141	Field Blank	< 0.4
3917075	Field Blank	< 0.4
3032019	Office Blank	< 0.4
3916312	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

Robert Frost Middle School  
9210 Scott Drive  
Rockville MD 20850

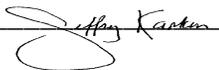
Log Number	Device Number	Test Exposure Duration:		Area Tested	Result (pCi/L)
3195921	3917141	11/12/2018 1:50 pm	11/15/2018 2:18 pm	Not Indicated	< 0.4
3195922	3917075	11/12/2018 1:50 pm	11/15/2018 2:18 pm	Not Indicated	< 0.4
3195923	3916992	11/12/2018 1:50 pm	11/15/2018 11:30 am	First Floor Room 114	0.5
3195924	3916993	11/12/2018 1:53 pm	11/15/2018 11:36 am	First Floor Room 114A	0.5
3195925	3916995	11/12/2018 1:56 pm	11/15/2018 11:35 am	First Floor Room 113	0.7
3195926	3916994	11/12/2018 2:01 pm	11/15/2018 11:37 am	First Floor Room 113A	< 0.4
3195927	3916996	11/12/2018 2:02 pm	11/15/2018 11:40 am	First Floor Room 112	< 0.4
3195928	3916997	11/12/2018 2:03 pm	11/15/2018 11:43 am	First Floor Room 110	< 0.4
3195929	3916998	11/12/2018 2:10 pm	11/15/2018 11:44 am	First Floor Room 111	0.5
3195930	3916999	11/12/2018 2:12 pm	11/15/2018 11:46 am	First Floor Room 110	< 0.4

**Comment:** A copy of this report was e-mailed to PSI - VA.

Test Performed By: Lian Zadeng

Distributed by: Intertek-PSI (VA)

Date Received: 11/17/2018 Date Logged: 11/17/2018 Date Analyzed: 11/17/2018 Date Reported: 11/28/2018

Report Reviewed By: 

Report Approved By: 

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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

Robert Frost Middle School  
9210 Scott Drive  
Rockville MD 20850

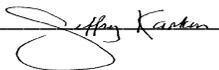
Log Number	Device Number	Test Exposure Duration:		Area Tested	Result (pCi/L)
3195931	3917000	11/12/2018 2:15 pm	11/15/2018 11:41 am	First Floor Room 112A	0.4
3195932	3917051	11/12/2018 2:30 pm	11/15/2018 11:50 am	First Floor Room 150	0.5
3195933	3917052	11/12/2018 2:32 pm	11/15/2018 11:51 am	First Floor Room 151	0.8
3195934	3917053	11/12/2018 2:34 pm	11/15/2018 11:52 am	First Floor Room 156	0.5
3195935	3917054	11/12/2018 2:34 pm	11/15/2018 11:52 am	First Floor Room 156 Duplicate	0.7
3195936	3917055	11/12/2018 2:36 pm	11/15/2018 11:53 am	First Floor Room 154	< 0.4
3195937	3917056	11/12/2018 2:39 pm	11/15/2018 11:54 am	First Floor Room 155B	0.4
3195938	3917057	11/12/2018 2:40 pm	11/15/2018 11:55 am	First Floor Room 155	< 0.4
3195939	3917058	11/12/2018 2:48 pm	11/15/2018 11:58 am	First Floor Room 153	< 0.4
3195940	3917059	11/12/2018 2:52 pm	11/15/2018 11:59 am	First Floor Room 152	0.7

**Comment:** A copy of this report was e-mailed to PSI - VA.

Test Performed By: Lian Zadeng

Distributed by: Intertek-PSI (VA)

Date Received: 11/17/2018    Date Logged: 11/17/2018    Date Analyzed: 11/17/2018    Date Reported: 11/28/2018

Report Reviewed By: 

Report Approved By: 

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NRSB ARL0007

EPA Method #402-R-92-004  
Charcoal Canister  
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Laboratory Report for:

Property Tested: Project # 04481387-1

Intertek-PSI (VA)  
2930 Eskridge Road  
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Robert Frost Middle School  
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Rockville MD 20850

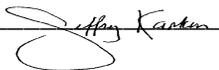
Log Number	Device Number	Test Exposure Duration:		Area Tested	Result (pCi/L)
3195941	3917161	11/12/2018 2:57 pm	11/15/2018 12:01 pm	First Floor Room 109	0.4
3195942	3917162	11/12/2018 3:02 pm	11/15/2018 12:02 pm	First Floor Room 106	0.6
3195943	3917163	11/12/2018 3:05 pm	11/15/2018 12:05 pm	First Floor Room 105	< 0.4
3195944	3917164	11/12/2018 3:05 pm	11/15/2018 12:05 pm	First Floor Room 105 Duplicate	< 0.4
3195945	3917165	11/12/2018 3:10 pm	11/15/2018 12:06 pm	First Floor Room 100	< 0.4
3195946	3917166	11/12/2018 3:12 pm	11/15/2018 12:07 pm	First Floor Room 100	< 0.4
3195947	3917167	11/12/2018 3:13 pm	11/15/2018 12:08 pm	First Floor Room 107	0.8
3195948	3917168	11/12/2018 3:16 pm	11/15/2018 12:10 pm	First Floor Room 108	0.4
3195949	3917169	11/12/2018 3:18 pm	11/15/2018 12:12 pm	First Floor Room 101	< 0.4
3195950	3917170	11/12/2018 3:20 pm	11/15/2018 12:13 pm	First Floor Room 115	< 0.4

**Comment:** A copy of this report was e-mailed to PSI - VA.

Test Performed By: Lian Zadeng

Distributed by: Intertek-PSI (VA)

Date Received: 11/17/2018    Date Logged: 11/17/2018    Date Analyzed: 11/17/2018    Date Reported: 11/28/2018

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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

Robert Frost Middle School  
9210 Scott Drive  
Rockville MD 20850

Log Number	Device Number	Test Exposure Duration:		Area Tested	Result (pCi/L)
3195951	3917082	11/12/2018 3:29 pm	11/15/2018 12:14 pm	First Floor Room 104	< 0.4
3195952	3917083	11/12/2018 3:32 pm	11/15/2018 12:15 pm	First Floor Room 102	0.6
3195953	3917084	11/12/2018 3:32 pm	11/15/2018 12:15 pm	First Floor Room 102 Duplicate	< 0.4
3195954	3917085	11/12/2018 3:37 pm	11/15/2018 12:16 pm	First Floor Room 100A	< 0.4
3195955	3917087	11/12/2018 3:40 pm	11/15/2018 12:18 pm	First Floor Room 103A	0.4
3195956	3917088	11/12/2018 3:46 pm	11/15/2018 12:22 pm	Floor Main Room 220A	< 0.4
3195957	3917089	11/12/2018 3:46 pm	11/15/2018 12:23 pm	Floor Main Room 219	< 0.4
3195958	3917090	11/12/2018 3:53 pm	11/15/2018 12:25 pm	Floor Main Room 217	< 0.4
3195959	3917160	11/12/2018 4:02 pm	11/15/2018 12:26 pm	Floor Main Room 220	0.5
3195960	3917159	11/12/2018 4:05 pm	11/15/2018 12:28 pm	Floor Main Room 218	< 0.4

**Comment:** A copy of this report was e-mailed to PSI - VA.

Test Performed By: Lian Zadeng

Distributed by: Intertek-PSI (VA)

Date Received: 11/17/2018    Date Logged: 11/17/2018    Date Analyzed: 11/17/2018    Date Reported: 11/28/2018

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9210 Scott Drive  
Rockville MD 20850

Log Number	Device Number	Test Exposure Duration:		Area Tested	Result (pCi/L)
3195961	3917158	11/12/2018 4:05 pm	11/15/2018 12:28 pm	Floor Main Room 218 Duplicate	< 0.4
3195962	3917157	11/12/2018 4:07 pm	11/15/2018 12:32 pm	Floor Main Room 216	< 0.4
3195963	3917156	11/12/2018 4:08 pm	11/15/2018 12:33 pm	Floor Main Room 217A	< 0.4
3195964	3917155	11/12/2018 4:11 pm	11/15/2018 12:34 pm	Floor Main Room 220B	0.4
3195965	3917153	11/12/2018 4:15 pm	11/15/2018 12:35 pm	Floor Main Room 214	< 0.4
3195966	3917152	11/12/2018 4:19 pm	11/15/2018 12:36 pm	Floor Main Room 212	< 0.4
3195967	3917151	11/12/2018 4:28 pm	11/15/2018 12:37 pm	Floor Main Room 211	< 0.4
3195968	3917142	11/12/2018 4:29 pm	11/15/2018 12:43 pm	Floor Main Room 210	< 0.4
3195969	3917143	11/12/2018 4:30 pm	11/15/2018 12:45 pm	Floor Main Room 207	< 0.4
3195970	3917145	11/12/2018 4:34 pm	11/15/2018 12:41 pm	Floor Main Room 209B	< 0.4

**Comment:** A copy of this report was e-mailed to PSI - VA.

Test Performed By: Lian Zadeng

Distributed by: Intertek-PSI (VA)

Date Received: 11/17/2018    Date Logged: 11/17/2018    Date Analyzed: 11/17/2018    Date Reported: 11/28/2018

Report Reviewed By: 

Report Approved By: 

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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

Robert Frost Middle School  
9210 Scott Drive  
Rockville MD 20850

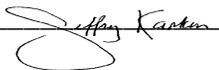
Log Number	Device Number	Test Exposure Duration:		Area Tested	Result (pCi/L)
3195971	3917147	11/12/2018 4:37 pm	11/15/2018 12:46 pm	Floor Main Room 209	< 0.4
3195972	3917148	11/12/2018 4:39 pm	11/15/2018 12:47 pm	Floor Main Room 208	0.4
3195973	3917149	11/12/2018 4:48 pm	11/15/2018 12:49 pm	Floor Main Room 250	0.4
3195974	3917150	11/12/2018 4:49 pm	11/15/2018 12:51 pm	Floor Main Room 254	< 0.4
3195975	3917025	11/12/2018 4:52 pm	11/15/2018 12:52 pm	Floor Main Room 252	< 0.4
3195976	3917026	11/12/2018 4:56 pm	11/15/2018 12:56 pm	Floor Main Room 253	0.4
3195977	3917027	11/12/2018 4:56 pm	11/15/2018 12:56 pm	Floor Main Room 253 Duplicate	< 0.4
3195978	3917028	11/12/2018 4:58 pm	11/15/2018 12:57 pm	Floor Main Room 255	0.4
3195979	3917029	11/12/2018 5:00 pm	11/15/2018 12:58 pm	Floor Main Room 257	0.5
3195980	3917041	11/12/2018 5:07 pm	11/15/2018 1:00 pm	Floor Main Room 258	< 0.4

**Comment:** A copy of this report was e-mailed to PSI - VA.

Test Performed By: Lian Zadeng

Distributed by: Intertek-PSI (VA)

Date Received: 11/17/2018    Date Logged: 11/17/2018    Date Analyzed: 11/17/2018    Date Reported: 11/28/2018

Report Reviewed By: 

Report Approved By: 

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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

Robert Frost Middle School  
9210 Scott Drive  
Rockville MD 20850

Log Number	Device Number	Test Exposure Duration:		Area Tested	Result (pCi/L)
3195981	3916991	11/12/2018 5:14 pm	11/15/2018 1:02 pm	Floor Main Room 259	0.8
3195982	3917042	11/12/2018 5:16 pm	11/15/2018 1:01 pm	Floor Main Room 251	0.6
3195983	3917043	11/12/2018 5:20 pm	11/15/2018 1:10 pm	Floor Main Room 233	0.6
3195984	3917044	11/12/2018 5:27 pm	11/15/2018 1:11 pm	Floor Main Room 230	0.6
3195985	3917045	11/12/2018 5:27 pm	11/15/2018 1:12 pm	Floor Main Room 231	< 0.4
3195986	3917046	11/12/2018 5:31 pm	11/15/2018 1:13 pm	Floor Main Room 232	< 0.4
3195987	3917047	11/12/2018 5:31 pm	11/15/2018 1:13 pm	Floor Main Room 232 Duplicate	< 0.4
3195988	3917048	11/12/2018 5:54 pm	11/15/2018 1:24 pm	Floor Main Room 242	0.5
3195989	3917049	11/12/2018 5:55 pm	11/15/2018 1:22 pm	Floor Main Room 243A	< 0.4
3195990	3916972	11/12/2018 6:03 pm	11/15/2018 1:26 pm	Floor Main Room 246	0.5

**Comment:** A copy of this report was e-mailed to PSI - VA.

Test Performed By: Lian Zadeng

Distributed by: Intertek-PSI (VA)

Date Received: 11/17/2018    Date Logged: 11/17/2018    Date Analyzed: 11/17/2018    Date Reported: 11/28/2018

Report Reviewed By: 

Report Approved By: 

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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

Robert Frost Middle School  
9210 Scott Drive  
Rockville MD 20850

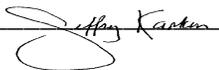
Log Number	Device Number	Test Exposure Duration:		Area Tested	Result (pCi/L)
3195991	3917050	11/12/2018 6:03 pm	11/15/2018 1:26 pm	Floor Main Room 246 Duplicate	0.5
3195992	3916973	11/12/2018 6:05 pm	11/15/2018 1:27 pm	Floor Main Room 246	0.4
3195993	3916974	11/12/2018 6:07 pm	11/15/2018 1:36 pm	Floor Main Room 246A	0.7
3195994	3916975	11/12/2018 6:13 pm	11/15/2018 1:33 pm	Floor Main Room 249A	0.4
3195995	3916976	11/12/2018 6:18 pm	11/15/2018 1:35 pm	Floor Main Room 249C	0.4
3195996	3916977	11/12/2018 6:12 pm	11/15/2018 1:42 pm	Floor Main Room Main Office	< 0.4
3195997	3916979	11/12/2018 6:27 pm	11/15/2018 1:43 pm	Floor Main Room Asst Princ	0.4
3195998	3916980	11/12/2018 6:29 pm	11/15/2018 1:44 pm	Floor Main Room 200B	0.4
3195999	3916958	11/12/2018 6:31 pm	11/15/2018 1:45 pm	Floor Main Room 200A	< 0.4
3196000	3916959	11/12/2018 6:32 pm	11/15/2018 1:47 pm	Floor Main Room 200C	< 0.4

**Comment:** A copy of this report was e-mailed to PSI - VA.

Test Performed By: Lian Zadeng

Distributed by: Intertek-PSI (VA)

Date Received: 11/17/2018    Date Logged: 11/17/2018    Date Analyzed: 11/17/2018    Date Reported: 11/28/2018

Report Reviewed By: 

Report Approved By: 

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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

Robert Frost Middle School  
9210 Scott Drive  
Rockville MD 20850

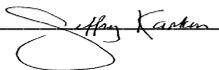
Log Number	Device Number	Test Exposure Duration:		Area Tested	Result (pCi/L)
3196001	3916960	11/12/2018 6:33 pm	11/15/2018 1:48 pm	Floor Main Room 200D	< 0.4
3196002	3916951	11/12/2018 6:40 pm	11/15/2018 1:50 pm	Floor Main Room 201A	< 0.4
3196003	3916952	11/12/2018 6:41 pm	11/15/2018 1:51 pm	Floor Main Room 201B	< 0.4
3196004	3916953	11/12/2018 6:41 pm	11/15/2018 1:52 pm	Floor Main Room 201C	< 0.4
3196005	3916954	11/12/2018 6:42 pm	11/15/2018 1:53 pm	Floor Main Room 201D	< 0.4
3196006	3916955	11/12/2018 6:43 pm	11/15/2018 1:54 pm	Floor Main Room 201E	0.4
3196007	3916956	11/12/2018 6:46 pm	11/15/2018 1:56 pm	Floor Main Room 201F	< 0.4
3196008	3916957	11/12/2018 6:47 pm	11/15/2018 1:57 pm	Floor Main Room 201G	< 0.4
3196009	3917072	11/12/2018 6:54 pm	11/15/2018 1:58 pm	Floor Main Room Conf Rm	< 0.4
3196010	3917073	11/12/2018 6:54 pm	11/15/2018 1:58 pm	Floor Main Room Conf Rm Duplicate	0.4

**Comment:** A copy of this report was e-mailed to PSI - VA.

Test Performed By: Lian Zadeng

Distributed by: Intertek-PSI (VA)

Date Received: 11/17/2018    Date Logged: 11/17/2018    Date Analyzed: 11/17/2018    Date Reported: 11/28/2018

Report Reviewed By: 

Report Approved By: 

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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

Robert Frost Middle School  
9210 Scott Drive  
Rockville MD 20850

Log Number	Device Number	Test Exposure Duration:		Area Tested	Result (pCi/L)
3196011	3917074	11/12/2018 6:57 pm	11/15/2018 2:02 pm	Floor Main Room 201	< 0.4
3196012	3917076	11/12/2018 6:59 pm	11/15/2018 2:14 pm	Floor Main Room Health	< 0.4
3196013	3917077	11/12/2018 7:06 pm	11/15/2018 2:04 pm	Floor Main Room 205	< 0.4
3196014	3917078	11/12/2018 7:06 pm	11/15/2018 2:04 pm	Floor Main Room 205 Duplicate	< 0.4
3196015	3917079	11/12/2018 7:10 pm	11/15/2018 2:06 pm	Floor Main Room 202	< 0.4
3196016	3917080	11/12/2018 7:15 pm	11/15/2018 2:07 pm	Floor Main Room 203	< 0.4
3196017	3917071	11/12/2018 7:16 pm	11/15/2018 2:08 pm	Floor Main Room 204	< 0.4
3196018	3917063	11/12/2018 7:16 pm	11/15/2018 2:08 pm	Floor Main Room 204 Duplicate	< 0.4
3196019	3916971	11/12/2018 7:24 pm	11/15/2018 2:10 pm	Floor Main Room 204AB	< 0.4
3196020	3917065	11/12/2018 7:27 pm	11/15/2018 2:14 pm	Floor Main Room 206E	< 0.4

**Comment:** A copy of this report was e-mailed to PSI - VA.

Test Performed By: Lian Zadeng

Distributed by: Intertek-PSI (VA)

Date Received: 11/17/2018    Date Logged: 11/17/2018    Date Analyzed: 11/17/2018    Date Reported: 11/28/2018

Report Reviewed By: 

Report Approved By: 

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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

Robert Frost Middle School  
9210 Scott Drive  
Rockville MD 20850

Log Number	Device Number	Test Exposure Duration:		Area Tested	Result (pCi/L)
3196021	3917066	11/12/2018 7:30 pm	11/15/2018 2:15 pm	First Floor Room 206A	< 0.4
3196022	3917067	11/12/2018 7:30 pm	11/15/2018 2:15 pm	Floor Main Room 206A Duplicate	< 0.4
3196023	3917068	11/12/2018 7:36 pm	11/15/2018 2:17 pm	Floor Main Room 206	< 0.4
3196024	3917069	11/12/2018 7:36 pm	11/15/2018 2:17 pm	Floor Main Room 206	< 0.4
3196025	3917070	11/12/2018 7:37 pm	11/15/2018 2:18 pm	Floor Main Room 206G	< 0.4
3196026	3032019	11/12/2018 6:00 am	11/15/2018 4:10 pm	Not Indicated	< 0.4
3196027	3916312	11/12/2018 6:00 am	11/15/2018 4:10 pm	Not Indicated	< 0.4

**Comment:** A copy of this report was e-mailed to PSI - VA.

Test Performed By: Lian Zadeng

Distributed by: Intertek-PSI (VA)

Date Received: 11/17/2018 Date Logged: 11/17/2018 Date Analyzed: 11/17/2018 Date Reported: 11/28/2018

Report Reviewed By: 

Report Approved By: 

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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:

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

Property Tested: Project # 04481387-1

MCPS Radon Survey  
Frost MS  
9210 Scott Drive  
Rockville MD 20850

Log Number	Device Number	Test Exposure Duration:	Area Tested	Result pCi/L
2393087	3881253	11/12/2018 6:09 pm - 11/15/2018 1:32 pm	Frost Middle School Room 245	< 0.4
2393089	3881254	11/12/2018 5:52 pm - 11/15/2018 1:17 pm	Frost Middle School Room 241	0.4
2393092	3881263	11/12/2018 5:12 pm - 11/15/2018 1:07 pm	Frost Middle School Room 260	0.7
2393093	3881264	11/12/2018 5:41 pm - 11/15/2018 1:15 pm	Frost Middle School Room 240	0.4
2393098	3881269	11/12/2018 5:40 pm - 11/15/2018 1:14 pm	Frost Middle School Room 240	< 0.4
2393099	3881270	11/12/2018 5:11 pm - 11/15/2018 1:03 pm	Frost Middle School Room 260	0.8
2393100	3881271	11/12/2018 6:09 pm - 11/15/2018 1:31 pm	Frost Middle School Room 245	< 0.4

**Comment:** AMENDED REPORT for all devices on 2/5/19 to include the test start and end dates and times and areas tested.

Distributed by: Intertek-PSI (VA)

Date Received: 11/18/2018    Date Logged: 11/18/2018    Date Analyzed: 11/19/2018    Date Reported: 01/02/2019

Report Reviewed By: 

Report Approved By: 

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

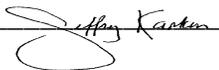
Log Number	Device Number	Test Exposure Duration:	Area Tested	Result pCi/L
3204125	3926831	12/07/2018 9:47 am - 12/10/2018 9:47 am	Spike	36.1
3204126	3926832	12/07/2018 9:47 am - 12/10/2018 9:47 am	Spike	34.8
3204127	3926833	12/07/2018 9:47 am - 12/10/2018 9:47 am	Spike	33.7
3204128	3926834	12/07/2018 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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Shawn Price, Director of Laboratory Operations, AccuStar Labs

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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  $\mu$ 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     |                    |

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	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

RADON SCREENING SURVEY – FOLLOW-UP FROST MIDDLE SCHOOL

9201 Scott Dr., Rockville, Maryland 20850

EXECUTIVE SUMMARY

Date of Test Report:	3/7/18
Round of Testing:	Initial Follow-up Post Remediation
# Rooms Tested	29
# Rooms $\geq$ 4.0 pCi/L:	4
Low Value:	<0.3
High Value:	7.2
Confirmed Rooms $\geq$ 4.0 pCi/L US EPA Action Level	4

Summary of Sampling Events  $\geq$  4.0 pCi/L

Room	Result (pCi/L) 2/1/18	Result (pCi/L) 3/7/18	Average Result (pCi/L)
220	8.1	6.6	7.4
230	7.6	6.1	6.9
218	6.4	7.2	6.8
231	6.0	5.7	5.9

**MCPS RADON TESTING - EXECUTIVE SUMMARY**

Site Name	Robert Frost Middle School
Date of Report	March 7, 2018
Round of Testing	Initial <b>Follow-up</b> Post Remediation 2 year testing 5 year testing HVAC Upgrade Window Replacement New Addition New Facility
# of Rooms Tested	29
# Rooms $\geq 4.0$ pCi/L	4
Lowest Value	< 0.3 pCi/L
Highest Value	7.2 pCi/L

**Project Status**

Rooms with results  $\geq 4.0$  pCi/L:

218 (7.2 pCi/L), 220 (6.6 pCi/L), 230 (6.1 pCi/L), 231 (5.7 pCi/L)

Current Project Status at this time: Retesting completed; use the average of the initial and re-test results in a room to determine if remediation is necessary.



March 7, 2018

Mr. Richard Cox, MS  
Team Leader  
Montgomery County Public Schools  
Division of Maintenance  
Rockville, Maryland 20855

Re: Radon Testing Services

KCI Job #1214634188

**Location: Robert Frost Middle School**

9201 Scott Dr.  
Rockville, Maryland 20850

Dear Mr. Cox:

KCI Technologies, Inc. (KCI) is pleased to submit the following report to Montgomery County Public Schools pursuant to completing a “short-term” 3-day radon test for the Robert Frost Middle School, located at 9201 Scott Dr. in Rockville, Maryland 20850 (subject site).

**SCOPE OF SERVICES**

KCI conducted radon testing at the subject site to evaluate indoor radon levels relative to the USEPA's recommended action level of 4.0 picocuries per Liter (pCi/L) - the level at which EPA recommends that schools take action to reduce the level. KCI conducted the radon testing in accordance with American Association of Radon Scientists and Technologists (AARST) *Protocol for Conducting Measurements of Radon and Radon Decay Products in Schools and Large Buildings*. A National Radon 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](http://www.montgomerycountymd.gov/dep/air/radon) or [www.epa.gov/radon](http://www.epa.gov/radon).

KCI visited the site on February 6, 2018 and deployed thirty-three (33) 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.

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

1. Rooms not successfully tested,
2. Rooms with elevated November 2017 results (i.e.  $\geq 3.5$  pCi/L).

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A floor plan map of the building with the test locations is included as Appendix 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, Inc. prior to being returned to the laboratory for analysis.

KCI returned to the site on February 9, 2018 to retrieve the radon sampling test kits. KCI shipped all radon tests via overnight delivery to Aircheck, Inc. for analysis by gamma-ray spectroscopy. Aircheck, 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 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.

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 teens and 20s and high temperatures ranged from the mid-30s to low-40s. Maximum sustained winds ranged from 10-17 miles per hour. Average humidity was around 75%. 0.41 Inches of precipitation was recorded during the testing period.

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## **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). 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:

<b>Radon Concentration</b>	<b>Room</b>	<b>Result</b>
≥4.0 pCi/L	218	7.2
≥4.0 pCi/L	220	6.6
≥4.0 pCi/L	230	6.1
≥4.0 pCi/L	231	5.7
≤4.0 pCi/L	See Attachment B	See Attachment B

<b>Quality Control Samples</b>	
Results of Blank Canisters:	The field blank, 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 410-316-7800.

---

Sincerely,

A handwritten signature in blue ink that reads "James Matkela". The signature is written in a cursive style with a large initial "J" and "M".

Radon Measurement Specialist  
KCI Technologies, Inc.

Attachments:

B - Radon Test Summary Spreadsheets

C - Laboratory Analytical Results

# 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

<b>Table 1- Radon Testing Results</b>		
<b>Robert Frost Middle School</b>		
<b>Test Period: 02/06/18-02/09/18</b>		
<b>Kit Number</b>	<b>Room / Area</b>	<b>Result</b>
7978971	101	< 0.3
7978972	102	< 0.3
7979327	108	< 0.3
7977616	213	< 0.3
7979390	218	7.2
7194290	220	6.6
7979034	230	6.1
7979364	231	5.7
7979363	233	3.3
7979356	240	2.6
7983746	256	0.6
7978354	259	1.3
7975826	* 111 (Missing)	-
7983754	114 OFFICE	< 0.3
7978984	201G	0.5
7194297	209A	0.6
7194298	217A	1.0
7975828	* ART OFFICE (Tampered)	< 0.3
7978983	ART WORK ROOM	< 0.3
7978973	ASST PRINCIPAL	0.6
7194091	* AUXILLIARY GYM 241 (Tampered)	2.2
7194295	* BOYS LOCKER ROOM (Missing)	-
7983744	BOYS PE OFFICE	1.9
7983736	GIRLS LOCKER ROOM	1.9
7194296	* GIRLS PE OFFICE (Missing)	-
7978969	KITCHEN - 246	2.2
7978970	KITCHEN OFFICE	1.3
7978981	OFF. BETWEEN 101 & 115	< 0.3
7975840	OLD STAFF LOUNGE	1.2

Table Note:

\* Missing or Compromised Sample

<b>Table 2- Radon Testing Results</b>		
<b>Robert Frost Middle School</b>		
<b>Test Period: 02/06/18-02/09/18</b>		
<b>Kit Number</b>	<b>QC Type</b>	<b>Result</b>
7194289	D (217A)	1.0
7978349	* D (240:Tampered)	2.5
7978974	D (ASST PRINCIPAL)	0.6
7978982	FB (KITCHEN-246)	< 0.3

Table Note:

\* Missing or Compromised Sample

# ATTACHMENT C

## Laboratory Analytical Results

Radon test result report for:

**ROBERT FROST MIDDLE SCHOOL  
MAIN**

Kit #	Room Id	Started	Ended	pCi/L	Analyzed
7978971	101	2018-02-06 @ 3:00 pm	2018-02-09 @ 12:00 pm	< 0.3	2018-02-12
7978972	102	2018-02-06 @ 3:00 pm	2018-02-09 @ 12:00 pm	< 0.3	2018-02-12
7979327	108	2018-02-06 @ 3:00 pm	2018-02-09 @ 12:00 pm	< 0.3	2018-02-12
7975826	111	@	@		
7983754	114 OFFICE	2018-02-06 @ 2:00 pm	2018-02-09 @ 12:00 pm	< 0.3	2018-02-12
7978984	201G	2018-02-06 @ 3:00 pm	2018-02-09 @ 12:00 pm	0.5 ± 0.3	2018-02-12
7194297	209A	2018-02-06 @ 1:00 pm	2018-02-09 @ 12:00 pm	0.6 ± 0.3	2018-02-12
7977616	213	2018-02-06 @ 1:00 pm	2018-02-09 @ 12:00 pm	< 0.3	2018-02-12
7194298	217A	2018-02-06 @ 1:00 pm	2018-02-09 @ 12:00 pm	1.0 ± 0.3	2018-02-12
7194289	217A	2018-02-06 @ 1:00 pm	2018-02-09 @ 12:00 pm	1.0 ± 0.3	2018-02-12
7979390	218	2018-02-06 @ 1:00 pm	2018-02-09 @ 12:00 pm	7.2 ± 0.6	2018-02-12
7194290	220	2018-02-06 @ 1:00 pm	2018-02-09 @ 12:00 pm	6.6 ± 0.5	2018-02-12
7979034	230	2018-02-06 @ 2:00 pm	2018-02-09 @ 12:00 pm	6.1 ± 0.5	2018-02-12
7979364	231	2018-02-06 @ 2:00 pm	2018-02-09 @ 12:00 pm	5.7 ± 0.5	2018-02-12
7979363	233	2018-02-06 @ 2:00 pm	2018-02-09 @ 12:00 pm	3.3 ± 0.4	2018-02-12
7978349	240	2018-02-06 @ 2:00 pm	2018-02-09 @ 12:00 pm	2.5 ± 0.4	2018-02-12
7979356	240	2018-02-06 @ 2:00 pm	2018-02-09 @ 12:00 pm	2.6 ± 0.4	2018-02-12
7983746	256	2018-02-06 @ 1:00 pm	2018-02-09 @ 12:00 pm	0.6 ± 0.3	2018-02-12
7978354	259	2018-02-06 @ 1:00 pm	2018-02-09 @ 12:00 pm	1.3 ± 0.3	2018-02-12
7975828	ART OFFICE	2018-02-06 @ 2:00 pm	2018-02-09 @ 12:00 pm	< 0.3	2018-02-12
7978983	ART WORK ROOM	2018-02-06 @ 2:00 pm	2018-02-09 @ 12:00 pm	< 0.3	2018-02-12
7978973	ASST PRINCIPAL	2018-02-06 @ 3:00 pm	2018-02-09 @ 12:00 pm	0.6 ± 0.3	2018-02-12
7978974	ASST PRINCIPAL	2018-02-06 @ 3:00 pm	2018-02-09 @ 12:00 pm	0.6 ± 0.3	2018-02-12
7194091	AUXILLIARYGYM241	2018-02-06 @ 2:00 pm	2018-02-09 @ 12:00 pm	2.2 ± 0.3	2018-02-12
7194295	BOYS LOCKER ROOM	@	@		
7983744	BOYS PE OFFICE	2018-02-06 @ 2:00 pm	2018-02-09 @ 12:00 pm	1.9 ± 0.3	2018-02-12
7983736	GIRLS LOCKER ROO	2018-02-06 @ 2:00 pm	2018-02-09 @ 12:00 pm	1.9 ± 0.4	2018-02-12
7194296	GIRLS PE OFFICE	@	@		
7978969	KITCHEN - 246	2018-02-06 @ 2:00 pm	2018-02-09 @ 12:00 pm	2.2 ± 0.4	2018-02-12
7978970	KITCHEN OFFICE	2018-02-06 @ 2:00 pm	2018-02-09 @ 12:00 pm	1.3 ± 0.3	2018-02-12
7978982	KITCHEN-246	2018-02-06 @ 2:00 pm	2018-02-09 @ 12:00 pm	< 0.3	2018-02-12
7978981	OFF. BTWN101&115	2018-02-06 @ 2:00 pm	2018-02-09 @ 12:00 pm	< 0.3	2018-02-12
7975840	OLD STAFF LOUNGE	2018-02-06 @ 2:00 pm	2018-02-09 @ 12:00 pm	1.2 ± 0.3	2018-02-12



## Radon Test Kit Chain of Custody

Project Name: MCPS Radon

Names of Schools:

1. English Manor
2. Forest Oak Middle School
3. Robert Frost Middle
4. Damascus Elementary School
5. Quince Orchard High School
6. Blair G. Ewing Center

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	Date	Initials
Radon Test Kits Deployed	02/06/18	JM
Radon Test Kits Collected	02/09/18	JM
Radon Test Kits Shipped to Lab*	02/09/18	JM
Radon Test Kits Received by Lab*	02/12/18	JM

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

February 27, 2018

**\*\* LABORATORY ANALYSIS REPORT \*\***

Radon test result report for:  
**OFFICE BLANKS**

<b>Kit #</b>	<b>Room Id</b>	<b>Started</b>	<b>Ended</b>	<b>pCi/L</b>	<b>Analyzed</b>
7979482	1	2018-02-13 @ 1:00 pm	2018-02-16 @ 2:00 pm	< 0.3	2018-02-20
7986991	10	2018-02-13 @ 2:00 pm	2018-02-16 @ 2:00 pm	< 0.3	2018-02-20
7985684	11	2018-02-13 @ 2:00 pm	2018-02-16 @ 2:00 pm	< 0.3	2018-02-20
7986987	12	2018-02-13 @ 2:00 pm	2018-02-16 @ 2:00 pm	< 0.3	2018-02-20
7986993	13	2018-02-13 @ 2:00 pm	2018-02-16 @ 2:00 pm	< 0.3	2018-02-20
7986990	14	2018-02-13 @ 2:00 pm	2018-02-16 @ 2:00 pm	< 0.3	2018-02-20
7979485	2	2018-02-13 @ 1:00 pm	2018-02-16 @ 2:00 pm	< 0.3	2018-02-20
7985686	3	2018-02-13 @ 1:00 pm	2018-02-16 @ 2:00 pm	< 0.3	2018-02-20
7986995	4	2018-02-13 @ 1:00 pm	2018-02-16 @ 2:00 pm	< 0.3	2018-02-20
7986989	5	2018-02-13 @ 1:00 pm	2018-02-16 @ 2:00 pm	< 0.3	2018-02-20
7986998	6	2018-02-13 @ 2:00 pm	2018-02-16 @ 2:00 pm	< 0.3	2018-02-20
7986986	7	2018-02-13 @ 2:00 pm	2018-02-16 @ 2:00 pm	< 0.3	2018-02-20
7986985	8	2018-02-13 @ 2:00 pm	2018-02-16 @ 2:00 pm	< 0.3	2018-02-20
7986997	9	2018-02-13 @ 2:00 pm	2018-02-16 @ 2:00 pm	< 0.3	2018-02-20

Radon test result report for:  
**TRANSIT BLANKS**

<b>Kit #</b>	<b>Room Id</b>	<b>Started</b>	<b>Ended</b>	<b>pCi/L</b>	<b>Analyzed</b>
7984188	1	2018-02-13 @ 2:00 pm	2018-02-16 @ 2:00 pm	< 0.3	2018-02-20
7984044	10	2018-02-13 @ 2:00 pm	2018-02-16 @ 2:00 pm	< 0.3	2018-02-20
7986582	11	2018-02-13 @ 2:00 pm	2018-02-16 @ 2:00 pm	< 0.3	2018-02-20
7986999	12	2018-02-13 @ 2:00 pm	2018-02-16 @ 2:00 pm	< 0.3	2018-02-20
7987000	13	2018-02-13 @ 2:00 pm	2018-02-16 @ 2:00 pm	< 0.3	2018-02-20
7984196	14	2018-02-13 @ 2:00 pm	2018-02-16 @ 2:00 pm	< 0.3	2018-02-20
7986996	2	2018-02-13 @ 2:00 pm	2018-02-16 @ 2:00 pm	< 0.3	2018-02-20
7986994	3	2018-02-13 @ 2:00 pm	2018-02-16 @ 2:00 pm	< 0.3	2018-02-20
7986992	4	2018-02-13 @ 2:00 pm	2018-02-16 @ 2:00 pm	< 0.3	2018-02-20
7985680	5	2018-02-13 @ 2:00 pm	2018-02-16 @ 2:00 pm	< 0.3	2018-02-20
7985698	6	2018-02-13 @ 2:00 pm	2018-02-16 @ 2:00 pm	< 0.3	2018-02-20
7985699	7	2018-02-13 @ 2:00 pm	2018-02-16 @ 2:00 pm	< 0.3	2018-02-20
7985700	8	2018-02-13 @ 2:00 pm	2018-02-16 @ 2:00 pm	< 0.3	2018-02-20
7985872	9	2018-02-13 @ 2:00 pm	2018-02-16 @ 2:00 pm	< 0.3	2018-02-20

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February 28, 2018

**\*\* LABORATORY ANALYSIS REPORT \*\***

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Radon test result report for:

**MCPS - Spike Sample Laboratory Results. Measured values are satisfactory, i.e. within  $\pm 25\%$  of the chamber's reference value (20.9 pCi/L).**

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<b>Kit #</b>	<b>Room Id</b>	<b>Started</b>	<b>Ended</b>	<b>pCi/L</b>	<b>Analyzed</b>
7984181	1	2018-02-16 @ 11:00 am	2018-02-19 @ 11:00 am	19.7 $\pm$ 0.8	2018-02-21
7986621	2	2018-02-16 @ 11:00 am	2018-02-19 @ 11:00 am	19.4 $\pm$ 0.8	2018-02-21
7985683	3	2018-02-16 @ 11:00 am	2018-02-19 @ 11:00 am	19.5 $\pm$ 0.8	2018-02-21
7984168	4	2018-02-16 @ 11:00 am	2018-02-19 @ 11:00 am	20.5 $\pm$ 0.8	2018-02-21
7986618	5	2018-02-16 @ 11:00 am	2018-02-19 @ 11:00 am	19.9 $\pm$ 0.8	2018-02-21
7984169	6	2018-02-16 @ 11:00 am	2018-02-19 @ 11:00 am	20.4 $\pm$ 0.8	2018-02-21

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

# EXPOSURE IN BOWSER-MORNER RADON CHAMBER

CLIENT KCI Technologies Inc. Job Number 183530

NOMINAL Conditions: Radon Conc 20.9 pCi/L Rel. Hum 49.8 % Temp. 79.1 F

Date Start: 2/16/18 Date Stop: 2/19/18 Date Start: \_\_\_\_\_ Date Stop: \_\_\_\_\_  
Time Start: 1052 Time Stop: 1052 Time Start: \_\_\_\_\_ Time Stop: \_\_\_\_\_  
Device No.'s: (6) Char. Bags Device No.'s: \_\_\_\_\_  
7984181, 7986621, 7985683 \_\_\_\_\_  
7984168, 7986618, 7984169 \_\_\_\_\_  
G3 Middle

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  $\mu$ R/h Elevation = 820 ft



**MCPS RADON TESTING - EXECUTIVE SUMMARY**

Site Name	Robert Frost Middle School
Date of Report	February 1, 2018
Round of Testing	Initial Follow-up Post Remediation <b>2 year testing</b> 5 year testing HVAC Upgrade Window Replacement New Addition New Facility
# of Rooms Tested	63
# Rooms $\geq 4.0$ pCi/L	4
Lowest Value	< 0.3 pCi/L
Highest Value	8.1 pCi/L

Rooms with results  $\geq 4.0$  pCi/L:

220 (8.1 pCi/L), 230 (7.6 pCi/L), 218 (6.4 pCi/L), 231 (6.0 pCi/L)

Current Project Status at this time: Testing Completed; retesting needed for results  $\geq 4.0$  pCi/L.

Missing or compromised samples need re-test.



February 1, 2018

Mr. Richard Cox, MS  
Team Leader  
Montgomery County Public Schools  
Division of Maintenance  
Rockville, Maryland 20855

Re: Radon Testing Services

KCI Job #1214694182

**Location: Robert Frost Middle School**

9201 Scott Dr.  
Rockville, Maryland 20850

Dear Mr. Cox:

KCI Technologies, Inc. (KCI) is pleased to submit the following report to Montgomery County Public Schools pursuant to completing a “short-term” 3-day radon test for the Robert Frost Middle School, located at 9201 Scott Dr. in Rockville, Maryland 20850 (subject site).

**SCOPE OF SERVICES**

KCI conducted radon testing at the subject site to evaluate indoor radon levels relative to the USEPA's recommended action level of 4.0 picocuries per Liter (pCi/L) - the level at which EPA recommends that schools take action to reduce the level. KCI conducted the radon testing in accordance with American Association of Radon Scientists and Technologists (AARST) *Protocol for Conducting Measurements of Radon and Radon Decay Products in Schools and Large Buildings*. A National Radon 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](http://www.montgomerycountymd.gov/dep/air/radon) or [www.epa.gov/radon](http://www.epa.gov/radon).

KCI visited the site on December 4, 2017 and deployed sixty-nine (69) 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 Appendix 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, Inc. prior to being returned to the laboratory for analysis.

KCI returned to the site on December 7, 2017 to retrieve the radon sampling test kits. KCI shipped all radon tests via overnight delivery to Aircheck, Inc. for analysis by gamma-ray spectroscopy. Aircheck, 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:

- 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 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.

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 high-20s to mid-40s and high temperatures ranged from the low-40s to mid-50s. Maximum sustained winds ranged from 12-17 miles per hour. Average humidity was around 65%. 0.16 Inches of precipitation was recorded during the testing period.

### **RESULTS**

The sampling locations, field observations, 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). Missing/compromised tests, missed rooms, and locked rooms 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.

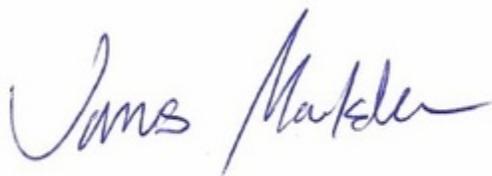
The results of the radon test analysis indicated the following:

<b>Radon Concentration</b>	<b>Room</b>	<b>Result</b>
≥4.0 pCi/L	220	8.1
≥4.0 pCi/L	230	7.6
≥4.0 pCi/L	218	6.4
≥4.0 pCi/L	231	6.0
≤4.0 pCi/L	See Attachment B	See Attachment B

<b>Quality Control Samples</b>	
Results of Blank Canisters:	The office blank 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 410-316-7800.

Sincerely,



James Moulds, CHMM  
Radon Measurement Specialist  
KCI Technologies, Inc.

Attachments:

B- Tables 1-3, Radon Test Summary Spreadsheets

C- Laboratory Analytical Results

# 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

<b>Radon Testing Results</b>		
<b>Robert Frost Middle School</b>		
<b>Test Period: 12/04/17-12/07/17</b>		
<b>Kit Number</b>	<b>Room / Area</b>	<b>Result</b>
7193958	100	< 0.3
7193959	100	0.9
7193933	101	0.6
7193906	103	0.6
7193935	104	0.6
7193948	105	0.7
7193941	106	1.1
7193938	107	1.4
7193947	109	0.6
7193954	110	0.6
7193937	112	1.1
7193931	113	0.8
7193960	114	1.6
7193961	115	0.6
7193944	150	< 0.3
7193943	151	0.8
7193942	152	0.7
7193940	153	1.1
7193927	154	0.8
7193936	155	0.7
7193929	156	0.6
7193928	200	0.7
7193956	203	0.8
7193914	206	< 0.3
7193917	206	0.8
7193951	209	0.7
7193972	215	0.9
7193970	217	1.0
7193968	218	6.4
7193969	219	1.1
7193966	220	8.1
7193909	230	7.6
7193912	231	6.0
7193908	232	2.8
7193903	233	3.3
7977591	240	3.4
7193901	240	1.6
7193973	245	1.6
7193971	245	1.2
7193949	251	0.8
7193918	252	0.9
7193921	253	1.1
7193915	257	1.3
7193911	258	1.5
7193910	260	1.6
7193932	* 102 (Tampered)	0.8

Table Note:

\* Missing or Compromised Sample

<b>Radon Testing Results</b>		
<b>Robert Frost Middle School</b>		
<b>Test Period: 12/04/17-12/07/17</b>		
<b>Kit Number</b>	<b>Room / Area</b>	<b>Result</b>
7193952	109C	0.8
7193934	109D	0.6
7193946	* 111 (Tampered)	0.5
7193945	200A	0.9
7193930	200A1	1.0
7193926	200B	0.8
7193924	200C	0.8
7193925	200D	0.8
7193923	200G	1.0
7193919	201A	0.7
7193904	201B	0.8
7193916	201C	0.6
7193902	201D	< 0.3
7193913	201E	0.8
7193905	201F	0.9
7193967	220A	1.7
7193965	220B	1.9
7193957	* 256 (Missing)	-
7193907	* 259 (Missing)	-
7193922	CONFERENCE ROOM	0.7
7193955	HEALTH ROOM	0.9

Table Note:

\* Missing or Compromised Sample

<b>Radon Testing Results</b>		
<b>Robert Frost Middle School</b>		
<b>Test Period: 12/04/17-12/07/17</b>		
<b>Kit Number</b>	<b>QC Type</b>	<b>Result</b>
7193950	D (HEALTH ROOM)	0.7
7194085	OB (OFFICE BLANK)	< 0.3

Table Note:

\* Missing or Compromised Sample



# ATTACHMENT C

## Laboratory Analytical Results

Radon test result report for:  
**ROBERT FROST MS**  
**ROBERT FROST MS**

Kit #	Room Id	Started	Ended	pCi/L	Analyzed
7193958	100	2017-12-04 @ 9:00 am	2017-12-07 @ 9:00 am	< 0.3	2017-12-11
7193959	100	2017-12-04 @ 9:00 am	2017-12-07 @ 9:00 am	0.9 ± 0.3	2017-12-11
7193933	101	2017-12-04 @ 10:00 am	2017-12-07 @ 9:00 am	0.6 ± 0.3	2017-12-11
7193932	102	2017-12-04 @ 9:00 am	2017-12-07 @ 9:00 am	0.8 ± 0.3	2017-12-11
7193906	103	2017-12-04 @ 9:00 am	2017-12-07 @ 9:00 am	0.6 ± 0.3	2017-12-11
7193935	104	2017-12-04 @ 9:00 am	2017-12-07 @ 9:00 am	0.6 ± 0.3	2017-12-11
7193948	105	2017-12-04 @ 9:00 am	2017-12-07 @ 9:00 am	0.7 ± 0.3	2017-12-11
7193941	106	2017-12-04 @ 9:00 am	2017-12-07 @ 9:00 am	1.1 ± 0.3	2017-12-11
7193938	107	2017-12-04 @ 9:00 am	2017-12-07 @ 9:00 am	1.4 ± 0.3	2017-12-11
7193947	109	2017-12-04 @ 10:00 am	2017-12-07 @ 9:00 am	0.6 ± 0.3	2017-12-11
7193952	109C	2017-12-04 @ 10:00 am	2017-12-07 @ 9:00 am	0.8 ± 0.3	2017-12-11
7193934	109D	2017-12-04 @ 9:00 am	2017-12-07 @ 9:00 am	0.6 ± 0.3	2017-12-11
7193954	110	2017-12-04 @ 10:00 am	2017-12-07 @ 9:00 am	0.6 ± 0.3	2017-12-11
7193946	111	2017-12-04 @ 10:00 am	2017-12-07 @ 9:00 am	0.5 ± 0.3	2017-12-11
7193937	112	2017-12-04 @ 10:00 am	2017-12-07 @ 9:00 am	1.1 ± 0.3	2017-12-11
7193931	113	2017-12-04 @ 10:00 am	2017-12-07 @ 9:00 am	0.8 ± 0.3	2017-12-11
7193960	114	2017-12-04 @ 10:00 am	2017-12-07 @ 9:00 am	1.6 ± 0.3	2017-12-11
7193961	115	2017-12-04 @ 10:00 am	2017-12-07 @ 9:00 am	0.6 ± 0.3	2017-12-11
7193944	150	2017-12-04 @ 10:00 am	2017-12-07 @ 9:00 am	< 0.3	2017-12-11
7193943	151	2017-12-04 @ 10:00 am	2017-12-07 @ 9:00 am	0.8 ± 0.3	2017-12-11
7193942	152	2017-12-04 @ 10:00 am	2017-12-07 @ 9:00 am	0.7 ± 0.3	2017-12-11
7193940	153	2017-12-04 @ 10:00 am	2017-12-07 @ 9:00 am	1.1 ± 0.3	2017-12-11
7193927	154	2017-12-04 @ 10:00 am	2017-12-07 @ 9:00 am	0.8 ± 0.3	2017-12-11
7193936	155	2017-12-04 @ 10:00 am	2017-12-07 @ 9:00 am	0.7 ± 0.3	2017-12-11
7193929	156	2017-12-04 @ 10:00 am	2017-12-07 @ 9:00 am	0.6 ± 0.3	2017-12-11
7193928	200	2017-12-04 @ 11:00 am	2017-12-07 @ 9:00 am	0.7 ± 0.3	2017-12-11
7193945	200A	2017-12-04 @ 11:00 am	2017-12-07 @ 9:00 am	0.9 ± 0.3	2017-12-11
7193930	200A1	2017-12-04 @ 11:00 am	2017-12-07 @ 9:00 am	1.0 ± 0.3	2017-12-11
7193926	200B	2017-12-04 @ 11:00 am	2017-12-07 @ 9:00 am	0.8 ± 0.3	2017-12-11
7193924	200C	2017-12-04 @ 11:00 am	2017-12-07 @ 9:00 am	0.8 ± 0.3	2017-12-11
7193925	200D	2017-12-04 @ 11:00 am	2017-12-07 @ 9:00 am	0.8 ± 0.3	2017-12-11
7193923	200G	2017-12-04 @ 11:00 am	2017-12-07 @ 10:00 am	1.0 ± 0.3	2017-12-11
7193919	201A	2017-12-04 @ 11:00 am	2017-12-07 @ 10:00 am	0.7 ± 0.3	2017-12-11
7193904	201B	2017-12-04 @ 11:00 am	2017-12-07 @ 10:00 am	0.8 ± 0.3	2017-12-11
7193916	201C	2017-12-04 @ 11:00 am	2017-12-07 @ 10:00 am	0.6 ± 0.3	2017-12-11
7193902	201D	2017-12-04 @ 11:00 am	2017-12-07 @ 10:00 am	< 0.3	2017-12-11
7193913	201E	2017-12-04 @ 11:00 am	2017-12-07 @ 10:00 am	0.8 ± 0.3	2017-12-11

Radon test result report for:  
**ROBERT FROST MS**  
**ROBERT FROST MS**

Kit #	Room Id	Started	Ended	pCi/L	Analyzed
7193905	201F	2017-12-04 @ 11:00 am	2017-12-07 @ 10:00 am	0.9 ± 0.3	2017-12-11
7193956	203	2017-12-04 @ 11:00 am	2017-12-07 @ 10:00 am	0.8 ± 0.3	2017-12-11
7193917	206	2017-12-04 @ 12:00 pm	2017-12-07 @ 10:00 am	0.8 ± 0.3	2017-12-11
7193914	206	2017-12-04 @ 12:00 pm	2017-12-07 @ 10:00 am	< 0.3	2017-12-11
7193951	209	2017-12-04 @ 12:00 pm	2017-12-07 @ 10:00 am	0.7 ± 0.3	2017-12-11
7193972	215	2017-12-04 @ 1:00 pm	2017-12-07 @ 10:00 am	0.9 ± 0.3	2017-12-11
7193970	217	2017-12-04 @ 1:00 pm	2017-12-07 @ 10:00 am	1.0 ± 0.3	2017-12-11
7193968	218	2017-12-04 @ 1:00 pm	2017-12-07 @ 10:00 am	6.4 ± 0.5	2017-12-11
7193969	219	2017-12-04 @ 1:00 pm	2017-12-07 @ 10:00 am	1.1 ± 0.3	2017-12-12
7193966	220	2017-12-04 @ 1:00 pm	2017-12-07 @ 10:00 am	8.1 ± 0.5	2017-12-11
7193967	220A	2017-12-04 @ 1:00 pm	2017-12-07 @ 10:00 am	1.7 ± 0.3	2017-12-11
7193965	220B	2017-12-04 @ 1:00 pm	2017-12-07 @ 10:00 am	1.9 ± 0.3	2017-12-11
7193909	230	2017-12-04 @ 12:00 pm	2017-12-07 @ 10:00 am	7.6 ± 0.5	2017-12-11
7193912	231	2017-12-04 @ 12:00 pm	2017-12-07 @ 10:00 am	6.0 ± 0.4	2017-12-11
7193908	232	2017-12-04 @ 12:00 pm	2017-12-07 @ 10:00 am	2.8 ± 0.4	2017-12-11
7193903	233	2017-12-04 @ 12:00 pm	2017-12-07 @ 10:00 am	3.3 ± 0.4	2017-12-11
7977591	240	2017-12-04 @ 1:00 pm	2017-12-07 @ 10:00 am	3.4 ± 0.4	2017-12-11
7193901	240	2017-12-04 @ 1:00 pm	2017-12-07 @ 10:00 am	1.6 ± 0.3	2017-12-11
7193971	245	2017-12-04 @ 1:00 pm	2017-12-07 @ 10:00 am	1.2 ± 0.3	2017-12-11
7193973	245	2017-12-04 @ 1:00 pm	2017-12-07 @ 10:00 am	1.6 ± 0.3	2017-12-11
7193949	251	2017-12-04 @ 12:00 pm	2017-12-07 @ 10:00 am	0.8 ± 0.3	2017-12-11
7193918	252	2017-12-04 @ 12:00 pm	2017-12-07 @ 10:00 am	0.9 ± 0.3	2017-12-11
7193921	253	2017-12-04 @ 12:00 pm	2017-12-07 @ 10:00 am	1.1 ± 0.3	2017-12-11
7193957	256	@	@		
7193915	257	2017-12-04 @ 12:00 pm	2017-12-07 @ 10:00 am	1.3 ± 0.3	2017-12-11
7193911	258	2017-12-04 @ 12:00 pm	2017-12-07 @ 10:00 am	1.5 ± 0.4	2017-12-12
7193907	259	@	@		
7193910	260	2017-12-04 @ 12:00 pm	2017-12-07 @ 10:00 am	1.6 ± 0.3	2017-12-11
7193922	CONFERENCE ROOM	2017-12-04 @ 11:00 am	2017-12-07 @ 9:00 am	0.7 ± 0.3	2017-12-11
7193950	HEALTH ROOM	2017-12-04 @ 11:00 am	2017-12-07 @ 10:00 am	0.7 ± 0.3	2017-12-11
7193955	HEALTH ROOM	2017-12-04 @ 11:00 am	2017-12-07 @ 10:00 am	0.9 ± 0.3	2017-12-11

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December 29, 2017

**\*\* LABORATORY ANALYSIS REPORT \*\***

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Radon test result report for:  
**ROBERT FROST MS**  
**MAIN**

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<b>Kit #</b>	<b>Room Id</b>	<b>Started</b>	<b>Ended</b>	<b>pCi/L</b>	<b>Analyzed</b>
7194085	OFFICE BLANK	2017-12-04 @ 2:00 pm	2017-12-07 @ 2:00 pm	< 0.3	2017-12-11

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Air Chek, Inc. 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 Phase

Names of Schools:

- |                                       |                                  |
|---------------------------------------|----------------------------------|
| 1. Brooke Grove Elementary School     | 14. Newport Mill Middle School   |
| 2. Brown Station Elementary School    | 15. Oakview Elementary School    |
| 3. Diamond Elementary School Addition | 16. Quince Orchard High School   |
| 4. Dufief Elementary School           | 17. Robert Frost Middle School   |
| 5. Emory Grove Center                 | 18. Rosa Parks Middle School     |
| 6. Fields Road Elementary School      | 19. South Lake Elementary School |
| 7. Facilities Maintenance Depot       |                                  |
| 8. Forest Oak Middle School           |                                  |
| 9. Francis Scott Key Middle School    |                                  |
| 10. Gaithersburg Elementary School    |                                  |
| 11. Gaithersburg Middle School        |                                  |
| 12. Germantown Elementary School      |                                  |
| 13. Greenwood Elementary School       |                                  |
| 14. Jones Lane Elementary School      |                                  |

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	Date	Initials
Radon Test Kits Deployed	12/04/17	JM
Radon Test Kits Collected	12/07/17	JM
Radon Test Kits Shipped to Lab*	12/07/17	JM
Radon Test Kits Received by Lab*	12/11/17	JM

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

Radon test result report for:**TRANSIT 2  
MAIN**

Kit #	Room Id	Started	Ended	pCi/L	Analyzed
7193838	TRANSIT 1	2017-12-05 @ 2:00 pm	2017-12-08 @ 2:00 pm	< 0.3	2017-12-13
7979384	TRANSIT 10	2017-12-05 @ 2:00 pm	2017-12-08 @ 2:00 pm	< 0.3	2017-12-13
7979385	TRANSIT 11	2017-12-05 @ 2:00 pm	2017-12-08 @ 2:00 pm	< 0.3	2017-12-13
7984056	TRANSIT 12	2017-12-05 @ 2:00 pm	2017-12-08 @ 2:00 pm	< 0.3	2017-12-13
7983834	TRANSIT 13	2017-12-05 @ 2:00 pm	2017-12-08 @ 2:00 pm	< 0.3	2017-12-13
7194097	TRANSIT 14	2017-12-05 @ 2:00 pm	2017-12-08 @ 2:00 pm	< 0.3	2017-12-13
7194092	TRANSIT 15	2017-12-05 @ 2:00 pm	2017-12-08 @ 2:00 pm	< 0.3	2017-12-13
7193840	TRANSIT 16	2017-12-05 @ 2:00 pm	2017-12-08 @ 2:00 pm	< 0.3	2017-12-13
7979072	TRANSIT 17	2017-12-05 @ 2:00 pm	2017-12-08 @ 2:00 pm	< 0.3	2017-12-13
7979071	TRANSIT 18	2017-12-05 @ 2:00 pm	2017-12-08 @ 2:00 pm	< 0.3	2017-12-13
7979065	TRANSIT 19	2017-12-05 @ 2:00 pm	2017-12-08 @ 2:00 pm	0.6 ± 0.4	2017-12-13
7978194	TRANSIT 2	2017-12-05 @ 2:00 pm	2017-12-08 @ 2:00 pm	< 0.3	2017-12-13
7985660	TRANSIT 20	2017-12-05 @ 2:00 pm	2017-12-08 @ 2:00 pm	< 0.3	2017-12-13
7985661	TRANSIT 21	2017-12-05 @ 2:00 pm	2017-12-08 @ 2:00 pm	0.7 ± 0.4	2017-12-13
7193843	TRANSIT 22	2017-12-05 @ 2:00 pm	2017-12-08 @ 2:00 pm	< 0.3	2017-12-13
7984055	TRANSIT 23	2017-12-05 @ 2:00 pm	2017-12-08 @ 2:00 pm	< 0.3	2017-12-13
7983813	TRANSIT 24	2017-12-05 @ 2:00 pm	2017-12-08 @ 2:00 pm	< 0.3	2017-12-13
7983827	TRANSIT 25	2017-12-05 @ 2:00 pm	2017-12-08 @ 2:00 pm	< 0.3	2017-12-13
7978193	TRANSIT 3	2017-12-05 @ 2:00 pm	2017-12-08 @ 2:00 pm	< 0.3	2017-12-13
7978189	TRANSIT 4	2017-12-05 @ 2:00 pm	2017-12-08 @ 2:00 pm	0.5 ± 0.4	2017-12-13
7986187	TRANSIT 5	2017-12-05 @ 2:00 pm	2017-12-08 @ 2:00 pm	< 0.3	2017-12-13
7986188	TRANSIT 6	2017-12-05 @ 2:00 pm	2017-12-08 @ 2:00 pm	< 0.3	2017-12-13
7986177	TRANSIT 7	2017-12-05 @ 2:00 pm	2017-12-08 @ 2:00 pm	< 0.3	2017-12-13
7979077	TRANSIT 8	2017-12-05 @ 2:00 pm	2017-12-08 @ 2:00 pm	< 0.3	2017-12-13
7979386	TRANSIT 9	2017-12-05 @ 2:00 pm	2017-12-08 @ 2:00 pm	< 0.3	2017-12-13

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December 19, 2017

**\*\* LABORATORY ANALYSIS REPORT \*\***

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Radon test result report for:

**MCPS - Spike Sample Laboratory Results. Measured values are satisfactory, i.e. within  $\pm 25\%$  of the chamber's reference value (27.7 pCi/L).**

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<b>Kit #</b>	<b>Room Id</b>	<b>Started</b>	<b>Ended</b>	<b>pCi/L</b>	<b>Analyzed</b>
7975075	S1	2017-12-01 @ 11:00 am	2017-12-04 @ 11:00 am	25.6 $\pm$ 0.7	2017-12-07
7975064	S2	2017-12-01 @ 11:00 am	2017-12-04 @ 11:00 am	27.4 $\pm$ 0.8	2017-12-07
7975063	S3	2017-12-01 @ 11:00 am	2017-12-04 @ 11:00 am	26.3 $\pm$ 0.7	2017-12-07
7975065	S4	2017-12-01 @ 11:00 am	2017-12-04 @ 11:00 am	23.0 $\pm$ 0.7	2017-12-07
7975069	S5	2017-12-01 @ 11:00 am	2017-12-04 @ 11:00 am	25.6 $\pm$ 0.7	2017-12-07
7975070	S6	2017-12-01 @ 11:00 am	2017-12-04 @ 11:00 am	23.0 $\pm$ 0.7	2017-12-07

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

# EXPOSURE IN BOWSER-MORNER RADON CHAMBER

CLIENT KCI Technologies Inc. Job Number 182393

NOMINAL Conditions: Radon Conc 27.7 pCi/L Rel. Hum 49.1 % Temp. 70.1 F

Date Start: 12/1/17 Date Stop: 12/4/17 Date Start: \_\_\_\_\_ Date Stop: \_\_\_\_\_

Time Start: 1049 Time Stop: 1049 Time Start: \_\_\_\_\_ Time Stop: \_\_\_\_\_

Device No.'s: (6) Char. Bags. Device No.'s: \_\_\_\_\_

7975075, 7975064, 7975063, \_\_\_\_\_

7975065, 7975069, 7975070 \_\_\_\_\_

F4 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  $\mu$ R/h Elevation = 820 ft



## MCPS RADON TESTING

Executive Summary: Robert Frost Middle School

Date of Test Report:	10/20/2016
Round of Testing:	Initial Follow-up Post Remediation
# Rooms Tested:	15
# Rooms $\geq$ 4.0 pCi/L:	0
Low Value:	< 0.3
High Value:	< 0.3

Project Status:

Post remediation testing completed; no further action at this time.



October 20, 2016

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

Re: **Radon Testing Services**  
KCI Job # 12146341.54

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

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 Robert Frost Middle School, located at 9201 Scott Drive in Rockville, Maryland 20850 (subject site).

**Scope of Services:**

KCI conducted radon testing at the subject site to evaluate indoor radon levels relative to the USEPA's recommended action level of 4.0 picocuries per Liter (pCi/L) - the level at which EPA recommends that schools take action to reduce the level. KCI conducted the radon testing in accordance with American Association of Radon Scientists and Technologists (AARST) *Protocol for Conducting Measurements of Radon and Radon Decay Products in Schools and Large Buildings*. A National Radon 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](http://www.montgomerycountymd.gov/dep/air/radon) or [www.epa.gov/radon](http://www.epa.gov/radon).

KCI visited the site on September 27, 2016 and deployed eighteen (18) 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 September 30, 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:**

These tests represent:

- Post-mitigation testing for radon mitigation systems installed recently.

To expedite the testing, tests were conducted in September as soon as students and staff returned to:

- Confirm the success of the mitigation system(s).

Future periodic testing should be conducted during the heating season in ideal conditions as described below. 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 cooling mode; therefore, KCI concludes that this test was not conducted during ideal testing conditions.

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.

KCI also compiled weather data for the testing period and conducted observations of relevant field conditions. During the test period, weather records indicate low temperatures were in the 50s and high temperatures in the mid-60s to mid-70s. Maximum sustained winds ranged from 3-15 miles per hour. Average humidity ranged from 71 to 89 percent. Rain (1.83 inches in Gaithersburg, MD) was recorded on 9/29/16. The weather conditions during the testing period may have resulted in atypical radon test results for this facility.

### **Results:**

The results of the radon test analysis indicated the following:

<b>Radon Concentration</b>	<b>Room</b>	<b>Result</b>
<b>≥4.0 pCi/L</b>	none	n/a
<b>&lt;4.0 pCi/L</b>	See Attachment B	

Notes:

D- Duplicate sample

The field blank, lab transit blanks, and office 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,



James M. Mouldale  
Radon Measurement Specialist  
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

<b>Radon Testing Results</b>		
<b>Robert Frost Middle School</b>		
<b>Test Period: 09/27/16-09/30/16</b>		
<b>Kit Number</b>	<b>Room / Area</b>	<b>Result</b>
7714261	100	< 0.3
7714244	100	< 0.3
7714236	102	< 0.3
7714252	103	< 0.3
7714247	104	< 0.3
7714254	105	< 0.3
7714243	106	< 0.3
7714239	107	< 0.3
7714265	108	< 0.3
7714215	152	< 0.3
7714271	153	< 0.3
7714212	154	< 0.3
7714268	155	< 0.3
7714258	156	< 0.3
7714246	100A	< 0.3
7714240	* 110 (Open Window)	< 0.3

Table Note:

\* Missing or Compromised Sample

<b>Radon Testing Results</b>		
<b>Robert Frost Middle School</b>		
<b>Test Period: 09/27/16-09/30/16</b>		
<b>Kit Number</b>	<b>QC Type</b>	<b>Result</b>
7714211	D (100A)	< 0.3
7714257	FB (154)	< 0.3

Table Note:

\* Missing or Compromised Sample

# ATTACHMENT C

## Laboratory Analytical Results

October 7, 2016

**\*\* LABORATORY ANALYSIS REPORT \*\***

Radon test result report for:

**ROBERT FROST MIDDLE SCHOOL  
MAIN**

<b>Kit #</b>	<b>Room Id</b>	<b>Started</b>	<b>Ended</b>	<b>pCi/L</b>	<b>Analyzed</b>
7714244	100	2016-09-27 @ 1:00 pm	2016-09-30 @ 11:00 am	< 0.3	2016-10-03
7714261	100	2016-09-27 @ 1:00 pm	2016-09-30 @ 11:00 am	< 0.3	2016-10-03
7714211	100A	2016-09-27 @ 1:00 pm	2016-09-30 @ 11:00 am	< 0.3	2016-10-03
7714246	100A	2016-09-27 @ 1:00 pm	2016-09-30 @ 11:00 am	< 0.3	2016-10-03
7714236	102	2016-09-27 @ 1:00 pm	2016-09-30 @ 11:00 am	< 0.3	2016-10-03
7714252	103	2016-09-27 @ 1:00 pm	2016-09-30 @ 11:00 am	< 0.3	2016-10-03
7714247	104	2016-09-27 @ 1:00 pm	2016-09-30 @ 11:00 am	< 0.3	2016-10-03
7714254	105	2016-09-27 @ 1:00 pm	2016-09-30 @ 11:00 am	< 0.3	2016-10-03
7714243	106	2016-09-27 @ 1:00 pm	2016-09-30 @ 11:00 am	< 0.3	2016-10-03
7714239	107	2016-09-27 @ 1:00 pm	2016-09-30 @ 11:00 am	< 0.3	2016-10-03
7714265	108	2016-09-27 @ 1:00 pm	2016-09-30 @ 11:00 am	< 0.3	2016-10-03
7714240	110	2016-09-27 @ 1:00 pm	2016-09-30 @ 11:00 am	< 0.3	2016-10-03
7714215	152	2016-09-27 @ 1:00 pm	2016-09-30 @ 11:00 am	< 0.3	2016-10-03
7714271	153	2016-09-27 @ 1:00 pm	2016-09-30 @ 11:00 am	< 0.3	2016-10-03
7714212	154	2016-09-27 @ 1:00 pm	2016-09-30 @ 11:00 am	< 0.3	2016-10-03
7714257	154	2016-09-27 @ 1:00 pm	2016-09-30 @ 11:00 am	< 0.3	2016-10-03
7714268	155	2016-09-27 @ 1:00 pm	2016-09-30 @ 11:00 am	< 0.3	2016-10-03
7714258	156	2016-09-27 @ 1:00 pm	2016-09-30 @ 11:00 am	< 0.3	2016-10-03

October 7, 2016

**\*\* LABORATORY ANALYSIS REPORT \*\***

Radon test result report for:

**MCPS Radon**

**Phase 18 Office Blanks**

<b>Kit #</b>	<b>Room Id</b>	<b>Started</b>	<b>Ended</b>	<b>pCi/L</b>	<b>Analyzed</b>
7802697	1	2016-09-26 @ 11:00 am	2016-09-29 @ 11:00 am	< 0.3	2016-10-03
7801899	10	2016-09-26 @ 11:00 am	2016-09-29 @ 11:00 am	< 0.3	2016-10-03
7802932	11	2016-09-26 @ 11:00 am	2016-09-29 @ 11:00 am	< 0.3	2016-10-03
7802935	12	2016-09-26 @ 11:00 am	2016-09-29 @ 11:00 am	< 0.3	2016-10-03
7802915	13	2016-09-26 @ 11:00 am	2016-09-29 @ 11:00 am	< 0.3	2016-10-03
7802941	2	2016-09-26 @ 11:00 am	2016-09-29 @ 11:00 am	< 0.3	2016-10-03
7802942	3	2016-09-26 @ 11:00 am	2016-09-29 @ 11:00 am	< 0.3	2016-10-03
7802919	4	2016-09-26 @ 11:00 am	2016-09-29 @ 11:00 am	< 0.3	2016-10-03
7802918	5	2016-09-26 @ 11:00 am	2016-09-29 @ 11:00 am	< 0.3	2016-10-03
7802917	6	2016-09-26 @ 11:00 am	2016-09-29 @ 11:00 am	< 0.3	2016-10-03
7802916	7	2016-09-26 @ 11:00 am	2016-09-29 @ 11:00 am	< 0.3	2016-10-03
7802952	8	2016-09-26 @ 11:00 am	2016-09-29 @ 11:00 am	< 0.3	2016-10-03
7802928	9	2016-09-26 @ 11:00 am	2016-09-29 @ 11:00 am	< 0.3	2016-10-03

Radon test result report for:

**MCPS Radon****Phase 18 Transit Blanks**

<b>Kit #</b>	<b>Room Id</b>	<b>Started</b>	<b>Ended</b>	<b>pCi/L</b>	<b>Analyzed</b>
7714274	1	2016-09-26 @ 10:00 am	2016-09-29 @ 10:00 am	< 0.3	2016-10-03
7802962	10	2016-09-26 @ 10:00 am	2016-09-29 @ 10:00 am	< 0.3	2016-10-03
7714295	11	2016-09-26 @ 10:00 am	2016-09-29 @ 10:00 am	< 0.3	2016-10-03
7714299	12	2016-09-26 @ 10:00 am	2016-09-29 @ 10:00 am	< 0.3	2016-10-03
7714273	13	2016-09-26 @ 10:00 am	2016-09-29 @ 10:00 am	< 0.3	2016-10-03
7714270	14	2016-09-26 @ 10:00 am	2016-09-29 @ 10:00 am	< 0.3	2016-10-03
7802965	2	2016-09-26 @ 10:00 am	2016-09-29 @ 10:00 am	< 0.3	2016-10-03
7802696	3	2016-09-26 @ 10:00 am	2016-09-29 @ 10:00 am	< 0.3	2016-10-03
7802690	4	2016-09-26 @ 10:00 am	2016-09-29 @ 10:00 am	< 0.3	2016-10-03
7714275	5	2016-09-26 @ 10:00 am	2016-09-29 @ 10:00 am	< 0.3	2016-10-03
7714298	6	2016-09-26 @ 10:00 am	2016-09-29 @ 10:00 am	< 0.3	2016-10-03
7802990	7	2016-09-26 @ 10:00 am	2016-09-29 @ 10:00 am	< 0.3	2016-10-03
7802974	8	2016-09-26 @ 10:00 am	2016-09-29 @ 10:00 am	< 0.3	2016-10-03
7802694	9	2016-09-26 @ 10:00 am	2016-09-29 @ 10:00 am	< 0.3	2016-10-03

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October 12, 2016

**\*\* LABORATORY ANALYSIS REPORT \*\***

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Radon test result report for:  
**MCPS Radon  
Spike Sample Results**

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<b>Kit #</b>	<b>Room Id</b>	<b>Started</b>	<b>Ended</b>	<b>pCi/L</b>	<b>Analyzed</b>
7769880	101	2016-09-24 @ 8:00 am	2016-09-26 @ 8:00 am	22.9 ± 1.0	2016-09-28
7769884	102	2016-09-24 @ 8:00 am	2016-09-26 @ 8:00 am	22.4 ± 1.0	2016-09-28
7769885	103	2016-09-24 @ 8:00 am	2016-09-26 @ 8:00 am	23.0 ± 1.0	2016-09-28
7769890	104	2016-09-24 @ 8:00 am	2016-09-26 @ 8:00 am	22.3 ± 1.0	2016-09-28
7769891	105	2016-09-24 @ 8:00 am	2016-09-26 @ 8:00 am	26.8 ± 1.2	2016-09-28
7769899	106	2016-09-24 @ 8:00 am	2016-09-26 @ 8:00 am	24.1 ± 1.1	2016-09-28

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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 176788

NOMINAL Conditions: Radon Conc 26.1 pCi/L Rel. Hum 49.6 % Temp. 70.0 F

Date Start: 9/24/16 Date Stop: 9/26/16 Date Start: \_\_\_\_\_ Date Stop: \_\_\_\_\_

Time Start: 0758 Time Stop: 0758 Time Start: \_\_\_\_\_ Time Stop: \_\_\_\_\_

Device No.'s: (6) Char. Bags - Device No.'s: \_\_\_\_\_

7769899, 7769884, 7769885, \_\_\_\_\_

7769889, 7769890, 7769891 \_\_\_\_\_

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  $\mu$ R/h Elevation = 820 ft**



## Radon Test Kit Chain of Custody

Project Name: MCPS Radon Phase 18

Name of Schools:

- |                                     |  |
|-------------------------------------|--|
| 1. Wood Acres Elementary School     | 14. Lourie Center                        |
| 2. Walt Whitman High School         | 15. Shriver Elementary School            |
| 3. Burning Tree Elementary School   | 16. Viers Mill Elementary School         |
| 4. Ashburton Elementary School      | 17. Highland Elementary School           |
| 5. Bethesda Maintenance             | 18. Newport Middle School                |
| 6. Bethesda Transportation          | 19. Albert Einstein High School          |
| 7. Herbert Hoover Middle School     | 20. Sligo Middle School                  |
| 8. Cold Spring Elementary School    | 21. East Silver Spring Elementary School |
| 9. Garret Park Elementary School    | 22. Oak View Elementary School           |
| 10. Rock View Elementary School     | 23. Roscoe Nix Elementary School         |
| 11. Francis Scott Key Middle School | 24. Northwood High School                |
| 12. Montgomery Blair High School    | 25. Springbrook High School              |
| 13. Stephen Knolls School           | 26. John F. Kennedy High School          |

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	Date	Initials
Radon Test Kits Deployed	9/26/16	JM
Radon Test Kits Collected	9/29/16	JM
Radon Test Kits Shipped to Lab*	9/30/16	JM
Radon Test Kits Received by Lab*	10/03/16	JM

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



## Radon Test Kit Chain of Custody

Project Name: MCPS Radon Phase 18

Name of Schools:

- |  |                                   |
|--|-----------------------------------|
| 1. Damascus High School                  | 17. Watkins Mills High School     |
| 2. Cedar Grove Elementary School         | 18. Forest Oak Middle School      |
| 3. Hallie Wells Middle School            | 19. Gaithersburg Middle School    |
| 4. Clarksburg Elementary School          | 20. Emory Grove                   |
| 5. Clarksburg High School                | 21. Fields Road Elementary School |
| 6. Woodlin Elementary School             | 22. Beall Elementary School       |
| 7. Flora Singer Elementary School        | 23. Julius West Middle School     |
| 8. Spring Mill Center                    | 24. Thomas Wootton High School    |
| 9. Dr. Charles Drew Elementary School    | 25. Robert Frost High School      |
| 10. William Farquah Middle School        | 26. Travilah Elementary School    |
| 11. Rosa Parks Middle School             | 27. Jones Lane Elementary School  |
| 12. Blair Ewing Center                   | 28. Longview School               |
| 13. Lathrop Smith Environmental Center   | 29. Rock Terrace High School      |
| 14. Sequoyah Elementary School           | 30. Germantown Elementary School  |
| 15. Shady Grove Middle School            | 31. Lake Seneca Elementary School |
| 16. Captain James Daly Elementary School |                                   |

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	Date	Initials
Radon Test Kits Deployed	9/27/16	JM
Radon Test Kits Collected	9/30/16	JM
Radon Test Kits Shipped to Lab*	9/30/16	JM
Radon Test Kits Received by Lab*	10/03/16	JM

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

RADON SCREENING SURVEY – FOLLOW-UP ROBERT FROST MIDDLE SCHOOL

9201 Scott Drive, Rockville, Maryland 20850

EXECUTIVE SUMMARY

Date of Test Report:	3/8/16
Round of Testing:	Initial Follow-up Post Remediation
# Rooms Tested	9
# Rooms $\geq$ 4.0 pCi/L:	1
Low Value:	1.5
High Value:	4.6
Confirmed Rooms $\geq$ 4.0 pCi/L US EPA Action Level	2

Summary of Sampling Events  $\geq$  4.0 pCi/L

Room	Result (pCi/L) 3/14/16 (Rev 1 Initial)	Result (pCi/L) 3/8/16	Average Result (pCi/L)
102	7.8	3.9	5.9
153	6.3	4.6	5.5
156	4.0	2.2	3.1
100	4.0	2.2	3.1
103	3.3	1.5	2.4
104	3.3	2.1	2.7
105	3.8	2.0	2.9
107	3.6	missing	3.6
113	3.3	1.7	2.5



### MCPS RADON TESTING

Executive Summary: Robert Frost Middle School

Date of Test Report:	3/8/2016
Round of Testing:	Initial Follow-up Post Remediation
# Rooms Tested:	9
# Rooms $\geq$ 4.0 pCi/L:	1
Low Value:	1.5
High Value:	4.6

Rooms with results  $\geq$  4.0 pCi/L:  
Room 153 (4.6 pCi/L)

#### Project Status:

Retesting completed; use the average of the initial and re-test results in a room to determine if remediation is necessary.

Retesting completed; missing or compromised samples need re-test.



March 8, 2016

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

Re: **Radon Testing Services**  
KCI Job # 12146341.28

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

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 Robert Frost Middle School, located at 9201 Scott Drive in Rockville, Maryland 20850 (subject site).

**Scope of Services:**

KCI conducted radon testing at the subject site to evaluate indoor radon levels relative to the USEPA's recommended action level of 4.0 picocuries per Liter (pCi/L) - the level at which EPA recommends that schools take action to reduce the level. KCI conducted the radon testing in accordance with American Association of Radon Scientists and Technologists (AARST) *Protocol for Conducting Measurements of Radon and Radon Decay Products in Schools and Large Buildings*. A National Radon 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](http://www.montgomerycountymd.gov/dep/air/radon) or [www.epa.gov/radon](http://www.epa.gov/radon).

KCI visited the site on February 8, 2016 and deployed eleven (11) 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 February 11, 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:

<b>Radon Concentration</b>	<b>Room</b>	<b>Result</b>
$\geq 4.0$ pCi/L	153	4.6, 4.2(D)
$< 4.0$ pCi/L	See Attachment B	

Notes:  
D- Duplicate sample

The field blank, office blanks, 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,



James M. Mouldale  
Radon Measurement Specialist  
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

\*Office blanks were submitted at a rate of 1% for all samples deployed in Phase 8 testing. Office blanks were not submitted under each school individually.

<b>Radon Testing Results</b>		
<b>Robert Frost Middle School</b>		
<b>Test Period: 02/08/16-02/11/16</b>		
<b>Kit Number</b>	<b>Room / Area</b>	<b>Result</b>
7717293	100	2.2
7717299	102	3.9
7717297	103	1.5
7717294	104	2.1
7717239	105	2.0
7717292	113	1.7
7717295	153	4.6
7717291	156	2.2
7719624	* 107 (Missing)	-

Table Note:

\* Missing or Compromised Sample

<b>Radon Testing Results</b>		
<b>Robert Frost Middle School</b>		
<b>Test Period: 02/08/16-02/11/16</b>		
<b>Kit Number</b>	<b>QC Type</b>	<b>Result</b>
7717296	D (153)	4.2
7717298	FB (153)	< 0.3

Table Note:

\* Missing or Compromised Sample

# ATTACHMENT C

## Laboratory Analytical Results

February 25, 2016  
**\*\* LABORATORY ANALYSIS REPORT \*\***

Radon test result report for:  
**ROBERT FROST MIDDLE SCHOOL  
MAIN**

Kit #	Room Id	Started	Ended	pCi/L	Analyzed
7730693	0	@	@		
7717293	100	2016-02-08 @ 2:00 pm	2016-02-11 @ 2:00 pm	2.2 ± 0.3	2016-02-15
7717299	102	2016-02-08 @ 2:00 pm	2016-02-11 @ 2:00 pm	3.9 ± 0.4	2016-02-15
7717297	103	2016-02-08 @ 2:00 pm	2016-02-11 @ 2:00 pm	1.5 ± 0.3	2016-02-15
7717294	104	2016-02-08 @ 2:00 pm	2016-02-11 @ 2:00 pm	2.1 ± 0.3	2016-02-15
7717239	105	2016-02-08 @ 2:00 pm	2016-02-11 @ 2:00 pm	2.0 ± 0.3	2016-02-15
7719674	107	@	@		
7717292	113	2016-02-08 @ 2:00 pm	2016-02-11 @ 2:00 pm	1.7 ± 0.3	2016-02-15
7717295	153	2016-02-08 @ 2:00 pm	2016-02-11 @ 2:00 pm	4.6 ± 0.4	2016-02-15
7717296	153	2016-02-08 @ 2:00 pm	2016-02-11 @ 2:00 pm	4.2 ± 0.4	2016-02-15
7717298	153	2016-02-08 @ 2:00 pm	2016-02-11 @ 2:00 pm	< 0.3	2016-02-15
7717291	156	2016-02-08 @ 2:00 pm	2016-02-11 @ 2:00 pm	2.2 ± 0.3	2016-02-15

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February 25, 2016 **\*\* LABORATORY ANALYSIS REPORT \*\***

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Radon test result report for:

**MCPS RADON  
PHASE 8  
OFFICE BLANKS**

---

<b>Kit #</b>	<b>Room Id</b>	<b>Started</b>	<b>Ended</b>	<b>pCi/L</b>	<b>Analyzed</b>
7729754	0	2016-02-08 @ 4:00 pm	2016-02-11 @ 5:00 pm	< 0.3	2016-02-15
7729757	0	2016-02-08 @ 4:00 pm	2016-02-11 @ 5:00 pm	< 0.3	2016-02-15
7729758	0	2016-02-08 @ 4:00 pm	2016-02-11 @ 5:00 pm	< 0.3	2016-02-15

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

February 23, 2016 **LABORATORY ANALYSIS REPORT** \*\*

Radon test result report for:  
**TRANSIT- PHASE 7, 8, 9**  
**NONE**

Kit #	Room Id	Started	Ended	pCi/L	Analyzed
7734937	1	2016-02-19 @ 3:00 pm	2016-02-22 @ 11:00 am	< 0.3	2016-02-23
7734946	10	2016-02-19 @ 4:00 pm	2016-02-22 @ 11:00 am	< 0.3	2016-02-23
7734955	11	2016-02-19 @ 4:00 pm	2016-02-22 @ 11:00 am	< 0.3	2016-02-23
7734956	12	2016-02-19 @ 4:00 pm	2016-02-22 @ 11:00 am	< 0.3	2016-02-23
7734959	13	2016-02-19 @ 4:00 pm	2016-02-22 @ 11:00 am	< 0.3	2016-02-23
7734930	14	2016-02-19 @ 4:00 pm	2016-02-22 @ 11:00 am	< 0.3	2016-02-23
7734953	15	2016-02-19 @ 4:00 pm	2016-02-22 @ 11:00 am	< 0.3	2016-02-23
7734954	16	2016-02-19 @ 4:00 pm	2016-02-22 @ 11:00 am	< 0.3	2016-02-23
7734940	17	2016-02-19 @ 4:00 pm	2016-02-22 @ 11:00 am	< 0.3	2016-02-23
7734949	18	2016-02-19 @ 4:00 pm	2016-02-22 @ 11:00 am	< 0.3	2016-02-23
7734948	19	2016-02-19 @ 4:00 pm	2016-02-22 @ 11:00 am	< 0.3	2016-02-23
7734939	2	2016-02-19 @ 3:00 pm	2016-02-22 @ 11:00 am	< 0.3	2016-02-23
7734942	20	2016-02-19 @ 4:00 pm	2016-02-22 @ 11:00 am	< 0.3	2016-02-23
7734929	21	2016-02-19 @ 4:00 pm	2016-02-22 @ 11:00 am	< 0.3	2016-02-23
7734933	22	2016-02-19 @ 4:00 pm	2016-02-22 @ 11:00 am	< 0.3	2016-02-23
7734934	23	2016-02-19 @ 4:00 pm	2016-02-22 @ 11:00 am	< 0.3	2016-02-23
7734936	24	2016-02-19 @ 4:00 pm	2016-02-22 @ 11:00 am	< 0.3	2016-02-23
7734943	25	2016-02-19 @ 4:00 pm	2016-02-22 @ 11:00 am	< 0.3	2016-02-23
7734944	26	2016-02-19 @ 4:00 pm	2016-02-22 @ 11:00 am	< 0.3	2016-02-23
7734935	27	2016-02-19 @ 4:00 pm	2016-02-22 @ 11:00 am	< 0.3	2016-02-23
7734928	28	2016-02-19 @ 4:00 pm	2016-02-22 @ 11:00 am	< 0.3	2016-02-23
7734952	29	2016-02-19 @ 4:00 pm	2016-02-22 @ 11:00 am	< 0.3	2016-02-23
7734947	3	2016-02-19 @ 3:00 pm	2016-02-22 @ 11:00 am	< 0.3	2016-02-23
7734931	30	2016-02-19 @ 4:00 pm	2016-02-22 @ 11:00 am	< 0.3	2016-02-23
7734932	31	2016-02-19 @ 4:00 pm	2016-02-22 @ 11:00 am	< 0.3	2016-02-23
7718520	32	2016-02-19 @ 4:00 pm	2016-02-22 @ 11:00 am	< 0.3	2016-02-23
7718523	33	2016-02-19 @ 4:00 pm	2016-02-22 @ 11:00 am	< 0.3	2016-02-23
7718522	34	2016-02-19 @ 4:00 pm	2016-02-22 @ 11:00 am	< 0.3	2016-02-23
7718521	35	2016-02-19 @ 4:00 pm	2016-02-22 @ 11:00 am	< 0.3	2016-02-23
7734945	4	2016-02-19 @ 3:00 pm	2016-02-22 @ 11:00 am	< 0.3	2016-02-23
7734960	5	2016-02-19 @ 4:00 pm	2016-02-22 @ 11:00 am	< 0.3	2016-02-23
7734958	6	2016-02-19 @ 4:00 pm	2016-02-22 @ 11:00 am	< 0.3	2016-02-23
7734951	7	2016-02-19 @ 4:00 pm	2016-02-22 @ 11:00 am	< 0.3	2016-02-23
7734957	8	2016-02-19 @ 4:00 pm	2016-02-22 @ 11:00 am	< 0.3	2016-02-23
7734938	9	2016-02-19 @ 4:00 pm	2016-02-22 @ 11:00 am	< 0.3	2016-02-23

February  
15,  
2016

**\*\*LABORATORY ANALYSIS  
REPORT \*\***

Spike Sample Laboratory Results

Radon test result report for:  
**MCPS**

<b>Kit #</b>	<b>Room Id</b>	<b>Started</b>	<b>Ended</b>	<b>pCi/L</b>	<b>Analyzed</b>
7718273	101A	2016-01-30 @ 9:00 am	2016-02-01 @ 9:00 am	6.5 ± 0.6	2016-02-04
7718281	102B	2016-01-30 @ 9:00 am	2016-02-01 @ 9:00 am	6.4 ± 0.6	2016-02-04
7718282	103C	2016-01-30 @ 9:00 am	2016-02-01 @ 9:00 am	6.3 ± 0.6	2016-02-04
7718288	104D	2016-01-30 @ 9:00 am	2016-02-01 @ 9:00 am	6.7 ± 0.6	2016-02-04
7718289	105E	2016-01-30 @ 9:00 am	2016-02-01 @ 9:00 am	6.6 ± 0.6	2016-02-04
7718291	106F	2016-01-30 @ 9:00 am	2016-02-01 @ 9:00 am	6.5 ± 0.6	2016-02-04

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 KCF Technologies Inc. Job Number 173704

NOMINAL Conditions: Radon Conc 5.9 pCi/L Rel. Hum 45.9 % Temp. 79.0 F

Date Start: 11/30/16 Date Stop: 2/1/16 Date Start: \_\_\_\_\_ Date Stop: \_\_\_\_\_  
Time Start: 0926 Time Stop: 0926 Time Start: \_\_\_\_\_ Time Stop: \_\_\_\_\_  
Device No.'s: (6) Char. Bags - Device No.'s: \_\_\_\_\_  
7718281, 7718282, 7718291, \_\_\_\_\_  
7718288, 7718289, 7718273 \_\_\_\_\_  
ε3 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 μR/h Elevation = 820 ft**



## Radon Test Kit Chain of Custody

Project Name: MCPS Radon Phase 8

Name of Schools:

- |                          |                          |
|--------------------------|--------------------------|
| 1. Blair G. Ewing Center | 12. Jackson Road ES      |
| 2. Cedar Grove ES        | 13. Jones Lane ES        |
| 3. Clarksburg ES         | 14. Lake Seneca ES       |
| 4. Cloverly ES           | 15. Laytonsville ES      |
| 5. Cold Spring ES        | 16. Montgomery Knolls ES |
| 6. Damascus ES           | 17. North Chevy Chase ES |
| 7. Dufief ES             | 18. Oakview ES           |
| 8. East Silver Spring    | 19. Randolph Maint       |
| 9. Georgian Forest ES    | 20. Robert Frost MS      |
| 10. Germantown ES        | 21. Shady Grove Maint    |
| 11. Glenallen ES         | 22. Viers Mill ES        |

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	Date	Initials
Radon Test Kits Deployed	2/8/16	JM
Radon Test Kits Collected	2/11/16	JM
Radon Test Kits Shipped to Lab*	12/11/16	JM
Radon Test Kits Received by Lab*	12/15/16	JM

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



### MCPS RADON TESTING

Executive Summary: Robert Frost Middle School

Date of Test Report:	3/14/2016 (Rev 1)
Round of Testing:	Initial Follow-up Post Remediation
# Rooms Tested:	66
# Rooms $\geq$ 4.0 pCi/L:	4
Low Value:	< 0.3
High Value:	7.8

Rooms with results  $\geq$  4.0 pCi/L:

Room 102 (7.8 pCi/L), Room 153 (6.3 pCi/L), Room 156 (4.0 pCi/L), Room 100 (4.0 pCi/L),

Project Status:

Initial testing completed; re-test needed for results  $\geq$  4.0 pCi/L.



March 14, 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 # 12146341.22

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

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 Robert Frost Middle School, located at 9201 Scott Drive in Rockville, Maryland 20850 (subject site).

**Scope of Services:**

KCI conducted radon testing at the subject site to evaluate indoor radon levels relative to the USEPA's recommended action level of 4.0 picocuries per Liter (pCi/L) - the level at which EPA recommends that schools take action to reduce the level. KCI conducted the radon testing in accordance with American Association of Radon Scientists and Technologists (AARST) *Protocol for Conducting Measurements of Radon and Radon Decay Products in Schools and Large Buildings*. A National Radon 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](http://www.montgomerycountymd.gov/dep/air/radon) or [www.epa.gov/radon](http://www.epa.gov/radon).

KCI visited the site on December 28, 2015 and deployed seventy-eight (78) 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 December 31, 2015 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:

<b>Radon Concentration</b>	<b>Room</b>	<b>Result</b>
<b><math>\geq 4.0</math> pCi/L</b>	102	7.8
	153	6.3
	156	4.0
	100	4.0
<b><math>&lt; 4.0</math> pCi/L</b>	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,



James M. Mouldale  
Radon Measurement Specialist  
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

<b>Radon Testing Results</b>		
<b>Robert Frost MS</b>		
<b>Test Period: 12/28/15-12/31/15</b>		
<b>Kit Number</b>	<b>Room / Area</b>	<b>Result</b>
7711668	100	4.0
7711694	101	1.1
7711689	102	7.8
7711688	103	3.3
7711695	104	3.3
7711687	105	3.8
7711602	106	3.0
7711647	107	3.6
7711633	108	0.9
7711686	109	0.7
7711667	110	< 0.3
7711642	111	< 0.3
7711604	112	< 0.3
7711623	113	3.3
7711603	114	1.3
7711685	115	< 0.3
7711607	150	2.3
7711621	151	1.8
7711614	152	2.5
7711671	153	6.3
7711690	154	1.9
7711640	155	1.2
7711615	156	4.0
7711678	203	1.3
7711657	206	< 0.3
7711679	206	0.8
7711638	213	0.6
7711697	215	< 0.3
7711636	217	< 0.3
7711650	218	< 0.3
7711649	219	0.7
7711677	220	1.8
7711637	230	0.6
7711641	231	1.8
7711672	232	1.9
7711645	233	2.2
7711673	251	0.9
7711662	252	1.7
7711622	253	1.2
7711632	256	2.1
7711666	257	1.6
7711658	258	1.7
7711674	259	1.8
7711635	260	2.2
7711656	260	2.0
7711665	109C	1.2

Table Note:

\* Missing or Compromised Sample

<b>Radon Testing Results</b>		
<b>Robert Frost MS</b>		
<b>Test Period: 12/28/15-12/31/15</b>		
<b>Kit Number</b>	<b>Room / Area</b>	<b>Result</b>
7711661	109D	0.9
7711644	155B	2.7
7711660	200A	0.7
7711652	200B	0.7
7711659	200C	1.0
7711684	200D	0.7
7711629	201C	1.0
7711664	201D	< 0.3
7711663	201E	0.9
7711646	201F	0.6
7711648	201G	0.8
7711669	209A	0.7
7711698	217A	< 0.3
7711675	220A	0.8
7711653	220B	< 0.3
7711654	ASSISTANT PRINCI	0.6
7711682	CAFETERIA	< 0.3
7711696	CAFETERIA	0.8
7711655	CONFERENCE ROOM	0.7
7711643	FRONT OFFICE	< 0.3
7711699	GYM	1.8
7711700	GYM	1.3
7711630	HEALTH ROOM	0.7
7711631	HEALTH ROOM A	0.8

Table Note:

\* Missing or Compromised Sample

<b>Radon Testing Results</b>		
<b>Robert Frost MS</b>		
<b>Test Period: 12/28/15-12/31/15</b>		
<b>Kit Number</b>	<b>QC Type</b>	<b>Result</b>
7711680	D (100)	3.5
7711610	D (154)	1.9
7711670	D (209A)	< 0.3
7711676	D (220B)	1.0
7711681	FB (100)	< 0.3
7711651	FB (220B)	< 0.3
7711639	FB (CONFERENCE ROOM)	< 0.3
7710683	OB (0)	< 0.3

Table Note:

\* Missing or Compromised Sample

# ATTACHMENT C

## Laboratory Analytical Results

January 16, 2016  
**LABORATORY ANALYSIS REPORT**

Radon test result report for:  
**FROST ROBERT MS MAIN**

Kit #	Room Id	Started	Ended	pCi/L	Analyzed
7710683	0	2015-12-28 @ 5:00 pm	2015-12-31 @ 1:00 pm	< 0.3	2016-01-05
7711668	100	2015-12-28 @ 10:00 am	2015-12-31 @ 10:00 am	4.0 ± 0.6	2016-01-05
7711680	100	2015-12-28 @ 10:00 am	2015-12-31 @ 10:00 am	3.5 ± 0.5	2016-01-05
7711681	100	2015-12-28 @ 10:00 am	2015-12-31 @ 10:00 am	< 0.3	2016-01-05
7711694	101	2015-12-28 @ 10:00 am	2015-12-31 @ 10:00 am	1.1 ± 0.4	2016-01-05
7711689	102	2015-12-28 @ 10:00 am	2015-12-31 @ 10:00 am	7.8 ± 0.8	2016-01-05
7711688	103	2015-12-28 @ 10:00 am	2015-12-31 @ 10:00 am	3.3 ± 0.5	2016-01-05
7711695	104	2015-12-28 @ 10:00 am	2015-12-31 @ 10:00 am	3.3 ± 0.5	2016-01-05
7711687	105	2015-12-28 @ 10:00 am	2015-12-31 @ 10:00 am	3.8 ± 0.5	2016-01-05
7711602	106	2015-12-28 @ 10:00 am	2015-12-31 @ 10:00 am	3.0 ± 0.5	2016-01-05
7711647	107	2015-12-28 @ 10:00 am	2015-12-31 @ 10:00 am	3.6 ± 0.5	2016-01-05
7711633	108	2015-12-28 @ 10:00 am	2015-12-31 @ 10:00 am	0.9 ± 0.4	2016-01-05
7711686	109	2015-12-28 @ 10:00 am	2015-12-31 @ 10:00 am	0.7 ± 0.3	2016-01-05
7711665	109C	2015-12-28 @ 10:00 am	2015-12-31 @ 1:00 pm	1.2 ± 0.3	2016-01-05
7711661	109D	2015-12-28 @ 10:00 am	2015-12-31 @ 10:00 am	0.9 ± 0.3	2016-01-05
7711667	110	2015-12-28 @ 10:00 am	2015-12-31 @ 10:00 am	< 0.3	2016-01-05
7711642	111	2015-12-28 @ 10:00 am	2015-12-31 @ 10:00 am	< 0.3	2016-01-05
7711604	112	2015-12-28 @ 10:00 am	2015-12-31 @ 10:00 am	< 0.3	2016-01-05
7711623	113	2015-12-28 @ 10:00 am	2015-12-31 @ 10:00 am	3.3 ± 0.5	2016-01-05
7711603	114	2015-12-28 @ 10:00 am	2015-12-31 @ 10:00 am	1.3 ± 0.4	2016-01-05
7711685	115	2015-12-28 @ 10:00 am	2015-12-31 @ 10:00 am	< 0.3	2016-01-05
7711607	150	2015-12-28 @ 10:00 am	2015-12-31 @ 10:00 am	2.3 ± 0.4	2016-01-05
7711621	151	2015-12-28 @ 10:00 am	2015-12-31 @ 10:00 am	1.8 ± 0.4	2016-01-05
7711614	152	2015-12-28 @ 10:00 am	2015-12-31 @ 10:00 am	2.5 ± 0.5	2016-01-05
7711671	153	2015-12-28 @ 10:00 am	2015-12-31 @ 10:00 am	6.3 ± 0.7	2016-01-05
7711690	154	2015-12-28 @ 10:00 am	2015-12-31 @ 10:00 am	1.9 ± 0.4	2016-01-05
7711610	154	2015-12-28 @ 10:00 am	2015-12-31 @ 10:00 am	1.9 ± 0.4	2016-01-05
7711640	155	2015-12-28 @ 10:00 am	2015-12-31 @ 10:00 am	1.2 ± 0.4	2016-01-05
7711644	155B	2015-12-28 @ 10:00 am	2015-12-31 @ 10:00 am	2.7 ± 0.5	2016-01-05
7711615	156	2015-12-28 @ 11:00 am	2015-12-31 @ 10:00 am	4.0 ± 0.6	2016-01-05
7711660	200A	2015-12-28 @ 9:00 am	2015-12-31 @ 9:00 am	0.7 ± 0.3	2016-01-05
7711652	200B	2015-12-28 @ 9:00 am	2015-12-31 @ 9:00 am	0.7 ± 0.3	2016-01-05
7711659	200C	2015-12-28 @ 9:00 am	2015-12-31 @ 10:00 am	1.0 ± 0.3	2016-01-05
7711684	200D	2015-12-28 @ 9:00 am	2015-12-31 @ 9:00 am	0.7 ± 0.3	2016-01-05
7711629	201C	2015-12-28 @ 9:00 am	2015-12-31 @ 9:00 am	1.0 ± 0.4	2016-01-05
7711664	201D	2015-12-28 @ 9:00 am	2015-12-31 @ 9:00 am	< 0.3	2016-01-05
7711663	201E	2015-12-28 @ 9:00 am	2015-12-31 @ 9:00 am	0.9 ± 0.4	2016-01-05

January 16, 2016  
**LABORATORY ANALYSIS REPORT \*\***

Radon test result report for:  
**FROST ROBERT MS  
MAIN**

Kit #	Room Id	Started	Ended	pCi/L	Analyzed
7711646	201F	2015-12-28 @ 9:00 am	2015-12-31 @ 9:00 am	0.6 ± 0.4	2016-01-05
7711648	201G	2015-12-28 @ 9:00 am	2015-12-31 @ 9:00 am	0.8 ± 0.4	2016-01-05
7711678	203	2015-12-28 @ 9:00 am	2015-12-31 @ 9:00 am	1.3 ± 0.4	2016-01-05
7711657	206	2015-12-28 @ 9:00 am	2015-12-31 @ 9:00 am	< 0.3	2016-01-05
7711679	206	2015-12-28 @ 9:00 am	2015-12-31 @ 9:00 am	0.8 ± 0.3	2016-01-05
7711669	209A	2015-12-28 @ 9:00 am	2015-12-31 @ 9:00 am	0.7 ± 0.4	2016-01-05
7711670	209A	2015-12-28 @ 9:00 am	2015-12-31 @ 9:00 am	< 0.3	2016-01-05
7711638	213	2015-12-28 @ 10:00 am	2015-12-31 @ 10:00 am	0.6 ± 0.4	2016-01-05
7711697	215	2015-12-28 @ 10:00 am	2015-12-31 @ 10:00 am	< 0.3	2016-01-05
7711636	217	2015-12-28 @ 10:00 am	2015-12-31 @ 10:00 am	< 0.3	2016-01-05
7711698	217A	2015-12-28 @ 10:00 am	2015-12-31 @ 10:00 am	< 0.3	2016-01-05
7711650	218	2015-12-28 @ 10:00 am	2015-12-31 @ 10:00 am	< 0.3	2016-01-05
7711649	219	2015-12-28 @ 10:00 am	2015-12-31 @ 10:00 am	0.7 ± 0.3	2016-01-05
7711677	220	2015-12-28 @ 10:00 am	2015-12-31 @ 10:00 am	1.8 ± 0.4	2016-01-05
7711675	220A	2015-12-28 @ 10:00 am	2015-12-31 @ 10:00 am	0.8 ± 0.3	2016-01-05
7711651	220B	2015-12-28 @ 10:00 am	2015-12-31 @ 10:00 am	< 0.3	2016-01-05
7711653	220B	2015-12-28 @ 10:00 am	2015-12-31 @ 10:00 am	< 0.3	2016-01-05
7711676	220B	2015-12-28 @ 10:00 am	2015-12-31 @ 10:00 am	1.0 ± 0.4	2016-01-05
7711637	230	2015-12-28 @ 9:00 am	2015-12-31 @ 10:00 am	0.6 ± 0.3	2016-01-05
7711641	231	2015-12-28 @ 9:00 am	2015-12-31 @ 10:00 am	1.8 ± 0.4	2016-01-05
7711672	232	2015-12-28 @ 9:00 am	2015-12-31 @ 10:00 am	1.9 ± 0.4	2016-01-05
7711645	233	2015-12-28 @ 9:00 am	2015-12-31 @ 10:00 am	2.2 ± 0.4	2016-01-05
7711673	251	2015-12-28 @ 9:00 am	2015-12-31 @ 9:00 am	0.9 ± 0.4	2016-01-05
7711662	252	2015-12-28 @ 9:00 am	2015-12-31 @ 9:00 am	1.7 ± 0.4	2016-01-05
7711622	253	2015-12-28 @ 9:00 am	2015-12-31 @ 10:00 am	1.2 ± 0.4	2016-01-05
7711632	256	2015-12-28 @ 9:00 am	2015-12-31 @ 9:00 am	2.1 ± 0.4	2016-01-05
7711666	257	2015-12-28 @ 9:00 am	2015-12-31 @ 9:00 am	1.6 ± 0.4	2016-01-05
7711658	258	2015-12-28 @ 9:00 am	2015-12-31 @ 9:00 am	1.7 ± 0.4	2016-01-05
7711674	259	2015-12-28 @ 9:00 am	2015-12-31 @ 1:00 pm	1.8 ± 0.4	2016-01-05
7711656	260	2015-12-28 @ 9:00 am	2015-12-31 @ 9:00 am	2.0 ± 0.4	2016-01-05
7711635	260	2015-12-28 @ 9:00 am	2015-12-31 @ 9:00 am	2.2 ± 0.4	2016-01-05
7711654	ASSISTANT PRINCI	2015-12-28 @ 9:00 am	2015-12-31 @ 9:00 am	0.6 ± 0.3	2016-01-05
7711696	CAFETERIA	2015-12-28 @ 10:00 am	2015-12-31 @ 10:00 am	0.8 ± 0.4	2016-01-05
7711682	CAFETERIA	2015-12-28 @ 10:00 am	2015-12-31 @ 10:00 am	< 0.3	2016-01-05
7711655	CONFERENCE ROOM	2015-12-28 @ 9:00 am	2015-12-31 @ 9:00 am	0.7 ± 0.4	2016-01-05
7711639	CONFERENCE ROOM	2015-12-28 @ 9:00 am	2015-12-31 @ 9:00 am	< 0.3	2016-01-05
7711643	FRONT OFFICE	2015-12-28 @ 9:00 am	2015-12-31 @ 9:00 am	< 0.3	2016-01-05

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January\* **LABORATORY ANALYSIS**  
16, **REPORT \*\***  
2016

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Radon test result report for:  
**FROST ROBERT MS**  
**MAIN**

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<b>Kit #</b>	<b>Room Id</b>	<b>Started</b>	<b>Ended</b>	<b>pCi/L</b>	<b>Analyzed</b>
7711699	GYM	2015-12-28 @ 9:00 am	2015-12-31 @ 10:00 am	1.8 ± 0.4	2016-01-05
7711700	GYM	2015-12-28 @ 9:00 am	2015-12-31 @ 10:00 am	1.3 ± 0.4	2016-01-05
7711630	HEALTH ROOMA	2015-12-28 @ 9:00 am	2015-12-31 @ 9:00 am	0.7 ± 0.4	2016-01-05
7711631	HEALTH ROOM	2015-12-28 @ 9:00 am	2015-12-31 @ 9:00 am	0.8 ± 0.4	2016-01-05

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

January 15, 2016  
**\*\* LABORATORY ANALYSIS REPORT \*\***

Radon test result report for:  
**MCPS PHASE 3 & 4  
TRANSIT BLANKS**

Kit #	Room Id	Started	Ended	pCi/L	Analyzed
7708218	TRANSIT 4	2015-12-18 @ 12:00 pm	2015-12-21 @ 12:00 pm	< 0.3	2015-12-23
7708200	TRANSIT 1	2015-12-18 @ 12:00 pm	2015-12-21 @ 12:00 pm	< 0.3	2015-12-23
7708190	TRANSIT 10	2015-12-18 @ 12:00 pm	2015-12-21 @ 12:00 pm	< 0.3	2015-12-23
7708189	TRANSIT 11	2015-12-18 @ 12:00 pm	2015-12-21 @ 12:00 pm	< 0.3	2015-12-23
7708191	TRANSIT 12	2015-12-18 @ 12:00 pm	2015-12-21 @ 12:00 pm	< 0.3	2015-12-23
7708188	TRANSIT 13	2015-12-18 @ 12:00 pm	2015-12-21 @ 12:00 pm	< 0.3	2015-12-23
7708197	TRANSIT 14	2015-12-18 @ 12:00 pm	2015-12-21 @ 12:00 pm	< 0.3	2015-12-23
7708186	TRANSIT 15	2015-12-18 @ 12:00 pm	2015-12-21 @ 12:00 pm	< 0.3	2015-12-23
7708185	TRANSIT 16	2015-12-18 @ 12:00 pm	2015-12-21 @ 12:00 pm	< 0.3	2015-12-23
7708184	TRANSIT 17	2015-12-18 @ 12:00 pm	2015-12-21 @ 12:00 pm	< 0.3	2015-12-23
7708182	TRANSIT 18	2015-12-18 @ 12:00 pm	2015-12-21 @ 12:00 pm	< 0.3	2015-12-23
7708187	TRANSIT 18	2015-12-18 @ 12:00 pm	2015-12-21 @ 12:00 pm	< 0.3	2015-12-23
7708199	TRANSIT 2	2015-12-18 @ 12:00 pm	2015-12-21 @ 12:00 pm	< 0.3	2015-12-23
7708181	TRANSIT 20	2015-12-18 @ 12:00 pm	2015-12-21 @ 12:00 pm	< 0.3	2015-12-23
7708180	TRANSIT 21	2015-12-18 @ 12:00 pm	2015-12-21 @ 12:00 pm	< 0.3	2015-12-23
7708183	TRANSIT 22	2015-12-18 @ 12:00 pm	2015-12-21 @ 12:00 pm	< 0.3	2015-12-23
7708178	TRANSIT 23	2015-12-18 @ 12:00 pm	2015-12-21 @ 12:00 pm	< 0.3	2015-12-23
7708179	TRANSIT 24	2015-12-18 @ 12:00 pm	2015-12-21 @ 12:00 pm	< 0.3	2015-12-23
7708177	TRANSIT 25	2015-12-18 @ 12:00 pm	2015-12-21 @ 12:00 pm	< 0.3	2015-12-23
7708176	TRANSIT 26	2015-12-18 @ 12:00 pm	2015-12-21 @ 12:00 pm	< 0.3	2015-12-23
7708174	TRANSIT 27	2015-12-18 @ 12:00 pm	2015-12-21 @ 12:00 pm	< 0.3	2015-12-23
7708173	TRANSIT 28	2015-12-18 @ 12:00 pm	2015-12-21 @ 12:00 pm	< 0.3	2015-12-23
7708175	TRANSIT 29	2015-12-18 @ 12:00 pm	2015-12-21 @ 12:00 pm	< 0.3	2015-12-23
7708198	TRANSIT 3	2015-12-18 @ 12:00 pm	2015-12-21 @ 12:00 pm	< 0.3	2015-12-23
7708172	TRANSIT 30	2015-12-18 @ 12:00 pm	2015-12-21 @ 12:00 pm	< 0.3	2015-12-23
7708194	TRANSIT 5	2015-12-18 @ 12:00 pm	2015-12-21 @ 12:00 pm	< 0.3	2015-12-23
7708196	TRANSIT 6	2015-12-18 @ 12:00 pm	2015-12-21 @ 12:00 pm	< 0.3	2015-12-23
7708193	TRANSIT 7	2015-12-18 @ 12:00 pm	2015-12-21 @ 12:00 pm	< 0.3	2015-12-23
7708192	TRANSIT 8	2015-12-18 @ 12:00 pm	2015-12-21 @ 12:00 pm	< 0.3	2015-12-23
7708195	TRANSIT 9	2015-12-18 @ 12:00 pm	2015-12-21 @ 12:00 pm	< 0.3	2015-12-23

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

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**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 µR/h Elevation = 820 ft**



## Chain of Custody

Project Name: MCPS Radon Phase III

Name of Schools:

- |                       |                       |                       |
|-----------------------|-----------------------|-----------------------|
| 1. Burnt Mills ES     | 13. Georgian Frost ES | 25. Northlake Center  |
| 2. Burtonsville ES    | 14. Germantown ES     | 26. Olney ES          |
| 3. Cedar Grove ES     | 15. Goshen ES         | 27. Rosa Parks MS     |
| 4. Cloverly ES        | 16. Greencastle ES    | 28. Poolesville ES    |
| 5. Cold Spring ES     | 17. Greenwood ES      | 29. Poolesville HS    |
| 6. Damascus HS        | 18. Lake Seneca ES    | 30. Potomac ES        |
| 7. Darnestown ES      | 19. Laytonsville ES   | 31. Rock Terrace HS   |
| 8. Diamond ES         | 20. Col. E. Brooke MS | 32. Rosemary Hills ES |
| 9. Charles R. Drew ES | 21. Luxmanor ES       | 33. Carl Sandburg     |
| 10. DuFief ES         | 22. Magruder HS       | 34. Sequoyah ES       |
| 11. Thomas Edison HS  | 23. Thur. Marshall ES | 35. Stedwick ES       |
| 12. Robert Frost MS   | 24. Monocacy ES       | 36. Whetstone ES      |

	Date	Initials
Radon Test Kits Deployed	12/28/15	JM
Radon Test Kits Sampled	12/31/15	JM
Radon Test Kits Shipped to Lab*	12/31/15	JM
Radon Test Kits Received by Lab*	1/4/16	JM

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