

## School / Facility Radon Testing Report Form

School Year: **24-25**

Facility:	Montgomery Knolls Elementary School		
Address:	807 Daleview Drive		
	Silver Spring, MD 20901		
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 -or- <input type="checkbox"/> Follow-up Testing		
Testing Status:	<input checked="" type="checkbox"/> No Further Testing Needed -or- <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	77	Lowest Value (pCi/L)	< 0.3
Number of Rooms ( $\geq 4.0$ -pCi/L)	0	Highest Value (pCi/L)	1.3

**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 Lab	
Person(s) Deploying or Retrieving Test Devices and certification number		Organization/Company
Tyler McCleaf, CSP – Cert. #111004-RMP		KCI Technologies, Inc.
If noncertified individuals, the qualified measurement professional providing oversight -		

## Testing

<input checked="" type="checkbox"/> Short-Term	Length of Test (days):	3	Date of Deployment and Retrieval (mm/dd/yy):	12/10/2024
<input type="checkbox"/> Long-Term				12/13/2024
Does the test period include weekends, school breaks or holidays?				<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No
If “Yes” please explain/detail in the space below:				
Was HVAC operating under occupied conditions?				<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No
If “No” please explain/detail in the space below:				

**Testing** (continued)

Round of Testing	Detectors Deployed				
	Ground-Contact		Upper-Level(s)		Total
	Initial	Follow-Up	Initial	Follow-Up	
Test Locations <sup>1</sup>	76	0	1	0	77
Duplicates <sup>2</sup>	10	0	0	0	10
Field Blanks <sup>3</sup>	4	0	0	0	4
Grand Total					91

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		3
Trip Blanks <sup>2</sup>	1	0	1
Office Blanks <sup>3, 4</sup>	1	0	1
			5

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>Round of Testing</b>	<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"/> No <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"/> No <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"/> No <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"/> No <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:	76	0	1	0	77
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> :	0	0	0	0	0
Number of failed duplicate control locations:	0	0	0	0	0
Percentage of missing test locations for the facility <sup>4,5</sup> :	0%	0%	0%	0%	0%

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 checked="" type="checkbox"/> Yes <input 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> <b><i>If Yes, then - ‘No Further Testing Needed’ complete Conclusion section on first page.</i></b> <b><i>If No, then - ‘Follow-up Testing Required’ continue below.</i></b>	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" 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**

Table 1- Radon Testing Results		
Montgomery Knolls Elementary School		
Test Period: 12/10/2024 - 12/13/2024		
Kit Number	Room / Area	Result
11907153	1	< 0.3
11907145	2	< 0.3
11907146	2	< 0.3
11907137	5	< 0.3
11907138	5	< 0.3
11907158	7	< 0.3
11907159	8	< 0.3
11907120	101	< 0.3
11907108	102	< 0.3
11907134	104	1.3
11907133	106	0.8
11907119	108	0.6
11907106	110	0.7
11907117	111	< 0.3
11907126	112	0.9
11907118	114	< 0.3
11907155	117	0.5
11907104	120	< 0.3
11907111	120	< 0.3
11907151	121	< 0.3
11907103	122	< 0.3
11907156	123	< 0.3
11907135	124	1.1
11907149	125	0.7
11907150	125	< 0.3
11907113	127	0.5
11907101	128	< 0.3
11907122	130	< 0.3
11907114	132	< 0.3
11907121	132	< 0.3
11907144	133	1.2
11907129	138	0.6
11907172	140	< 0.3
11907161	143	< 0.3
11907165	144	< 0.3
11907162	146	< 0.3
11907160	147	< 0.3

Table 1- Radon Testing Results		
Montgomery Knolls Elementary School		
Test Period: 12/10/2024 - 12/13/2024		
Kit Number	Room / Area	Result
11907154	150	< 0.3
11907169	151	< 0.3
11907171	152	< 0.3
11907173	152	< 0.3
11907112	153	< 0.3
11907166	154	< 0.3
11907128	157	< 0.3
11907184	170	0.9
11907190	171	< 0.3
11907195	173	< 0.3
11907186	175	< 0.3
11907136	177	0.5
11907167	177	< 0.3
11907189	178	0.6
11907187	186	< 0.3
11907188	186	< 0.3
11907177	188	0.5
11907178	188	< 0.3
11907185	190	< 0.3
11907175	192	< 0.3
11907174	194	< 0.3
11907168	196	< 0.3
11907157	215	< 0.3
11907109	100B	< 0.3
11907110	100C	< 0.3
11907148	100F	< 0.3
11907139	100H	< 0.3
11907147	100I	< 0.3
11907142	100J	< 0.3
11907140	100K	< 0.3
11907141	100K	< 0.3
11907115	102A	0.5
11907102	103B	< 0.3
11907116	103B	< 0.3
11907123	103C	< 0.3
11907132	103C	< 0.3
11907105	118A	< 0.3

Table 1- Radon Testing Results		
Montgomery Knolls Elementary School		
Test Period: 12/10/2024 - 12/13/2024		
Kit Number	Room / Area	Result
11907127	118C	< 0.3
11907152	118C	< 0.3
11907143	118E	< 0.3
11907180	170C	1.1
11907181	170D	1.0
11907182	170E	0.7
11907183	170E	1.2
11907179	170F	0.6
11907170	GYM	< 0.3
11907176	GYM	< 0.3
11907130	GYM OFFICE	1.0
11907107	MAIN OFFICE	< 0.3
11907124	MEDIA	< 0.3
11907125	MEDIA	0.7
11907163	MPR	< 0.3
11907164	MPR	< 0.3
11907131	WORKROOM	< 0.3

[illegible]

Table 3 - QC Radon Testing Results			
Montgomery Knolls Elementary School			
Test Period: 12/10/2024 - 12/13/2024			
Kit Number	QC Type	Room / Area	Result
11907145	FB	2	< 0.3
11907137	D	5	< 0.3
11907104	D	120	< 0.3
11907150	FB	125	< 0.3
11907121	D	132	< 0.3
11907171	D	152	< 0.3
11907136	D	177	0.5
11907187	FB	186	< 0.3
11907178	D	188	< 0.3
11907140	D	100K	< 0.3
11907116	FB	103B	< 0.3
11907123	D	103C	< 0.3
11907127	D	118C	< 0.3
11907182	D	170E	0.7
11907194	OB	OFFICE BLANK	< 0.3
11907193	TB	TRAVEL BLANK	< 0.3



Table 3a - Duplicate Worksheet / Data Validation										
Montgomery Knolls Elementary School										
Test Period: 12/09/2024 - 12/13/2024										
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
11907141	11907140	100K	0.3	0.3	✓	0.6	PASS	0.3	<1-pCi/L	✓
11907132	11907123	103C	0.3	0.3	✓	0.6	PASS	0.3	<1-pCi/L	✓
11907111	11907104	120	0.3	0.3	✓	0.6	PASS	0.3	<1-pCi/L	✓
11907114	11907121	132	0.3	0.3	✓	0.6	PASS	0.3	<1-pCi/L	✓
11907173	11907171	152	0.3	0.3	✓	0.6	PASS	0.3	<1-pCi/L	✓
11907138	11907137	5	0.3	0.3	✓	0.6	PASS	0.3	<1-pCi/L	✓
11907138	11907182	170E	1.2	0.7	✓	1.4	PASS	1.0	<1-pCi/L	✓
11907177	11907178	188	0.5	0.3	✓	0.6	PASS	0.4	<1-pCi/L	✓
11907167	11907136	177	0.5	0.3	✓	0.6	PASS	0.4	<1-pCi/L	✓
<b>NOTES:</b> 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

[illegible]

# **Attachment 2:**

## **Laboratory Reports**

Radon test result report for:**MONTGOMERY KNOLLS ES  
MAIN**

Kit #	Room Id	Started	Ended	pCi/L	Analyzed
11907153	1	2024-12-10 @ 11:00 am	2024-12-13 @ 10:00 am	< 0.3	2024-12-16
11907161	143	2024-12-10 @ 11:00 am	2024-12-13 @ 10:00 am	< 0.3	2024-12-16
11907162	146	2024-12-10 @ 11:00 am	2024-12-13 @ 10:00 am	< 0.3	2024-12-16
11907160	147	2024-12-10 @ 11:00 am	2024-12-13 @ 10:00 am	< 0.3	2024-12-16
11907154	150	2024-12-10 @ 11:00 am	2024-12-13 @ 10:00 am	< 0.3	2024-12-16
11907169	151	2024-12-10 @ 11:00 am	2024-12-13 @ 10:00 am	< 0.3	2024-12-16
11907112	153	2024-12-10 @ 11:00 am	2024-12-13 @ 10:00 am	< 0.3	2024-12-16
11907128	157	2024-12-10 @ 11:00 am	2024-12-13 @ 10:00 am	< 0.3	2024-12-16
11907184	170	2024-12-10 @ 11:00 am	2024-12-13 @ 10:00 am	0.9 ± 0.3	2024-12-16
11907180	170C	2024-12-10 @ 12:00 pm	2024-12-13 @ 10:00 am	1.1 ± 0.3	2024-12-16
11907181	170D	2024-12-10 @ 11:00 am	2024-12-13 @ 10:00 am	1.0 ± 0.3	2024-12-16
11907182	170E	2024-12-10 @ 11:00 am	2024-12-13 @ 10:00 am	0.7 ± 0.3	2024-12-16
11907183	170E	2024-12-10 @ 11:00 am	2024-12-13 @ 10:00 am	1.2 ± 0.3	2024-12-16
11907179	170F	2024-12-10 @ 12:00 pm	2024-12-13 @ 10:00 am	0.6 ± 0.3	2024-12-16
11907190	171	2024-12-10 @ 12:00 pm	2024-12-13 @ 10:00 am	< 0.3	2024-12-16
11907195	173	2024-12-10 @ 12:00 pm	2024-12-13 @ 10:00 am	< 0.3	2024-12-16
11907186	175	2024-12-10 @ 12:00 pm	2024-12-13 @ 10:00 am	< 0.3	2024-12-16
11907167	177	2024-12-10 @ 12:00 pm	2024-12-13 @ 10:00 am	< 0.3	2024-12-16
11907136	177	2024-12-10 @ 12:00 pm	2024-12-13 @ 10:00 am	0.5 ± 0.3	2024-12-16
11907189	178	2024-12-10 @ 12:00 pm	2024-12-13 @ 10:00 am	0.6 ± 0.3	2024-12-16
11907187	186	2024-12-10 @ 12:00 pm	2024-12-13 @ 10:00 am	< 0.3	2024-12-16
11907188	186	2024-12-10 @ 12:00 pm	2024-12-13 @ 10:00 am	< 0.3	2024-12-16
11907177	188	2024-12-10 @ 12:00 pm	2024-12-13 @ 10:00 am	0.5 ± 0.3	2024-12-16
11907178	188	2024-12-10 @ 12:00 pm	2024-12-13 @ 10:00 am	< 0.3	2024-12-16
11907185	190	2024-12-10 @ 12:00 pm	2024-12-13 @ 10:00 am	< 0.3	2024-12-16
11907175	192	2024-12-10 @ 12:00 pm	2024-12-13 @ 10:00 am	< 0.3	2024-12-16
11907174	194	2024-12-10 @ 12:00 pm	2024-12-13 @ 10:00 am	< 0.3	2024-12-16
11907168	196	2024-12-10 @ 12:00 pm	2024-12-13 @ 10:00 am	< 0.3	2024-12-16
11907145	2	2024-12-10 @ 11:00 am	2024-12-13 @ 10:00 am	< 0.3	2024-12-16
11907146	2	2024-12-10 @ 11:00 am	2024-12-13 @ 10:00 am	< 0.3	2024-12-16
11907138	5	2024-12-10 @ 11:00 am	2024-12-13 @ 10:00 am	< 0.3	2024-12-16
11907137	5	2024-12-10 @ 11:00 am	2024-12-13 @ 10:00 am	< 0.3	2024-12-16
11907158	7	2024-12-10 @ 11:00 am	2024-12-13 @ 10:00 am	< 0.3	2024-12-16
11907159	8	2024-12-10 @ 11:00 am	2024-12-13 @ 10:00 am	< 0.3	2024-12-16
11907176	GYM	2024-12-10 @ 11:00 am	2024-12-13 @ 10:00 am	< 0.3	2024-12-16
11907170	GYM	2024-12-10 @ 11:00 am	2024-12-13 @ 10:00 am	< 0.3	2024-12-16
11907130	GYM OFFICE	2024-12-10 @ 11:00 am	2024-12-13 @ 10:00 am	1.0 ± 0.3	2024-12-16

Radon test result report for:**MONTGOMERY KNOLLS Y  
MAIN**

Kit #	Room Id	Started	Ended	pCi/L	Analyzed
11907109	100B	2024-12-10 @ 10:00 am	2024-12-13 @ 10:00 am	< 0.3	2024-12-16
11907110	100C	2024-12-10 @ 10:00 am	2024-12-13 @ 10:00 am	< 0.3	2024-12-16
11907148	100F	2024-12-10 @ 10:00 am	2024-12-13 @ 10:00 am	< 0.3	2024-12-16
11907139	100H	2024-12-10 @ 10:00 am	2024-12-13 @ 10:00 am	< 0.3	2024-12-16
11907147	100I	2024-12-10 @ 10:00 am	2024-12-13 @ 10:00 am	< 0.3	2024-12-16
11907142	100J	2024-12-10 @ 10:00 am	2024-12-13 @ 10:00 am	< 0.3	2024-12-16
11907141	100K	2024-12-10 @ 10:00 am	2024-12-13 @ 10:00 am	< 0.3	2024-12-16
11907140	100K	2024-12-10 @ 10:00 am	2024-12-13 @ 10:00 am	< 0.3	2024-12-16
11907120	101	2024-12-10 @ 10:00 am	2024-12-13 @ 10:00 am	< 0.3	2024-12-16
11907108	102	2024-12-10 @ 10:00 am	2024-12-13 @ 10:00 am	< 0.3	2024-12-16
11907115	102A	2024-12-10 @ 10:00 am	2024-12-13 @ 10:00 am	0.5 ± 0.3	2024-12-16
11907116	103B	2024-12-10 @ 10:00 am	2024-12-13 @ 10:00 am	< 0.3	2024-12-16
11907102	103B	2024-12-10 @ 10:00 am	2024-12-13 @ 10:00 am	< 0.3	2024-12-16
11907132	103C	2024-12-10 @ 10:00 am	2024-12-13 @ 10:00 am	< 0.3	2024-12-16
11907123	103C	2024-12-10 @ 10:00 am	2024-12-13 @ 10:00 am	< 0.3	2024-12-16
11907134	104	2024-12-10 @ 10:00 am	2024-12-13 @ 10:00 am	1.3 ± 0.3	2024-12-16
11907133	106	2024-12-10 @ 10:00 am	2024-12-13 @ 10:00 am	0.8 ± 0.3	2024-12-16
11907119	108	2024-12-10 @ 10:00 am	2024-12-13 @ 10:00 am	0.6 ± 0.3	2024-12-16
11907106	110	2024-12-10 @ 10:00 am	2024-12-13 @ 10:00 am	0.7 ± 0.3	2024-12-16
11907117	111	2024-12-10 @ 10:00 am	2024-12-13 @ 10:00 am	< 0.3	2024-12-16
11907126	112	2024-12-10 @ 10:00 am	2024-12-13 @ 10:00 am	0.9 ± 0.3	2024-12-16
11907118	114	2024-12-10 @ 11:00 am	2024-12-13 @ 10:00 am	< 0.3	2024-12-16
11907155	117	2024-12-10 @ 11:00 am	2024-12-13 @ 10:00 am	0.5 ± 0.3	2024-12-16
11907105	118A	2024-12-10 @ 11:00 am	2024-12-13 @ 10:00 am	< 0.3	2024-12-16
11907127	118C	2024-12-10 @ 11:00 am	2024-12-13 @ 10:00 am	< 0.3	2024-12-16
11907152	118C	2024-12-10 @ 11:00 am	2024-12-13 @ 10:00 am	< 0.3	2024-12-16
11907143	118E	2024-12-10 @ 11:00 am	2024-12-13 @ 10:00 am	< 0.3	2024-12-16
11907111	120	2024-12-10 @ 11:00 am	2024-12-13 @ 10:00 am	< 0.3	2024-12-16
11907104	120	2024-12-10 @ 11:00 am	2024-12-13 @ 10:00 am	< 0.3	2024-12-16
11907151	121	2024-12-10 @ 11:00 am	2024-12-13 @ 10:00 am	< 0.3	2024-12-16
11907103	122	2024-12-10 @ 11:00 am	2024-12-13 @ 10:00 am	< 0.3	2024-12-16
11907156	123	2024-12-10 @ 11:00 am	2024-12-13 @ 10:00 am	< 0.3	2024-12-16
11907135	124	2024-12-10 @ 11:00 am	2024-12-13 @ 10:00 am	1.1 ± 0.3	2024-12-16
11907149	125	2024-12-10 @ 11:00 am	2024-12-13 @ 10:00 am	0.7 ± 0.3	2024-12-16
11907150	125	2024-12-10 @ 11:00 am	2024-12-13 @ 10:00 am	< 0.3	2024-12-16
11907113	127	2024-12-10 @ 11:00 am	2024-12-13 @ 10:00 am	0.5 ± 0.3	2024-12-16
11907101	128	2024-12-10 @ 11:00 am	2024-12-13 @ 10:00 am	< 0.3	2024-12-16

December 16, 2024

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

Radon test result report for:

**MONTGOMERY KNOLLS Y  
MAIN**

Kit #	Room Id	Started	Ended	pCi/L	Analyzed
11907122	130	2024-12-10 @ 11:00 am	2024-12-13 @ 10:00 am	< 0.3	2024-12-16
11907121	132	2024-12-10 @ 11:00 am	2024-12-13 @ 10:00 am	< 0.3	2024-12-16
11907114	132	2024-12-10 @ 11:00 am	2024-12-13 @ 10:00 am	< 0.3	2024-12-16
11907144	133	2024-12-10 @ 11:00 am	2024-12-13 @ 10:00 am	1.2 ± 0.3	2024-12-16
11907129	138	2024-12-10 @ 11:00 am	2024-12-13 @ 10:00 am	0.6 ± 0.3	2024-12-16
11907172	140	2024-12-10 @ 11:00 am	2024-12-13 @ 10:00 am	< 0.3	2024-12-16
11907165	144	2024-12-10 @ 11:00 am	2024-12-13 @ 10:00 am	< 0.3	2024-12-16
11907171	152	2024-12-10 @ 11:00 am	2024-12-13 @ 10:00 am	< 0.3	2024-12-16
11907173	152	2024-12-10 @ 11:00 am	2024-12-13 @ 10:00 am	< 0.3	2024-12-16
11907166	154	2024-12-10 @ 11:00 am	2024-12-13 @ 10:00 am	< 0.3	2024-12-16
11907157	215	2024-12-10 @ 11:00 am	2024-12-13 @ 10:00 am	< 0.3	2024-12-16
11907107	MAIN OFFICE	2024-12-10 @ 10:00 am	2024-12-13 @ 10:00 am	< 0.3	2024-12-16
11907125	MEDIA	2024-12-10 @ 10:00 am	2024-12-13 @ 10:00 am	0.7 ± 0.3	2024-12-16
11907124	MEDIA	2024-12-10 @ 10:00 am	2024-12-13 @ 10:00 am	< 0.3	2024-12-16
11907163	MPR	2024-12-10 @ 11:00 am	2024-12-13 @ 10:00 am	< 0.3	2024-12-16
11907164	MPR	2024-12-10 @ 11:00 am	2024-12-13 @ 10:00 am	< 0.3	2024-12-16
11907131	WORKROOM	2024-12-10 @ 10:00 am	2024-12-13 @ 10:00 am	< 0.3	2024-12-16

December 16, 2024

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

Radon test result report for:

**OFFICE  
MAIN**

Kit #	Room Id	Started	Ended	pCi/L	Analyzed
11477899	O	2024-12-09 @ 10:00 am	2024-12-12 @ 11:00 am	< 0.3	2024-12-16
11907194	O	2024-12-10 @ 10:00 am	2024-12-13 @ 11:00 am	< 0.3	2024-12-16

December 16, 2024

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

Radon test result report for:

**TRAVEL  
MAIN**

Kit #	Room Id	Started	Ended	pCi/L	Analyzed
11482789	T	2024-12-09 @ 10:00 am	2024-12-12 @ 11:00 am	< 0.3	2024-12-16
11907193	T	2024-12-10 @ 10:00 am	2024-12-13 @ 11:00 am	< 0.3	2024-12-16



# 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

December 23, 2024

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

Radon test result report for:

**SK  
MAIN**

Kit #	Room Id	Started	Ended	pCi/L	Analyzed
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



## Radon Test Kit Chain of Custody

Project Name: MCPS Radon – Testing December 10<sup>th</sup> – December 13<sup>th</sup>, 2024

Name of Schools:

1. Jackson Road ES
2. John F. Kennedy HS

3. Montgomery Knolls ES

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	Date	Initials
Radon Test Kits Deployed	12/10/2024	BMM
Radon Test Kits Collected	12/13/2024	BMM
Radon Test Kits Shipped to Lab*	12/13/2024	BMM
Radon Test Kits Received by Lab*	12/16/2024	BMM

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

### MCPS RADON TESTING – EXECUTIVE SUMMARY

Site Name	Montgomery Knolls Elementary School
Date of Test Report	2/16/2023
Round of Testing	Initial Follow-up Post Remediation 2 Year Testing 5 Year Testing HVAC Upgrade Window Replacement New Addition New Facility
# Rooms Tested	1
# Rooms $\geq 4.0$ pCi/L	0
Lowest Value	<0.3 pCi/L
Highest Value	0.8 pCi/L

Project Status:

1. Post mitigation testing completed.



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936 RIDGEBROOK ROAD • SPARKS, MD 21152 • 410-316-7800 • (FAX) 410-316-7935

February 16, 2023

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

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

Location: Montgomery Knolls Elementary School  
807 Daleview Drive  
Silver Spring, MD 20901

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 Montgomery Knolls Elementary School, located at 807 Daleview Dr. Dr. Silver Spring, MD 20901 (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 10, 2023 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.

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 13, 2023 to retrieve the radon sampling test kits. KCI shipped all radon tests via overnight delivery to Accustar Labs - MA for analysis by gamma-ray spectroscopy.

Accustar Labs - MA is a NRSB certified analytical laboratory for radon analysis (certification #ARL0017) located at 2 Saber Way, Ward Hill, MA 01835.

### **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 temperatures ranged from the 26°F to the mid 56°F. Maximum sustained winds ranged from 0-21 miles per hour. Average humidity was around 68% with .09 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		
Montgomery Knolls ES		
Test Period: 01/10/2023 - 01/13/2023		
Kit Number	Room / Area	Result
11287545	192	< 0.3
11287546	192	0.8
11287551	192	< 0.3

Table 2- Radon Testing Results			
Montgomery Knolls ES			
Test Period: 01/10/23 - 01/13/23			
Kit Number	QC Type	Room / Area	Result
11287551	D	292	< 0.3
11287545	FB	192	< 0.3
11285162	OB	OFFICE BLANK	< 0.3
11284899	TB	TRAVEL BLANK	< 0.3



## ATTACHMENT C

### Laboratory Analytical Results

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January 16, 2023

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

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Radon test result report for:

**MAIN**

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Kit #	Room Id	Started	Ended	pCi/L	Analyzed
11287545	192	2023-01-10 @ 1:00 pm	2023-01-13 @ 11:00 am	< 0.3	2023-01-16
11287546	192	2023-01-10 @ 1:00 pm	2023-01-13 @ 11:00 am	0.8 ± 0.3	2023-01-16
11287551	192	2023-01-10 @ 1:00 pm	2023-01-13 @ 11:00 am	< 0.3	2023-01-16

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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 KC1 TECHNOLOGIES, INC Job Number 208343

NOMINAL Conditions: Radon Conc 34.7 pCi/L Rel. Hum 49.4 % Temp. 69.6 F

Date Start: 12/24/22 Date Stop: 12/27/22 Date Start: \_\_\_\_\_ Date Stop: \_\_\_\_\_

Time Start: 0810 Time Stop: 0810 Time Start: \_\_\_\_\_ Time Stop: \_\_\_\_\_

Device No.'s: (5) CHAR BAGS - Device No.'s: \_\_\_\_\_

11285109, 11285110, 11285101 \_\_\_\_\_

THRU 11285103 \_\_\_\_\_

BY 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 29, 2022

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

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Radon test result report for:

**OFFICE  
MAIN**

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Kit #	Room Id	Started	Ended	pCi/L	Analyzed
11285110	SK1	2022-12-24 @ 8:00 am	2022-12-27 @ 8:00 am	31.7 ± 2.5	2022-12-29
11285101	SK2	2022-12-24 @ 8:00 am	2022-12-27 @ 8:00 am	30.1 ± 2.4	2022-12-29
11285103	SK3	2022-12-24 @ 8:00 am	2022-12-27 @ 8:00 am	34.0 ± 2.7	2022-12-29
11285102	SK4	2022-12-24 @ 8:00 am	2022-12-27 @ 8:00 am	30.9 ± 2.5	2022-12-29
11285109	SK5	2022-12-24 @ 8:00 am	2022-12-27 @ 8:00 am	32.0 ± 2.6	2022-12-29

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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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## Radon Test Kit Chain of Custody

Project Name: MCPS Radon – Week 1 January Schools

Name of Schools:

1. Woodfield ES
2. Montgomery Village MS
3. Albert Einstein HS
4. Garrett Park Annex
5. Garrett Park ES
6. Kensington-Parkwood ES
7. Silver Creek MS
8. Stephen Knolls School
9. Highland View ES
10. MacDonald Knolls ECC
11. Montgomery Knolls ES
12. Rock Terrace HS

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	Date	Initials
Radon Test Kits Deployed	01/10/2023	BMM
Radon Test Kits Collected	01/13/2023	BMM
Radon Test Kits Shipped to Lab*	01/13/2023	BMM
Radon Test Kits Received by Lab*	01/17/2023	BMM

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



### **MCPS RADON TESTING – EXECUTIVE SUMMARY**

Site Name	Montgomery Knolls Elementary School
Date of Test Report	6/1/2022
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	1
Lowest Value	<0.3 pCi/L
Highest Value	4.0 pCi/L

### **Project Status**

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

Mitigation needed - Room 192



June 1, 2022

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

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

Location: Montgomery Knolls Elementary School  
807 Daleview Dr.  
Silver Spring, MD 20901

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 Montgomery Knolls Elementary School, located at 807 Daleview Dr. Silver Spring, MD 20901 (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 April 19, 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 April 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 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 60°Fs to the mid 80°Fs. Maximum sustained winds ranged from 0-30 miles per hour. Average humidity was around 49% with 0.03 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	192	4.0
<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		
Montgomery Knolls ES RT		
Test Period: 04/19/2022 - 04/22/2022		
Kit Number	Room / Area	Result
11132031	192	1.1
11139391	192	4.0
11139399	192	3.6

Table 2- Radon Testing Results			
Montgomery Knolls ES RT			
Test Period: 04/19/2022 - 04/22/2022			
Kit Number	QC Type	Room / Area	Result
11139391	D	192	4.0
11132031	FB	192	1.1
11139882	OB	OFFICE BLANK	< 0.3
11139881	TB	TRAVEL BLANK	< 0.3



## ATTACHMENT C

### Laboratory Analytical Results

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April 25, 2022

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

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Radon test result report for:

---

Kit #	Room Id	Started	Ended	pCi/L	Analyzed
11132031	192	2022-04-19 @ 12:00 pm	2022-04-22 @ 9:00 am	1.1 ± 0.3	2022-04-25

---

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

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April 25, 2022

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

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Radon test result report for:

---

Kit #	Room Id	Started	Ended	pCi/L	Analyzed
11139391	192	2022-04-19 @ 12:00 pm	2022-04-22 @ 9:00 am	4.0 ± 0.4	2022-04-25
11139399	192	2022-04-19 @ 12:00 pm	2022-04-22 @ 9:00 am	3.6 ± 0.3	2022-04-25

---

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 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 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).

---

Kit #	Room Id	Started	Ended	pCi/L	Analyzed
11139367	SK1	2022-03-18 @ 7:00 am	2022-03-21 @ 7:00 am	$25.9 \pm 2.1$	2022-03-30
11139368	SK2	2022-03-18 @ 7:00 am	2022-03-21 @ 7:00 am	$23.9 \pm 2.0$	2022-03-30
11139371	SK3	2022-03-18 @ 7:00 am	2022-03-21 @ 7:00 am	$25.7 \pm 2.1$	2022-03-30
11139710	SK4	2022-03-18 @ 7:00 am	2022-03-21 @ 7:00 am	$26.4 \pm 2.1$	2022-03-30
11139717	SK5	2022-03-18 @ 7:00 am	2022-03-21 @ 7:00 am	$24.6 \pm 2.0$	2022-03-30

---

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



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ENGINEERS • PLANNERS • SCIENTISTS • CONSTRUCTION MANAGERS  
Corporate Office: 936 Ridgebrook road • Sparks, Maryland 21152 • 410-316-7800 • (Fax) 410-316-7935

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## Radon Test Kit Chain of Custody

Project Name: MCPS Radon – April 2022 Schools – Retesting

Name of Schools:

1. Pine Crest ES
2. Montgomery Knolls ES
3. Poolesville ES
4. Cloverly ES

---

	Date	Initials
Radon Test Kits Deployed	04/19/2022	BMM
Radon Test Kits Collected	04/22/2022	BMM
Radon Test Kits Shipped to Lab*	04/22/2022	BMM
Radon Test Kits Received by Lab*	04/25/2022	BMM

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

### MCPS RADON TESTING – EXECUTIVE SUMMARY

Site Name	Montgomery Knolls Elementary School
Date of Test Report	4/26/2022
Round of Testing	Initial Follow-up Post Remediation 2 Year Testing 5 Year Testing HVAC Upgrade Window Replacement New Addition New Facility
# Rooms Tested	77
# Rooms $\geq$ 4.0 pCi/L	1
Lowest Value	<0.3 pCi/L
Highest Value	4.5 pCi/L

Project Status:

Initial testing completed; Missing, elevated or compromised samples need re-sampling



April 26, 2022

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

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

Location: Montgomery Knolls Elementary School  
807 Daleview Dr.  
Silver Spring, MD 20901

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 Montgomery Knolls ES, located at 807 Daleview Dr. Silver Spring, MD 20901 (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 1, 2022 and deployed eighty nine (89) activated charcoal (AC) radon test kits. KCI deployed radon test kits in all frequently-occupied ground contact rooms, and other areas, (if applicable) in accordance with AARST guidance.

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

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

KCI returned to the site on March 4, 2022 to retrieve the radon sampling test kits. KCI shipped all radon tests via overnight delivery to Airchek, Inc. for analysis by gamma-ray spectroscopy. Airchek, Inc. is a

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

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

These tests represent:

- Follow-up to biennial post-mitigation testing.

These tests were conducted to:

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

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

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

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

KCI also compiled weather data for the testing period and conducted observations of relevant field conditions. During the test period, weather records indicate low temperatures were in the 20s and high temperatures ranged from the high 50s to the low 60s Fahrenheit. Maximum sustained winds ranged from 9-17 miles per hour. Average humidity was around 40% with 0 inches of precipitation (rain) was recorded during testing period.

### **Results:**

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

The results of the radon test analysis indicated the following:

Radon Concentration	Room	Result
≥4.0 pCi/L	192	4.5
<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		
Montgomery Knolls ES		
Test Period: 03/01/2022 - 03/04/2022		
Kit Number	Room / Area	Result
11132550	1	< 0.3
11132549	2	0.6
11132569	5	< 0.3
11132564	7	0.5
11132570	8	< 0.3
11132504	100	0.8
11132518	101	0.6
11132510	102	< 0.3
11132526	103	< 0.3
11132514	104	1.1
11132522	106	1.3
11132521	108	0.6
11132528	110	0.9
11132537	111	< 0.3
11132551	111	< 0.3
11132527	112	1.3
11132535	114	< 0.3
11132552	117	< 0.3
11132544	120	< 0.3
11132553	121	0.6
11132530	122	0.7
11132538	123	< 0.3
11132554	124	1.7
11132560	125	1.0
11132548	127	< 0.3
11132561	127	0.6
11132559	128	< 0.3
11132545	130	1.0
11132546	132	0.8
11132503	133	1.6
11132562	138	1.0
11132567	138	0.6
11132568	140	0.9
11132515	143	1.1
11132516	143	0.9
11132555	144	1.1
11132508	146	0.9
11132507	147	1.3
11132573	149	0.6
11132584	149	0.7
11132523	150	0.9
11132531	151	1.3

Table 1- Radon Testing Results		
Montgomery Knolls ES		
Test Period: 03/01/2022 - 03/04/2022		
Kit Number	Room / Area	Result
11132532	151	1.6
11132556	152	0.7
11132576	153	1.0
11132577	153	0.5
11132563	154	1.3
11132575	157	1.1
11132557	170	1.1
11132571	171	0.7
11132572	171	< 0.3
11132580	173	0.8
11132581	175	1.1
11132592	177	1.2
11132574	178	0.6
11132583	186	< 0.3
11132582	188	0.7
11132579	190	1.5
11132589	190	1.5
11132586	192	4.5
11132591	194	1.0
11132585	196	1.0
11132524	233	< 0.3
11132509	100B	0.6
11132505	100C	0.8
11132513	100D	1.1
11132511	100F	1.1
11132506	100H	0.8
11132519	100I	0.6
11132512	100J	0.7
11132517	100K	0.6
11132520	100K	< 0.3
11132501	102A	< 0.3
11132525	103B	< 0.3
11132533	103C	< 0.3
11132534	103C	< 0.3
11132529	118A	0.7
11132536	118A	< 0.3
11132542	118C	< 0.3
11132543	118C	< 0.3
11132541	118E	< 0.3
11132565	170C	1.0
11132578	170C	1.1
11132566	170D	1.2

Table 1- Radon Testing Results		
Montgomery Knolls ES		
Test Period: 03/01/2022 - 03/04/2022		
Kit Number	Room / Area	Result
11132558	170E	1.3
11132502	170F	0.6
11132539	GYM	0.7
11132540	GYM	0.8
11132547	GYM OFFICE	2.2

Table 2- Radon Testing Results			
Montgomery Knolls ES			
Test Period: 03/01/2022 - 03/04/2022			
Kit Number	QC Type	Room / Area	Result
11132520	D	100k	< 0.3
11132533	FB	103c	< 0.3
11132529	D	118a	0.7
11132537	D	111	< 0.3
11132548	FB	127	< 0.3
11132567	D	138	0.6
11132515	D	143	1.1
11132577	FB	153	0.5
11132532	D	151	1.6
11132565	D	170c	1.0
11132572	FB	171	< 0.3
11132579	D	190	1.5
11130861	OB	OFFICE BLANK	< 0.3
11130854	TB	TRAVEL BLANK	< 0.3



## ATTACHMENT C

### Laboratory Analytical Results

Radon test result report for:**MONTGOMERY KNOLLS ES  
MAIN**

Kit #	Room Id	Started	Ended	pCi/L	Analyzed
11132550	001	2022-03-01 @ 10:00 am	2022-03-04 @ 10:00 am	< 0.3	2022-03-07
11132549	002	2022-03-01 @ 10:00 am	2022-03-04 @ 10:00 am	0.6 ± 0.3	2022-03-07
11132569	005	2022-03-01 @ 10:00 am	2022-03-04 @ 10:00 am	< 0.3	2022-03-07
11132564	007	2022-03-01 @ 10:00 am	2022-03-04 @ 10:00 am	0.5 ± 0.3	2022-03-08
11132570	008	2022-03-01 @ 10:00 am	2022-03-04 @ 10:00 am	< 0.3	2022-03-07
11132504	100	2022-03-01 @ 9:00 am	2022-03-04 @ 9:00 am	0.8 ± 0.3	2022-03-07
11132509	100B	2022-03-01 @ 9:00 am	2022-03-04 @ 9:00 am	0.6 ± 0.3	2022-03-08
11132505	100C	2022-03-01 @ 9:00 am	2022-03-04 @ 9:00 am	0.8 ± 0.3	2022-03-08
11132513	100D	2022-03-01 @ 9:00 am	2022-03-04 @ 9:00 am	1.1 ± 0.3	2022-03-08
11132511	100F	2022-03-01 @ 9:00 am	2022-03-04 @ 9:00 am	1.1 ± 0.3	2022-03-08
11132506	100H	2022-03-01 @ 9:00 am	2022-03-04 @ 9:00 am	0.8 ± 0.3	2022-03-08
11132519	100I	2022-03-01 @ 9:00 am	2022-03-04 @ 11:00 am	0.6 ± 0.3	2022-03-07
11132512	100J	2022-03-01 @ 9:00 am	2022-03-04 @ 11:00 am	0.7 ± 0.3	2022-03-07
11132520	100K	2022-03-01 @ 9:00 am	2022-03-04 @ 9:00 am	< 0.3	2022-03-08
11132517	100K	2022-03-01 @ 9:00 am	2022-03-04 @ 9:00 am	0.6 ± 0.3	2022-03-08
11132518	101	2022-03-01 @ 9:00 am	2022-03-04 @ 9:00 am	0.6 ± 0.3	2022-03-08
11132510	102	2022-03-01 @ 9:00 am	2022-03-04 @ 9:00 am	< 0.3	2022-03-07
11132501	102A	2022-03-01 @ 9:00 am	2022-03-04 @ 9:00 am	< 0.3	2022-03-08
11132526	103	2022-03-01 @ 9:00 am	2022-03-04 @ 9:00 am	< 0.3	2022-03-08
11132525	103B	2022-03-01 @ 9:00 am	2022-03-04 @ 9:00 am	< 0.3	2022-03-07
11132533	103C	2022-03-01 @ 9:00 am	2022-03-04 @ 11:00 am	< 0.3	2022-03-07
11132534	103C	2022-03-01 @ 9:00 am	2022-03-04 @ 11:00 am	< 0.3	2022-03-07
11132514	104	2022-03-01 @ 9:00 am	2022-03-04 @ 9:00 am	1.1 ± 0.3	2022-03-08
11132522	106	2022-03-01 @ 9:00 am	2022-03-04 @ 9:00 am	1.3 ± 0.3	2022-03-07
11132521	108	2022-03-01 @ 9:00 am	2022-03-04 @ 9:00 am	0.6 ± 0.3	2022-03-07
11132528	110	2022-03-01 @ 9:00 am	2022-03-04 @ 9:00 am	0.9 ± 0.3	2022-03-08
11132537	111	2022-03-01 @ 9:00 am	2022-03-04 @ 9:00 am	< 0.3	2022-03-07
11132551	111	2022-03-01 @ 9:00 am	2022-03-04 @ 9:00 am	< 0.3	2022-03-07
11132527	112	2022-03-01 @ 9:00 am	2022-03-04 @ 9:00 am	1.3 ± 0.3	2022-03-07
11132535	114	2022-03-01 @ 9:00 am	2022-03-04 @ 9:00 am	< 0.3	2022-03-07
11132552	117	2022-03-01 @ 9:00 am	2022-03-04 @ 10:00 am	< 0.3	2022-03-07
11132529	118A	2022-03-01 @ 9:00 am	2022-03-04 @ 9:00 am	0.7 ± 0.3	2022-03-07
11132536	118A	2022-03-01 @ 9:00 am	2022-03-04 @ 9:00 am	< 0.3	2022-03-07
11132543	118C	2022-03-01 @ 9:00 am	2022-03-04 @ 9:00 am	< 0.3	2022-03-07
11132542	118C	2022-03-01 @ 9:00 am	2022-03-04 @ 9:00 am	< 0.3	2022-03-07
11132541	118E	2022-03-01 @ 9:00 am	2022-03-04 @ 9:00 am	< 0.3	2022-03-08
11132544	120	2022-03-01 @ 9:00 am	2022-03-04 @ 9:00 am	< 0.3	2022-03-07



Radon test result report for:**MONTGOMERY KNOLLS ES  
MAIN**

Kit #	Room Id	Started	Ended	pCi/L	Analyzed
11132553	121	2022-03-01 @ 9:00 am	2022-03-04 @ 10:00 am	0.6 ± 0.3	2022-03-07
11132530	122	2022-03-01 @ 9:00 am	2022-03-04 @ 10:00 am	0.7 ± 0.3	2022-03-07
11132538	123	2022-03-01 @ 9:00 am	2022-03-04 @ 10:00 am	< 0.3	2022-03-07
11132554	124	2022-03-01 @ 9:00 am	2022-03-04 @ 10:00 am	1.7 ± 0.3	2022-03-08
11132560	125	2022-03-01 @ 9:00 am	2022-03-04 @ 10:00 am	1.0 ± 0.3	2022-03-07
11132561	127	2022-03-01 @ 9:00 am	2022-03-04 @ 10:00 am	0.6 ± 0.3	2022-03-07
11132548	127	2022-03-01 @ 9:00 am	2022-03-04 @ 10:00 am	< 0.3	2022-03-07
11132559	128	2022-03-01 @ 9:00 am	2022-03-04 @ 10:00 am	< 0.3	2022-03-08
11132545	130	2022-03-01 @ 9:00 am	2022-03-04 @ 10:00 am	1.0 ± 0.3	2022-03-07
11132546	132	2022-03-01 @ 9:00 am	2022-03-04 @ 10:00 am	0.8 ± 0.3	2022-03-07
11132503	133	2022-03-01 @ 9:00 am	2022-03-04 @ 10:00 am	1.6 ± 0.3	2022-03-07
11132562	138	2022-03-01 @ 10:00 am	2022-03-04 @ 10:00 am	1.0 ± 0.3	2022-03-07
11132567	138	2022-03-01 @ 10:00 am	2022-03-04 @ 10:00 am	0.6 ± 0.3	2022-03-08
11132568	140	2022-03-01 @ 10:00 am	2022-03-04 @ 10:00 am	0.9 ± 0.3	2022-03-07
11132515	143	2022-03-01 @ 10:00 am	2022-03-04 @ 10:00 am	1.1 ± 0.3	2022-03-07
11132516	143	2022-03-01 @ 10:00 am	2022-03-04 @ 10:00 am	0.9 ± 0.3	2022-03-07
11132555	144	2022-03-01 @ 10:00 am	2022-03-04 @ 10:00 am	1.1 ± 0.3	2022-03-07
11132508	146	2022-03-01 @ 10:00 am	2022-03-04 @ 10:00 am	0.9 ± 0.3	2022-03-07
11132507	147	2022-03-01 @ 10:00 am	2022-03-04 @ 10:00 am	1.3 ± 0.3	2022-03-07
11132584	149	2022-03-01 @ 10:00 am	2022-03-04 @ 10:00 am	0.7 ± 0.3	2022-03-08
11132573	149	2022-03-01 @ 10:00 am	2022-03-04 @ 10:00 am	0.6 ± 0.3	2022-03-08
11132523	150	2022-03-01 @ 10:00 am	2022-03-04 @ 10:00 am	0.9 ± 0.3	2022-03-07
11132532	151	2022-03-01 @ 10:00 am	2022-03-04 @ 10:00 am	1.6 ± 0.3	2022-03-08
11132531	151	2022-03-01 @ 10:00 am	2022-03-04 @ 10:00 am	1.3 ± 0.3	2022-03-08
11132556	152	2022-03-01 @ 10:00 am	2022-03-04 @ 10:00 am	0.7 ± 0.3	2022-03-07
11132576	153	2022-03-01 @ 10:00 am	2022-03-04 @ 10:00 am	1.0 ± 0.3	2022-03-07
11132577	153	2022-03-01 @ 10:00 am	2022-03-04 @ 10:00 am	0.5 ± 0.3	2022-03-07
11132563	154	2022-03-01 @ 10:00 am	2022-03-04 @ 10:00 am	1.3 ± 0.3	2022-03-07
11132575	157	2022-03-01 @ 10:00 am	2022-03-04 @ 10:00 am	1.1 ± 0.3	2022-03-07
11132557	170	2022-03-01 @ 10:00 am	2022-03-04 @ 10:00 am	1.1 ± 0.3	2022-03-07
11132578	170C	2022-03-01 @ 10:00 am	2022-03-04 @ 10:00 am	1.1 ± 0.3	2022-03-07
11132565	170C	2022-03-01 @ 10:00 am	2022-03-04 @ 10:00 am	1.0 ± 0.3	2022-03-07
11132566	170D	2022-03-01 @ 10:00 am	2022-03-04 @ 10:00 am	1.2 ± 0.3	2022-03-07
11132558	170E	2022-03-01 @ 10:00 am	2022-03-04 @ 10:00 am	1.3 ± 0.3	2022-03-07
11132502	170F	2022-03-01 @ 10:00 am	2022-03-04 @ 10:00 am	0.6 ± 0.3	2022-03-07
11132572	171	2022-03-01 @ 10:00 am	2022-03-04 @ 10:00 am	< 0.3	2022-03-07
11132571	171	2022-03-01 @ 10:00 am	2022-03-04 @ 10:00 am	0.7 ± 0.3	2022-03-07

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March 8, 2022

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

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Radon test result report for:

**MONTGOMERY KNOLLS ES  
MAIN**

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Kit #	Room Id	Started	Ended	pCi/L	Analyzed
11132580	173	2022-03-01 @ 10:00 am	2022-03-04 @ 11:00 am	0.8 ± 0.3	2022-03-07
11132581	175	2022-03-01 @ 10:00 am	2022-03-04 @ 11:00 am	1.1 ± 0.3	2022-03-07
11132592	177	2022-03-01 @ 10:00 am	2022-03-04 @ 11:00 am	1.2 ± 0.3	2022-03-07
11132574	178	2022-03-01 @ 10:00 am	2022-03-04 @ 10:00 am	0.6 ± 0.3	2022-03-07
11132583	186	2022-03-01 @ 10:00 am	2022-03-04 @ 10:00 am	< 0.3	2022-03-08
11132582	188	2022-03-01 @ 10:00 am	2022-03-04 @ 10:00 am	0.7 ± 0.3	2022-03-07
11132579	190	2022-03-01 @ 10:00 am	2022-03-04 @ 11:00 am	1.5 ± 0.3	2022-03-07
11132589	190	2022-03-01 @ 10:00 am	2022-03-04 @ 11:00 am	1.5 ± 0.3	2022-03-08
11132586	192	2022-03-01 @ 10:00 am	2022-03-04 @ 11:00 am	4.5 ± 0.4	2022-03-07
11132591	194	2022-03-01 @ 10:00 am	2022-03-04 @ 11:00 am	1.0 ± 0.3	2022-03-08
11132585	196	2022-03-01 @ 10:00 am	2022-03-04 @ 11:00 am	1.0 ± 0.3	2022-03-07
11132524	233	2022-03-01 @ 10:00 am	2022-03-04 @ 10:00 am	< 0.3	2022-03-08
11132540	GYM	2022-03-01 @ 10:00 am	2022-03-04 @ 10:00 am	0.8 ± 0.3	2022-03-07
11132539	GYM	2022-03-01 @ 10:00 am	2022-03-04 @ 10:00 am	0.7 ± 0.3	2022-03-08
11132547	GYM OFFICE	2022-03-01 @ 10:00 am	2022-03-04 @ 10:00 am	2.2 ± 0.3	2022-03-08

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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 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: \_\_\_\_\_

\_\_\_\_\_

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\_\_\_\_\_

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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Kit #	Room Id	Started	Ended	pCi/L	Analyzed
11139367	SK1	2022-03-18 @ 7:00 am	2022-03-21 @ 7:00 am	25.9 $\pm$ 2.1	2022-03-30
11139368	SK2	2022-03-18 @ 7:00 am	2022-03-21 @ 7:00 am	23.9 $\pm$ 2.0	2022-03-30
11139371	SK3	2022-03-18 @ 7:00 am	2022-03-21 @ 7:00 am	25.7 $\pm$ 2.1	2022-03-30
11139710	SK4	2022-03-18 @ 7:00 am	2022-03-21 @ 7:00 am	26.4 $\pm$ 2.1	2022-03-30
11139717	SK5	2022-03-18 @ 7:00 am	2022-03-21 @ 7:00 am	24.6 $\pm$ 2.0	2022-03-30

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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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March 30, 2022

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

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Radon test result report for:

**RSH**  
**MAIN**

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Kit #	Room Id	Started	Ended	pCi/L	Analyzed
11139726	BASEMENT	2022-03-20 @ 8:00 am	2022-03-23 @ 7:00 am	0.9 ± 0.5	2022-03-30
11139725	DINING	2022-03-20 @ 8:00 am	2022-03-23 @ 7:00 am	< 0.3	2022-03-30

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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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ENGINEERS • PLANNERS • SCIENTISTS • CONSTRUCTION MANAGERS  
Corporate Office: 936 Ridgebrook road • Sparks , Maryland 21152 • 410-316-7800 • (Fax) 410-316-7935

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## Radon Test Kit Chain of Custody

**Project Name:** MCPS Radon – March 2022 Schools

**Name of Schools:**

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

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

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



### **MCPS RADON TESTING - EXECUTIVE SUMMARY**

Site Name	Montgomery Knolls Elementary School
Date of Report	2/21/2020
Round of Testing	Initial Follow-up Post Remediation <b>2 year testing</b> 5 year testing <b>HVAC Upgrade</b> Window Replacement New Addition New Facility
# of Rooms Tested	69
# Rooms $\geq 4.0$ pCi/L	0
Lowest Value	<0.3 pCi/L
Highest Value	1.9 pCi/L

### **Project Status**

Current Project Status at this time: Testing Complete; no further action.



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2/21/2020

Mr. Richard Cox, MS  
Environmental Team Leader  
Montgomery County Public Schools  
Division of Maintenance  
Gaithersburg, Maryland 20879

Re: Radon Testing Services

KCI Job #12146341126

**Location: Montgomery Knolls Elementary School**

807 Daleview Drive  
Silver Spring, Maryland 20901

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 Montgomery Knolls Elementary School, located at 807 Daleview Drive in Silver Spring, Maryland 20901 (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 Provider (certification #111004 RT) 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 1/7/2020 and deployed eighty-six (86) 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.



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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 sixty (60) 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 1/10/2020 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 National Radon Safety Board (NRSB) radon measurement provider and is a 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 and HVAC upgrade.

These tests were conducted to:

- Evaluate radon concentrations following the installation of a new HVAC system.

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 upper-20s and high temperatures were in the mid-50s. Maximum sustained winds ranged from 10-23 miles per hour. Average humidity was around 64%. 0.32 inches of precipitation (rain) 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). 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:

<b>Radon Concentration</b>	<b>Room</b>	<b>Result</b>
$\geq 4.0$ pCi/L	None	N/A
$\leq 4.0$ pCi/L	See Attachment B	See Attachment B

<b>Quality Control Samples</b>	
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 410-316-7800.

Sincerely,

Mr. Tyler P. McCleaf  
Radon Measurement Provider  
111004 RT

KCI Technologies, Inc.

Attachments:

A- Floor Plan with Test Locations

B - Tables 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 Chek, Inc.

D- Duplicate

FB- Field Blank

KCI- KCI Technologies, Inc.

OB- Office Blank

PM- Project Manager

QC- Quality Control

Table 1- Radon Testing Results		
Montgomery Knolls Elementary School		
Test Period: 1/7/2020-1/10/2020		
Kit Number	Room / Area	Result
9341101	101	< 0.3
9341102	104	< 0.3
9341103	104	< 0.3
9341104	106	< 0.3
9341105	108	< 0.3
9341106	110	< 0.3
9341107	112	< 0.3
9341108	103	< 0.3
9341109	103	< 0.3
9341110	111	< 0.3
9341111	113	< 0.3
9341112	114	< 0.3
9341113	114	< 0.3
9341114	118A	< 0.3
9341115	118A	< 0.3
9341116	118C	< 0.3
9341117	118E	< 0.3
9341118	118C	< 0.3
9341119	120	< 0.3
9341120	117	< 0.3
9341121	121	< 0.3
9341122	122	< 0.3
9341123	122	< 0.3
9341124	123	< 0.3
9341125	124	1
9341126	128	< 0.3
9341127	125	1.9
9341128	130	< 0.3
9341129	132	< 0.3
9341130	127	< 0.3
9341131	138	0.6
9341132	140	< 0.3
9341133	140	< 0.3
9341134	144	< 0.3
9341135	146	< 0.3
9341136	146	< 0.3
9341137	143	< 0.3
9341138	150	< 0.3
9341139	147	< 0.3
9341140	211	< 0.3
9341141	133	0.6
9341142	149	< 0.3

9341143	149	< 0.3
9341144	149	0.6
9341145	178	0.9
9341146	154	0.6
9341147	152	< 0.3
9341148	151	0.6
9341149	153	< 0.3
9341150	157	< 0.3
9341151	168	0.8
9341152	168	0.9
9341153	168	< 0.3
9341154	168A	1.3
9341155	168A	< 0.3
9341156	170	< 0.3
9341157	170E	< 0.3
9341158	170D	< 0.3
9341159	170C	0.6
9341160	186	< 0.3
9341161	188	< 0.3
9341162	171	< 0.3
9341163	171	< 0.3
9341164	190	< 0.3
9341165	192	0.7
9341166	173	< 0.3
9341167	175	< 0.3
9341168	194	< 0.3
9341169	196	< 0.3
9341170	177	< 0.3
9341171	103C	< 0.3
9341172	100	< 0.3
9341173	100	< 0.3
9341174	102B	< 0.3
9341175	102B	< 0.3
9341176	102A	< 0.3
9341177	102C	< 0.3
9341178	100C	< 0.3
9341179	100D	< 0.3
9341180	100F	< 0.3
9341181	100H	< 0.3
9341182	100K	< 0.3
9341183	100K	< 0.3
9341184	100J	< 0.3
9341185	100I	< 0.3
9341186	100B	< 0.3
9348310	OFFICE BLANK	<0.3

Table 2- Radon Testing Results			
Montgomery Knolls Elementary School			
Test Period: 1/7/2020-1/10/2020			
Kit Number	QC Type	Room / Area	Result
9341103	D	104	<0.3
9341113	D	114	<0.3
9341115	FB	118A	<0.3
9341123	D	122	<0.3
9341133	D	140	<0.3
9341135	FB	146	<0.3
9341143	D	149	<0.3
9341153	D	168	<0.3
9341155	FB	168A	<0.3
9341163	D	171	<0.3
9341173	D	100	<0.3
9341175	FB	102B	<0.3
9341183	D	100K	<0.3
9348319	TRANSIT BLANK	NA	<0.3
9348320	TRANSIT BLANK	NA	<0.3
9348313	TRANSIT BLANK	NA	<0.3





# ATTACHMENT C

## Laboratory Analytical Results

Radon test result report for:

MCPS - Spike Sample Lab Results. Measured values are satisfactory, i.e., within  $\pm 25\%$  of the chamber's reference value (25.7 pCi/L).

Kit #	Room Id	Started	Ended	pCi/L	Analyzed
9340067	N/A	2019-12-21 @ 9:00 am	2019-12-23 @ 9:00 am	25.1 $\pm$ 2.4 D	2020-01-03
9340035	N/A	2019-12-21 @ 8:00 am	2019-12-23 @ 8:00 am	22.5 $\pm$ 2.3 D	2020-01-03
9340003	N/A	2019-12-21 @ 8:00 am	2019-12-23 @ 8:00 am	25.2 $\pm$ 2.4 D	2020-01-03
9340089	N/A	2019-12-21 @ 9:00 am	2019-12-23 @ 9:00 am	23.3 $\pm$ 2.3 D	2020-01-03
9340072	N/A	2019-12-21 @ 9:00 am	2019-12-23 @ 9:00 am	18.3 $\pm$ 2.0 D	2020-01-03
9340040	N/A	2019-12-21 @ 8:00 am	2019-12-23 @ 8:00 am	27.3 $\pm$ 2.6 D	2020-01-03
9340008	N/A	2019-12-21 @ 8:00 am	2019-12-23 @ 8:00 am	24.8 $\pm$ 2.5 D	2020-01-03
9340094	N/A	2019-12-21 @ 9:00 am	2019-12-23 @ 9:00 am	24.7 $\pm$ 2.5 D	2020-01-03
9340099	N/A	2019-12-21 @ 9:00 am	2019-12-23 @ 9:00 am	27.5 $\pm$ 2.6 D	2020-01-03
9340077	N/A	2019-12-21 @ 9:00 am	2019-12-23 @ 9:00 am	25.2 $\pm$ 2.5 D	2020-01-03
9340045	N/A	2019-12-21 @ 8:00 am	2019-12-23 @ 8:00 am	24.7 $\pm$ 2.4 D	2020-01-03
9340013	N/A	2019-12-21 @ 8:00 am	2019-12-23 @ 8:00 am	25.9 $\pm$ 2.6 D	2020-01-03
9340018	N/A	2019-12-21 @ 8:00 am	2019-12-23 @ 8:00 am	29.1 $\pm$ 2.8 D	2020-01-03
9341704	N/A	2019-12-21 @ 9:00 am	2019-12-23 @ 9:00 am	25.1 $\pm$ 2.4 D	2020-01-03
9340050	N/A	2019-12-21 @ 8:00 am	2019-12-23 @ 8:00 am	27.2 $\pm$ 2.6 D	2020-01-03
9340023	N/A	2019-12-21 @ 8:00 am	2019-12-23 @ 8:00 am	28.2 $\pm$ 2.7 D	2020-01-03
9341709	N/A	2019-12-21 @ 9:00 am	2019-12-23 @ 9:00 am	25.5 $\pm$ 2.4 D	2020-01-03
9340055	N/A	2019-12-21 @ 8:00 am	2019-12-23 @ 8:00 am	27.8 $\pm$ 2.6 D	2020-01-03
9340060	N/A	2019-12-21 @ 8:00 am	2019-12-23 @ 8:00 am	27.3 $\pm$ 2.5 D	2020-01-03
9340028	N/A	2019-12-21 @ 8:00 am	2019-12-23 @ 8:00 am	23.9 $\pm$ 2.3 D	2020-01-03
9341714	N/A	2019-12-21 @ 9:00 am	2019-12-23 @ 9:00 am	28.3 $\pm$ 2.7 D	2020-01-03
9340082	N/A	2019-12-21 @ 9:00 am	2019-12-23 @ 9:00 am	26.4 $\pm$ 2.6 D	2020-01-03
9340065	N/A	2019-12-21 @ 9:00 am	2019-12-23 @ 9:00 am	24.2 $\pm$ 2.4 D	2020-01-03
9340033	N/A	2019-12-21 @ 8:00 am	2019-12-23 @ 8:00 am	26.2 $\pm$ 2.5 D	2020-01-03
9341719	N/A	2019-12-21 @ 9:00 am	2019-12-23 @ 9:00 am	26.7 $\pm$ 2.5 D	2020-01-03
9340001	N/A	2019-12-21 @ 8:00 am	2019-12-23 @ 8:00 am	26.3 $\pm$ 2.5 D	2020-01-03
9340087	N/A	2019-12-21 @ 9:00 am	2019-12-23 @ 9:00 am	24.8 $\pm$ 2.4 D	2020-01-03
9340070	N/A	2019-12-21 @ 9:00 am	2019-12-23 @ 9:00 am	19.5 $\pm$ 2.4 D	2020-01-03
9340038	N/A	2019-12-21 @ 8:00 am	2019-12-23 @ 8:00 am	24.7 $\pm$ 2.3 D	2020-01-03
9340006	N/A	2019-12-21 @ 8:00 am	2019-12-23 @ 8:00 am	25.2 $\pm$ 2.4 D	2020-01-03
9340092	N/A	2019-12-21 @ 9:00 am	2019-12-23 @ 9:00 am	31.4 $\pm$ 2.8 D	2020-01-03
9340097	N/A	2019-12-21 @ 9:00 am	2019-12-23 @ 9:00 am	26.7 $\pm$ 2.5 D	2020-01-03
9340075	N/A	2019-12-21 @ 9:00 am	2019-12-23 @ 9:00 am	29.6 $\pm$ 2.6 D	2020-01-03
9340043	N/A	2019-12-21 @ 8:00 am	2019-12-23 @ 8:00 am	28.1 $\pm$ 2.6 D	2020-01-03
9340011	N/A	2019-12-21 @ 8:00 am	2019-12-23 @ 8:00 am	26.8 $\pm$ 2.5 D	2020-01-03
9340016	N/A	2019-12-21 @ 8:00 am	2019-12-23 @ 8:00 am	23.2 $\pm$ 2.4 D	2020-01-03
9341702	N/A	2019-12-21 @ 9:00 am	2019-12-23 @ 9:00 am	26.8 $\pm$ 2.5 D	2020-01-03

Radon test result report for:

MCPS - Spike Sample Lab Results. Measured values are satisfactory, i.e., within  $\pm 25\%$  of the chamber's reference value (25.7 pCi/L).

Kit #	Room Id	Started	Ended	pCi/L	Analyzed
9340048	N/A	2019-12-21 @ 8:00 am	2019-12-23 @ 8:00 am	25.5 $\pm$ 2.4 D	2020-01-03
9340021	N/A	2019-12-21 @ 8:00 am	2019-12-23 @ 8:00 am	26.7 $\pm$ 2.6 D	2020-01-03
9341707	N/A	2019-12-21 @ 9:00 am	2019-12-23 @ 9:00 am	25.8 $\pm$ 2.4 D	2020-01-03
9340053	N/A	2019-12-21 @ 8:00 am	2019-12-23 @ 8:00 am	25.8 $\pm$ 2.5 D	2020-01-03
9340058	N/A	2019-12-21 @ 8:00 am	2019-12-23 @ 8:00 am	28.5 $\pm$ 2.7 D	2020-01-03
9340026	N/A	2019-12-21 @ 8:00 am	2019-12-23 @ 8:00 am	25.9 $\pm$ 2.4 D	2020-01-03
9341712	N/A	2019-12-21 @ 9:00 am	2019-12-23 @ 9:00 am	24.3 $\pm$ 2.4 D	2020-01-03
9340080	N/A	2019-12-21 @ 9:00 am	2019-12-23 @ 9:00 am	25.1 $\pm$ 2.4 D	2020-01-03
9340063	N/A	2019-12-21 @ 9:00 am	2019-12-23 @ 9:00 am	25.8 $\pm$ 2.5 D	2020-01-03
9340031	N/A	2019-12-21 @ 8:00 am	2019-12-23 @ 8:00 am	24.9 $\pm$ 2.4 D	2020-01-03
9341717	N/A	2019-12-21 @ 9:00 am	2019-12-23 @ 9:00 am	25.7 $\pm$ 2.4 D	2020-01-03
9340085	N/A	2019-12-21 @ 9:00 am	2019-12-23 @ 9:00 am	26.9 $\pm$ 2.5 D	2020-01-03
9340068	N/A	2019-12-21 @ 9:00 am	2019-12-23 @ 9:00 am	26.2 $\pm$ 2.5 D	2020-01-03
9340036	N/A	2019-12-21 @ 8:00 am	2019-12-23 @ 8:00 am	23.6 $\pm$ 2.3 D	2020-01-03
9340004	N/A	2019-12-21 @ 8:00 am	2019-12-23 @ 8:00 am	26.9 $\pm$ 2.6 D	2020-01-03
9340090	N/A	2019-12-21 @ 9:00 am	2019-12-23 @ 9:00 am	26.3 $\pm$ 2.5 D	2020-01-03
9340073	N/A	2019-12-21 @ 9:00 am	2019-12-23 @ 9:00 am	26.8 $\pm$ 2.5 D	2020-01-03
9340041	N/A	2019-12-21 @ 8:00 am	2019-12-23 @ 8:00 am	25.6 $\pm$ 2.4 D	2020-01-03
9340009	N/A	2019-12-21 @ 8:00 am	2019-12-23 @ 8:00 am	24.1 $\pm$ 2.4 D	2020-01-03
9340095	N/A	2019-12-21 @ 9:00 am	2019-12-23 @ 9:00 am	25.2 $\pm$ 2.5 D	2020-01-03
9340100	N/A	2019-12-21 @ 9:00 am	2019-12-23 @ 9:00 am	24.5 $\pm$ 2.4 D	2020-01-03
9340078	N/A	2019-12-21 @ 9:00 am	2019-12-23 @ 9:00 am	25.0 $\pm$ 2.4 D	2020-01-03
9340046	N/A	2019-12-21 @ 8:00 am	2019-12-23 @ 8:00 am	28.0 $\pm$ 2.6 D	2020-01-03
9340014	N/A	2019-12-21 @ 8:00 am	2019-12-23 @ 8:00 am	21.8 $\pm$ 2.8 D	2020-01-03
9340019	N/A	2019-12-21 @ 8:00 am	2019-12-23 @ 8:00 am	26.0 $\pm$ 2.5 D	2020-01-03
9341705	N/A	2019-12-21 @ 9:00 am	2019-12-23 @ 9:00 am	27.8 $\pm$ 2.6 D	2020-01-03
9340051	N/A	2019-12-21 @ 8:00 am	2019-12-23 @ 8:00 am	25.5 $\pm$ 2.4 D	2020-01-03
9340056	N/A	2019-12-21 @ 8:00 am	2019-12-23 @ 8:00 am	27.7 $\pm$ 2.6 D	2020-01-03
9340024	N/A	2019-12-21 @ 8:00 am	2019-12-23 @ 8:00 am	28.3 $\pm$ 2.5 D	2020-01-03
9341710	N/A	2019-12-21 @ 9:00 am	2019-12-23 @ 9:00 am	24.2 $\pm$ 2.3 D	2020-01-03
9340061	N/A	2019-12-21 @ 9:00 am	2019-12-23 @ 9:00 am	28.9 $\pm$ 2.6 D	2020-01-03
9340029	N/A	2019-12-21 @ 8:00 am	2019-12-23 @ 8:00 am	23.0 $\pm$ 2.3 D	2020-01-03
9341715	N/A	2019-12-21 @ 9:00 am	2019-12-23 @ 9:00 am	27.0 $\pm$ 2.5 D	2020-01-03
9340083	N/A	2019-12-21 @ 9:00 am	2019-12-23 @ 9:00 am	24.9 $\pm$ 2.4 D	2020-01-03
9340066	N/A	2019-12-21 @ 9:00 am	2019-12-23 @ 9:00 am	25.1 $\pm$ 2.4 D	2020-01-03
9340034	N/A	2019-12-21 @ 8:00 am	2019-12-23 @ 8:00 am	26.4 $\pm$ 2.5 D	2020-01-03
9341720	N/A	2019-12-21 @ 9:00 am	2019-12-23 @ 9:00 am	25.3 $\pm$ 2.5 D	2020-01-03

Radon test result report for:

MCPS - Spike Sample Lab Results. Measured values are satisfactory, i.e., within  $\pm 25\%$  of the chamber's reference value (25.7 pCi/L).

Kit #	Room Id	Started	Ended	pCi/L	Analyzed
9340002	N/A	2019-12-21 @ 8:00 am	2019-12-23 @ 8:00 am	25.7 $\pm$ 2.5 D	2020-01-03
9340088	N/A	2019-12-21 @ 9:00 am	2019-12-23 @ 9:00 am	26.4 $\pm$ 2.5 D	2020-01-03
9340071	N/A	2019-12-21 @ 9:00 am	2019-12-23 @ 9:00 am	24.9 $\pm$ 2.4 D	2020-01-03
9340039	N/A	2019-12-21 @ 8:00 am	2019-12-23 @ 8:00 am	26.9 $\pm$ 2.5 D	2020-01-03
9340007	N/A	2019-12-21 @ 8:00 am	2019-12-23 @ 8:00 am	26.9 $\pm$ 2.4 D	2020-01-03
9340093	N/A	2019-12-21 @ 9:00 am	2019-12-23 @ 9:00 am	25.1 $\pm$ 2.5 D	2020-01-03
9340098	N/A	2019-12-21 @ 9:00 am	2019-12-23 @ 9:00 am	26.8 $\pm$ 2.5 D	2020-01-03
9340076	N/A	2019-12-21 @ 9:00 am	2019-12-23 @ 9:00 am	25.1 $\pm$ 2.5 D	2020-01-03
9340044	N/A	2019-12-21 @ 8:00 am	2019-12-23 @ 8:00 am	25.2 $\pm$ 2.5 D	2020-01-03
9340012	N/A	2019-12-21 @ 8:00 am	2019-12-23 @ 8:00 am	22.5 $\pm$ 2.2 D	2020-01-03
9340017	N/A	2019-12-21 @ 8:00 am	2019-12-23 @ 8:00 am	25.3 $\pm$ 2.5 D	2020-01-03
9341703	N/A	2019-12-21 @ 9:00 am	2019-12-23 @ 9:00 am	26.0 $\pm$ 2.5 D	2020-01-03
9340049	N/A	2019-12-21 @ 8:00 am	2019-12-23 @ 8:00 am	26.0 $\pm$ 2.5 D	2020-01-03
9340022	N/A	2019-12-21 @ 8:00 am	2019-12-23 @ 8:00 am	28.6 $\pm$ 2.6 D	2020-01-03
9341708	N/A	2019-12-21 @ 9:00 am	2019-12-23 @ 9:00 am	28.8 $\pm$ 2.8 D	2020-01-03
9340054	N/A	2019-12-21 @ 8:00 am	2019-12-23 @ 8:00 am	26.8 $\pm$ 2.5 D	2020-01-03
9340059	N/A	2019-12-21 @ 8:00 am	2019-12-23 @ 8:00 am	26.5 $\pm$ 2.6 D	2020-01-03
9340027	N/A	2019-12-21 @ 8:00 am	2019-12-23 @ 8:00 am	26.6 $\pm$ 2.5 D	2020-01-03
9341713	N/A	2019-12-21 @ 9:00 am	2019-12-23 @ 9:00 am	26.5 $\pm$ 2.5 D	2020-01-03
9340081	N/A	2019-12-21 @ 9:00 am	2019-12-23 @ 9:00 am	18.4 $\pm$ 2.1 D	2020-01-03
9340064	N/A	2019-12-21 @ 9:00 am	2019-12-23 @ 9:00 am	26.5 $\pm$ 2.5 D	2020-01-03
9340032	N/A	2019-12-21 @ 8:00 am	2019-12-23 @ 8:00 am	26.1 $\pm$ 2.4 D	2020-01-03
9341718	N/A	2019-12-21 @ 9:00 am	2019-12-23 @ 9:00 am	23.7 $\pm$ 2.4 D	2020-01-03
9340086	N/A	2019-12-21 @ 9:00 am	2019-12-23 @ 9:00 am	26.9 $\pm$ 2.6 D	2020-01-03
9340069	N/A	2019-12-21 @ 9:00 am	2019-12-23 @ 9:00 am	25.6 $\pm$ 2.5 D	2020-01-03
9340037	N/A	2019-12-21 @ 8:00 am	2019-12-23 @ 8:00 am	28.4 $\pm$ 2.6 D	2020-01-03
9340005	N/A	2019-12-21 @ 8:00 am	2019-12-23 @ 8:00 am	???? DIF1	2020-01-03
9340091	N/A	2019-12-21 @ 9:00 am	2019-12-23 @ 9:00 am	26.5 $\pm$ 2.5 D	2020-01-03
9340096	N/A	2019-12-21 @ 9:00 am	2019-12-23 @ 9:00 am	26.2 $\pm$ 2.5 D	2020-01-03
9340074	N/A	2019-12-21 @ 9:00 am	2019-12-23 @ 9:00 am	27.7 $\pm$ 2.5 D	2020-01-03
9340042	N/A	2019-12-21 @ 8:00 am	2019-12-23 @ 8:00 am	26.6 $\pm$ 2.5 D	2020-01-03
9340010	N/A	2019-12-21 @ 8:00 am	2019-12-23 @ 8:00 am	27.5 $\pm$ 2.5 D	2020-01-03
9341701	N/A	2019-12-21 @ 9:00 am	2019-12-23 @ 9:00 am	22.9 $\pm$ 2.3 D	2020-01-03
9340047	N/A	2019-12-21 @ 8:00 am	2019-12-23 @ 8:00 am	26.7 $\pm$ 2.5 D	2020-01-03
9340015	N/A	2019-12-21 @ 8:00 am	2019-12-23 @ 8:00 am	25.4 $\pm$ 2.5 D	2020-01-03
9340020	N/A	2019-12-21 @ 8:00 am	2019-12-23 @ 8:00 am	24.1 $\pm$ 2.4 D	2020-01-03
9341706	N/A	2019-12-21 @ 9:00 am	2019-12-23 @ 9:00 am	31.0 $\pm$ 2.7 D	2020-01-03

January 3, 2020

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

Radon test result report for:

MCPS - Spike Sample Lab Results. Measured values are satisfactory, i.e., within  $\pm 25\%$  of the chamber's reference value (25.7 pCi/L).

Kit #	Room Id	Started	Ended	pCi/L	Analyzed
9340052	N/A	2019-12-21 @ 8:00 am	2019-12-23 @ 8:00 am	27.4 $\pm$ 2.6 D	2020-01-03
9340057	N/A	2019-12-21 @ 8:00 am	2019-12-23 @ 8:00 am	27.3 $\pm$ 2.5 D	2020-01-03
9340025	N/A	2019-12-21 @ 8:00 am	2019-12-23 @ 8:00 am	25.1 $\pm$ 2.4 D	2020-01-03
9341711	N/A	2019-12-21 @ 9:00 am	2019-12-23 @ 9:00 am	22.5 $\pm$ 2.2 D	2020-01-03
9340079	N/A	2019-12-21 @ 9:00 am	2019-12-23 @ 9:00 am	26.9 $\pm$ 2.5 D	2020-01-03
9340062	N/A	2019-12-21 @ 9:00 am	2019-12-23 @ 9:00 am	25.6 $\pm$ 2.5 D	2020-01-03
9340030	N/A	2019-12-21 @ 8:00 am	2019-12-23 @ 8:00 am	25.0 $\pm$ 2.4 D	2020-01-03
9341716	N/A	2019-12-21 @ 9:00 am	2019-12-23 @ 9:00 am	25.1 $\pm$ 2.4 D	2020-01-03
9340084	N/A	2019-12-21 @ 9:00 am	2019-12-23 @ 9:00 am	24.5 $\pm$ 2.3 D	2020-01-03

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# EXPOSURE IN BOWSER-MORNER RADON CHAMBER

CLIENT KCI Technologies Inc. Job Number 193598

NOMINAL Conditions: Radon Conc \_\_\_\_\_ pCi/L Rel. Hum \_\_\_\_\_ % Temp. \_\_\_\_\_ F

Date Start: 12/21/19 Date Stop: 12/23/19

Time Start: 0830 Time Stop: 0830

(Group 4)  
Device No.'s: (20) Char. Bags -

9340061 thru 9340080

Temp of 70.0  
RH % 50.1  
Avg pCi/L 25.5

52

Date Start: 12/21/19 Date Stop: 12/23/19

Time Start: 0835 Time Stop: 0835

(Group 5)  
Device No.'s: (20) Char. Bags -

9340081 thru 9340100

Temp of 70.0  
RH % 50.1  
Avg pCi/L 25.5

25

Date Start: 12/21/19 Date Stop: 12/23/19

Time Start: 0840 Time Stop: 0840

(Group 6)  
Device No.'s: (20) Char. Bags -

9341701 thru 9341720

Temp of 70.0  
RH % 50.1  
Avg pCi/L 25.5

25

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

Radon test result report for:**MONTGOMERY KNOLLS ES  
MAIN**

Kit #	Room Id	Started	Ended	pCi/L	Analyzed
9341173	100	2020-01-07 @ 10:00 am	2020-01-10 @ 10:00 am	< 0.3	2020-01-13
9341172	100	2020-01-07 @ 10:00 am	2020-01-10 @ 10:00 am	< 0.3	2020-01-13
9341186	100B	2020-01-07 @ 10:00 am	2020-01-10 @ 10:00 am	< 0.3	2020-01-13
9341178	100C	2020-01-07 @ 10:00 am	2020-01-10 @ 10:00 am	< 0.3	2020-01-13
9341179	100D	2020-01-07 @ 10:00 am	2020-01-10 @ 10:00 am	< 0.3	2020-01-13
9341180	100F	2020-01-07 @ 10:00 am	2020-01-10 @ 10:00 am	< 0.3	2020-01-13
9341181	100H	2020-01-07 @ 10:00 am	2020-01-10 @ 10:00 am	< 0.3	2020-01-13
9341185	100I	2020-01-07 @ 10:00 am	2020-01-10 @ 10:00 am	< 0.3	2020-01-13
9341184	100J	2020-01-07 @ 10:00 am	2020-01-10 @ 10:00 am	< 0.3	2020-01-13
9341183	100K	2020-01-07 @ 10:00 am	2020-01-10 @ 10:00 am	< 0.3	2020-01-13
9341182	100K	2020-01-07 @ 10:00 am	2020-01-10 @ 10:00 am	< 0.3	2020-01-13
9341101	101	2020-01-07 @ 8:00 am	2020-01-10 @ 8:00 am	< 0.3	2020-01-13
9341176	102A	2020-01-07 @ 10:00 am	2020-01-10 @ 10:00 am	< 0.3	2020-01-13
9341175	102B	2020-01-07 @ 10:00 am	2020-01-10 @ 10:00 am	< 0.3	2020-01-13
9341174	102B	2020-01-07 @ 10:00 am	2020-01-10 @ 10:00 am	< 0.3	2020-01-13
9341177	102C	2020-01-07 @ 10:00 am	2020-01-10 @ 10:00 am	< 0.3	2020-01-13
9341109	103	2020-01-07 @ 8:00 am	2020-01-10 @ 9:00 am	< 0.3	2020-01-13
9341108	103	2020-01-07 @ 8:00 am	2020-01-10 @ 9:00 am	< 0.3	2020-01-13
9341171	103C	2020-01-07 @ 10:00 am	2020-01-10 @ 9:00 am	< 0.3	2020-01-13
9341102	104	2020-01-07 @ 8:00 am	2020-01-10 @ 8:00 am	< 0.3	2020-01-13
9341103	104	2020-01-07 @ 8:00 am	2020-01-10 @ 8:00 am	< 0.3	2020-01-13
9341104	106	2020-01-07 @ 8:00 am	2020-01-10 @ 10:00 am	< 0.3	2020-01-13
9341105	108	2020-01-07 @ 8:00 am	2020-01-10 @ 10:00 am	< 0.3	2020-01-13
9341106	110	2020-01-07 @ 8:00 am	2020-01-10 @ 8:00 am	< 0.3	2020-01-13
9341110	111	2020-01-07 @ 8:00 am	2020-01-10 @ 9:00 am	< 0.3	2020-01-13
9341107	112	2020-01-07 @ 8:00 am	2020-01-10 @ 10:00 am	< 0.3	2020-01-13
9341111	113	2020-01-07 @ 8:00 am	2020-01-10 @ 9:00 am	< 0.3	2020-01-13
9341112	114	2020-01-07 @ 8:00 am	2020-01-10 @ 8:00 am	< 0.3	2020-01-13
9341113	114	2020-01-07 @ 8:00 am	2020-01-10 @ 8:00 am	< 0.3	2020-01-13
9341120	117	2020-01-07 @ 8:00 am	2020-01-10 @ 10:00 am	< 0.3	2020-01-13
9341114	118A	2020-01-07 @ 8:00 am	2020-01-10 @ 8:00 am	< 0.3	2020-01-13
9341115	118A	2020-01-07 @ 8:00 am	2020-01-10 @ 8:00 am	< 0.3	2020-01-13
9341116	118C	2020-01-07 @ 8:00 am	2020-01-10 @ 8:00 am	< 0.3	2020-01-13
9341118	118C	2020-01-07 @ 8:00 am	2020-01-10 @ 10:00 am	< 0.3	2020-01-13
9341117	118E	2020-01-07 @ 8:00 am	2020-01-10 @ 8:00 am	< 0.3	2020-01-13
9341119	120	2020-01-07 @ 8:00 am	2020-01-10 @ 8:00 am	< 0.3	2020-01-13
9341121	121	2020-01-07 @ 8:00 am	2020-01-10 @ 9:00 am	< 0.3	2020-01-13



Radon test result report for:**MONTGOMERY KNOLLS ES  
MAIN**

Kit #	Room Id	Started	Ended	pCi/L	Analyzed
9341122	122	2020-01-07 @ 8:00 am	2020-01-10 @ 9:00 am	< 0.3	2020-01-13
9341123	122	2020-01-07 @ 8:00 am	2020-01-10 @ 9:00 am	< 0.3	2020-01-13
9341124	123	2020-01-07 @ 8:00 am	2020-01-10 @ 9:00 am	< 0.3	2020-01-13
9341125	124	2020-01-07 @ 9:00 am	2020-01-10 @ 9:00 am	1.0 ± 0.3	2020-01-13
9341127	125	2020-01-07 @ 9:00 am	2020-01-10 @ 9:00 am	1.9 ± 0.3	2020-01-13
9341130	127	2020-01-07 @ 9:00 am	2020-01-10 @ 9:00 am	< 0.3	2020-01-13
9341126	128	2020-01-07 @ 9:00 am	2020-01-10 @ 10:00 am	< 0.3	2020-01-13
9341128	130	2020-01-07 @ 9:00 am	2020-01-10 @ 9:00 am	< 0.3	2020-01-13
9341129	132	2020-01-07 @ 9:00 am	2020-01-10 @ 10:00 am	< 0.3	2020-01-13
9341141	133	2020-01-07 @ 9:00 am	2020-01-10 @ 9:00 am	0.6 ± 0.3	2020-01-13
9341131	138	2020-01-07 @ 9:00 am	2020-01-10 @ 9:00 am	0.6 ± 0.3	2020-01-13
9341132	140	2020-01-07 @ 9:00 am	2020-01-10 @ 9:00 am	< 0.3	2020-01-13
9341133	140	2020-01-07 @ 9:00 am	2020-01-10 @ 9:00 am	< 0.3	2020-01-13
9341137	143	2020-01-07 @ 9:00 am	2020-01-10 @ 9:00 am	< 0.3	2020-01-13
9341134	144	2020-01-07 @ 9:00 am	2020-01-10 @ 9:00 am	< 0.3	2020-01-13
9341136	146	2020-01-07 @ 9:00 am	2020-01-10 @ 9:00 am	< 0.3	2020-01-13
9341135	146	2020-01-07 @ 9:00 am	2020-01-10 @ 9:00 am	< 0.3	2020-01-13
9341139	147	2020-01-07 @ 9:00 am	2020-01-10 @ 9:00 am	< 0.3	2020-01-13
9341143	149	2020-01-07 @ 9:00 am	2020-01-10 @ 9:00 am	< 0.3	2020-01-13
9341144	149	2020-01-07 @ 9:00 am	2020-01-10 @ 9:00 am	0.6 ± 0.3	2020-01-13
9341142	149	2020-01-07 @ 9:00 am	2020-01-10 @ 9:00 am	< 0.3	2020-01-13
9341138	150	2020-01-07 @ 9:00 am	2020-01-10 @ 9:00 am	< 0.3	2020-01-13
9341148	151	2020-01-07 @ 9:00 am	2020-01-10 @ 9:00 am	0.6 ± 0.3	2020-01-13
9341147	152	2020-01-07 @ 9:00 am	2020-01-10 @ 9:00 am	< 0.3	2020-01-13
9341149	153	2020-01-07 @ 9:00 am	2020-01-10 @ 9:00 am	< 0.3	2020-01-13
9341146	154	2020-01-07 @ 9:00 am	2020-01-10 @ 9:00 am	0.6 ± 0.3	2020-01-13
9341150	157	2020-01-07 @ 9:00 am	2020-01-10 @ 9:00 am	< 0.3	2020-01-13
9341153	168	2020-01-07 @ 9:00 am	2020-01-10 @ 9:00 am	< 0.3	2020-01-13
9341151	168	2020-01-07 @ 9:00 am	2020-01-10 @ 9:00 am	0.8 ± 0.3	2020-01-13
9341152	168	2020-01-07 @ 9:00 am	2020-01-10 @ 9:00 am	0.9 ± 0.3	2020-01-13
9341154	168A	2020-01-07 @ 10:00 am	2020-01-10 @ 9:00 am	1.3 ± 0.3	2020-01-13
9341155	168A	2020-01-07 @ 10:00 am	2020-01-10 @ 9:00 am	< 0.3	2020-01-13
9341156	170	2020-01-07 @ 10:00 am	2020-01-10 @ 10:00 am	< 0.3	2020-01-13
9341159	170C	2020-01-07 @ 10:00 am	2020-01-10 @ 10:00 am	0.6 ± 0.3	2020-01-13
9341158	170D	2020-01-07 @ 10:00 am	2020-01-10 @ 10:00 am	< 0.3	2020-01-13
9341157	170E	2020-01-07 @ 10:00 am	2020-01-10 @ 10:00 am	< 0.3	2020-01-13
9341163	171	2020-01-07 @ 10:00 am	2020-01-10 @ 9:00 am	< 0.3	2020-01-13

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January 20, 2020

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

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Radon test result report for:

**MONTGOMERY KNOLLS ES  
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>
9341162	171	2020-01-07 @ 10:00 am	2020-01-10 @ 9:00 am	< 0.3	2020-01-13
9341166	173	2020-01-07 @ 10:00 am	2020-01-10 @ 9:00 am	< 0.3	2020-01-13
9341167	175	2020-01-07 @ 10:00 am	2020-01-10 @ 9:00 am	< 0.3	2020-01-13
9341170	177	2020-01-07 @ 10:00 am	2020-01-10 @ 9:00 am	< 0.3	2020-01-13
9341145	178	2020-01-07 @ 9:00 am	2020-01-10 @ 9:00 am	0.9 ± 0.3	2020-01-13
9341160	186	2020-01-07 @ 10:00 am	2020-01-10 @ 9:00 am	< 0.3	2020-01-13
9341161	188	2020-01-07 @ 10:00 am	2020-01-10 @ 9:00 am	< 0.3	2020-01-13
9341164	190	2020-01-07 @ 10:00 am	2020-01-10 @ 9:00 am	< 0.3	2020-01-13
9341165	192	2020-01-07 @ 10:00 am	2020-01-10 @ 9:00 am	0.7 ± 0.3	2020-01-13
9341168	194	2020-01-07 @ 10:00 am	2020-01-10 @ 9:00 am	< 0.3	2020-01-13
9341169	196	2020-01-07 @ 10:00 am	2020-01-10 @ 9:00 am	< 0.3	2020-01-13
9341140	211	2020-01-07 @ 9:00 am	2020-01-10 @ 10:00 am	< 0.3	2020-01-13

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ENGINEERS • PLANNERS • SCIENTISTS • CONSTRUCTION MANAGERS  
Corporate Office: 936 Ridgebrook road • Sparks , Maryland 21152 • 410-316-7800 • (Fax) 410-316-7935

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## Radon Test Kit Chain of Custody

Project Name: MCPS Radon 2019 Week 3

Name of Schools:

- |                              |                            |
|------------------------------|----------------------------|
| 1. Bannockburn E.S.          | 12. Montgomery Knolls E.S. |
| 2. Bethesda E.S.             | 13. Newport Mills M.S.     |
| 3. Bethesda-Chevy Chase H.S. | 14. Oak View E.S.          |
| 4. Bradley Hill E.S.         | 15. Rock View E.S.         |
| 5. Burning Tree E.S.         | 16. Roscoe Nix E.S.        |
| 6. Burnt Mills E.S.          | 17. Sligo M.S.             |
| 7. East Silver Springs E.S.  | 18. Spring Mill Center     |
| 8. Einstein H.S.             | 19. Springbrook H.S.       |
| 9. Flora Singer E.S.         | 20. Westland M.S.          |
| 10. Key M.S.                 | 21. Woodlin M.S.           |
| 11. Montgomery Blair H.S.    |                            |

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	Date	Initials
Radon Test Kits Deployed	1/6/20 to 1/7/20	SM
Radon Test Kits Collected	1/9/20 to 1/10/20	SM
Radon Test Kits Shipped to Lab*	1/10/20	SM
Radon Test Kits Received by Lab*	1/13/202	SM

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

**MCPS RADON TESTING - EXECUTIVE SUMMARY**

Site Name	Montgomery Knolls Elementary School
Date of Report	March 12, 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	16
# Rooms $\geq 4.0$ pCi/L	0
Lowest Value	<0.3 pCi/L
Highest Value	1.1 pCi/L

**Project Status**

Current Project Status at this time: Retesting completed; no further action at this time.



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936 RIDGEBROOK ROAD • SPARKS, MD 21152 • 410-316-7800 • (FAX) 410-316-7935

March 12, 2018

Mr. Richard Cox, MS  
Team Leader  
Montgomery County Public Schools  
Division of Maintenance  
Gaithersburg, Maryland 20879

Re: Radon Testing Services

KCI Job #1214634188

**Location: Montgomery Knolls Elementary School**

807 Daleview Drive  
Silver Spring, Maryland 20901

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 Montgomery Knolls Elementary School, located at 807 Daleview Drive in Silver Spring, Maryland 20901 (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 13, 2018 and deployed twenty-one (21) 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).

---

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 16, 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 ranged from the mid-20s to upper 40s and high temperatures ranged from the high-30s to the high-60s. Maximum sustained winds ranged from 10-18 miles per hour. Average humidity was around 73%. 0.30 Inches of precipitation was recorded during the 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). 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>
$\geq 4.0$ pCi/L	None	N/A
$\leq 4.0$ 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,



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

Table 1 - Radon Testing Results		
Montgomery Knolls Elementary School		
Test Period: 02/13/18-02/16/18		
Kit Number	Room / Area	Result
7986529	113	< 0.3
7986530	114	< 0.3
7986507	149	< 0.3
7986511	168	0.9
7986512	168	0.8
7986522	171	< 0.3
7986515	194	0.6
7986527	100D	< 0.3
7986503	118 (Kitchen area with sink.)	0.6
7986521	118B	< 0.3
7986513	* 123 (Open Window)	< 0.3
7986525	149B	1.0
7986517	170E	0.6
7986508	171A	0.5
7986514	BSM OFFICE	1.1
7986518	KITCHEN	1.0
7986533	MEDIA CENTER	0.8

Table Note:

\* Missing or Compromised Sample

Table 2 - Radon Testing Results		
Montgomery Knolls Elementary School		
Test Period: 02/13/18-02/16/18		
Kit Number	QC Type	Result
7986506	D (149B)	0.9
7986528	D (171A)	0.9
7986509	D (194)	< 0.3
7986534	FB (149)	< 0.3

Table Note:

\* Missing or Compromised Sample

## ATTACHMENT C

### Laboratory Analytical Results

February 27, 2018

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

Radon test result report for:

**MONTGOMERY KNOLLS ELEMENTARY SCHOOL  
MAIN**

Kit #	Room Id	Started	Ended	pCi/L	Analyzed
7986527	100D	2018-02-13 @ 2:00 pm	2018-02-16 @ 12:00 pm	< 0.3	2018-02-20
7986529	113	2018-02-13 @ 2:00 pm	2018-02-16 @ 12:00 pm	< 0.3	2018-02-20
7986530	114	2018-02-13 @ 2:00 pm	2018-02-16 @ 12:00 pm	< 0.3	2018-02-20
7986503	118	2018-02-13 @ 1:00 pm	2018-02-16 @ 12:00 pm	0.6 ± 0.3	2018-02-20
7986521	118B	2018-02-13 @ 2:00 pm	2018-02-16 @ 12:00 pm	< 0.3	2018-02-20
7986513	123	2018-02-13 @ 1:00 pm	2018-02-16 @ 12:00 pm	< 0.3	2018-02-20
7986534	149	2018-02-13 @ 2:00 pm	2018-02-16 @ 12:00 pm	< 0.3	2018-02-20
7986507	149	2018-02-13 @ 2:00 pm	2018-02-16 @ 12:00 pm	< 0.3	2018-02-20
7986525	149B	2018-02-13 @ 2:00 pm	2018-02-16 @ 12:00 pm	1.0 ± 0.4	2018-02-20
7986506	149B	2018-02-13 @ 2:00 pm	2018-02-16 @ 12:00 pm	0.9 ± 0.3	2018-02-20
7986511	168	2018-02-13 @ 1:00 pm	2018-02-16 @ 12:00 pm	0.9 ± 0.3	2018-02-20
7986512	168	2018-02-13 @ 1:00 pm	2018-02-16 @ 12:00 pm	0.8 ± 0.3	2018-02-20
7986517	170E	2018-02-13 @ 1:00 pm	2018-02-16 @ 12:00 pm	0.6 ± 0.3	2018-02-20
7986522	171	2018-02-13 @ 1:00 pm	2018-02-16 @ 12:00 pm	< 0.3	2018-02-20
7986508	171A	2018-02-13 @ 1:00 pm	2018-02-16 @ 12:00 pm	0.5 ± 0.3	2018-02-20
7986528	171A	2018-02-13 @ 1:00 pm	2018-02-16 @ 12:00 pm	0.9 ± 0.3	2018-02-20
7986515	194	2018-02-13 @ 1:00 pm	2018-02-16 @ 12:00 pm	0.6 ± 0.3	2018-02-20
7986509	194	2018-02-13 @ 1:00 pm	2018-02-16 @ 12:00 pm	< 0.3	2018-02-20
7986514	BSM OFFICE	2018-02-13 @ 2:00 pm	2018-02-16 @ 12:00 pm	1.1 ± 0.3	2018-02-20
7986518	KITCHEN	2018-02-13 @ 2:00 pm	2018-02-16 @ 12:00 pm	1.0 ± 0.3	2018-02-20
7986533	MEDIA CENTER	2018-02-13 @ 2:00 pm	2018-02-16 @ 12:00 pm	0.8 ± 0.3	2018-02-20



## Radon Test Kit Chain of Custody

Project Name: MCPS Radon Phase

Names of Schools:

- |                                       |  |
|---------------------------------------|--|
| 1. Westbrook Elementary School        | 21. E. Silver Spring Elementary School |
| 2. Westland Middle School             | 22. Silver Spring Int. Middle School   |
| 3. Walt Whitman High School           | 23. Clarksburg High School             |
| 4. Cloverly Elementary School         | 24. Rosa Parks Middle School           |
| 5. Sligo Middle School                | 25. Greenwood Elementary School        |
| 6. Flora Singer Elementary School     | 26. Montgomery Knolls Elem. School     |
| 7. Albert Einstein High School        | 27. Watkins Mill Elementary School     |
| 8. Roscoe Nix Elementary School       | 28. Gaithersburg Elementary School     |
| 9. Mario Loiederman Middle School     | 29. Viers Mill Elementary School       |
| 10. Sargent Shriver Elementary School | 30. Rock View Elementary School        |
| 11. Whetstone Elementary School       |  |
| 12. Brooke Grove Elementary School    |  |
| 13. Clearspring Elementary School     |  |
| 14. Beall Elementary School           |  |
| 15. Maryvale Elementary School        |  |
| 16. Lathrop E. Smith Center           |  |
| 17. Laytonsville Elementary School    |  |
| 18. Germantown Elementary School      |  |
| 19. Spring Mill Center                |  |
| 20. Northwood High School             |  |

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	Date	Initials
Radon Test Kits Deployed	2/13/18	JM
Radon Test Kits Collected	2/16/18	JM
Radon Test Kits Shipped to Lab*	2/16/18	JM
Radon Test Kits Received by Lab*	2/20/18	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**

Kit #	Room Id	Started	Ended	pCi/L	Analyzed
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

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

February 27, 2018

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

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

Kit #	Room Id	Started	Ended	pCi/L	Analyzed
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

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



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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).**

---

Kit #	Room Id	Started	Ended	pCi/L	Analyzed
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	Montgomery Knolls Elementary School
Date of Report	January 30, 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	70
# Rooms $\geq 4.0$ pCi/L	0
Lowest Value	< 0.3 pCi/L
Highest Value	2.5 pCi/L

**Project Status**

Current Project Status at this time: Results satisfactory to date; missed locations and missing/compromised tests to be sampled.



ENGINEERS • PLANNERS • SCIENTISTS • CONSTRUCTION MANAGERS

936 RIDGEBROOK ROAD • SPARKS, MD 21152 • 410-316-7800 • (FAX) 410-316-7935

January 30, 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: Montgomery Knolls Elementary School**

807 Daleview Drive  
Silver Spring, Maryland 20901

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 Montgomery Knolls Elementary School, located at 807 Daleview Drive in Silver Spring, Maryland 20901 (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 November 27, 2017 and deployed eighty-five (85) 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 November 30, 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 30s and high temperatures ranged from the low-50s to mid-60s. Maximum sustained winds ranged from 8-15 miles per hour. Average humidity was around 65%. 0.02 Inches of precipitation was recorded during the testing period.

A magnitude 4.1 earthquake was reported on Thursday, November 30 near Dover, Delaware approximately 95 miles east of Gaithersburg, Maryland. The earthquake occurred during or just after the radon testing period for this facility. In general, enhanced radon emissions have been observed prior to earthquakes and this has been recorded all over the world, according to the research article entitled *Radon-222: A Potential Short-Term Earthquake Precursor*, published June 30, 2015 in the Journal of Earth Science and Climate

Change. The nearby earthquake, which occurred during or prior to the testing period, may have resulted in higher-than-normal radon test results for this facility.

## **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>
$\geq 4.0$ pCi/L	None	N/A
$\leq 4.0$ pCi/L	See Attachment B	See Attachment B

<b>Quality Control Samples</b>	
Results of Blank Canisters:	The field blanks, 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

Radon Testing Results		
Montgomery Knolls Elementary School		
Test Period: 11/27/17-11/30/17		
Kit Number	Room / Area	Result
7976083	101	0.8
7976076	103	0.7
7976082	103	0.7
7977569	104	0.9
7977567	106	0.7
7977568	108	0.6
7977559	110	< 0.3
7976087	111	1.0
7977575	112	0.7
7976071	117	< 0.3
7977570	120	0.8
7976081	121	< 0.3
7977578	122	< 0.3
7977580	124	0.8
7976092	125	0.9
7976086	127	< 0.3
7977579	128	< 0.3
7977552	130	< 0.3
7977553	132	0.6
7976078	133	1.1
7977551	138	0.6
7977577	140	0.8
7976074	143	0.6
7976048	144	< 0.3
7977556	146	0.7
7976073	147	< 0.3
7976003	149	0.7
7976072	150	1.1
7976010	151	0.8
7976079	152	0.5
7976016	153	1.6
7976080	154	< 0.3
7976066	157	1.1
7976297	168	0.9
7976285	170	1.4
7976094	173	1.1
7976088	175	0.8
7976077	177	0.8
7976283	186	0.7
7976277	188	1.1
7976282	190	1.2
7976272	192	1.5
7976273	194	0.7
7976279	196	< 0.3
7976265	202	0.6
7976061	100A	< 0.3

Table Note:

\* Missing or Compromised Sample

Radon Testing Results		
Montgomery Knolls Elementary School		
Test Period: 11/27/17-11/30/17		
Kit Number	Room / Area	Result
7976085	100B	1.1
7976090	100C	< 0.3
7976014	* 100D (Tampered)	< 0.3
7977555	100F	0.6
7976097	100H	0.9
7976060	100I	< 0.3
7977565	100J	0.8
7977566	100K	0.5
7976096	102A	0.7
7976091	102B	< 0.3
7976093	* 113 (Tampered)	0.8
7977558	* 114 (Missing)	-
7977557	118A	< 0.3
7977560	* 118B (Tampered)	< 0.3
7977576	118C	< 0.3
7977554	118E	< 0.3
7976075	* 123 (Open Window )	< 0.3
7976019	* 149 (Tampered)	0.8
7976296	* 168 (Missing)	-
7976286	168A	2.5
7976065	170C	1.2
7976280	170D	1.1
7976284	* 170E (Missing)	-
7976278	170F	1.4
7976004	* 171 (Tampered)	0.7
7976098	FRONT OFFICE	0.7
7976089	MEDIA CENTER	0.6

Table Note:

\* Missing or Compromised Sample

Radon Testing Results		
Montgomery Knolls Elementary School		
Test Period: 11/27/17-11/30/17		
Kit Number	QC Type	Result
7976095	D (102B)	0.7
7977563	D (110)	0.8
7976070	D (111)	0.7
7977588	D (112)	0.6
7976271	D (177)	0.8
7976270	D (194)	0.5
7976276	D (196)	0.5
7976264	D (202)	0.6
7976084	D (FRONT OFFICE)	0.6
7976099	FB (102A)	< 0.3
7976100	FB (104)	< 0.3
7978494	OB (OB)	< 0.3

Table Note:

\* Missing or Compromised Sample



# ATTACHMENT C

## Laboratory Analytical Results

Radon test result report for:**MONTGOMERY KNOLLS ES****1**

Kit #	Room Id	Started	Ended	pCi/L	Analyzed
7976061	100A	2017-11-27 @ 5:00 pm	2017-11-30 @ 12:00 pm	< 0.3	2017-12-04
7976085	100B	2017-11-27 @ 1:00 pm	2017-11-30 @ 11:00 am	1.1 ± 0.4	2017-12-05
7976090	100C	2017-11-27 @ 1:00 pm	2017-11-30 @ 12:00 pm	< 0.3	2017-12-04
7976014	100D	2017-11-27 @ 1:00 pm	2017-11-30 @ 11:00 am	< 0.3	2017-12-05
7977555	100F	2017-11-27 @ 2:00 pm	2017-11-30 @ 11:00 am	0.6 ± 0.4	2017-12-05
7976097	100H	2017-11-27 @ 2:00 pm	2017-11-30 @ 11:00 am	0.9 ± 0.4	2017-12-05
7976060	100I	2017-11-27 @ 5:00 pm	2017-11-30 @ 11:00 am	< 0.3	2017-12-05
7977565	100J	2017-11-27 @ 2:00 pm	2017-11-30 @ 11:00 am	0.8 ± 0.3	2017-12-05
7977566	100K	2017-11-27 @ 2:00 pm	2017-11-30 @ 11:00 am	0.5 ± 0.4	2017-12-04
7976083	101	2017-11-27 @ 4:00 pm	2017-11-30 @ 11:00 am	0.8 ± 0.4	2017-12-05
7976096	102A	2017-11-27 @ 2:00 pm	2017-11-30 @ 11:00 am	0.7 ± 0.3	2017-12-04
7976099	102A	2017-11-27 @ 2:00 pm	2017-11-30 @ 11:00 am	< 0.3	2017-12-04
7976091	102B	2017-11-27 @ 2:00 pm	2017-11-30 @ 12:00 pm	< 0.3	2017-12-05
7976095	102B	2017-11-27 @ 2:00 pm	2017-11-30 @ 12:00 pm	0.7 ± 0.4	2017-12-05
7976076	103	2017-11-27 @ 4:00 pm	2017-11-30 @ 11:00 am	0.7 ± 0.3	2017-12-04
7976082	103	2017-11-27 @ 4:00 pm	2017-11-30 @ 11:00 am	0.7 ± 0.4	2017-12-04
7976100	104	2017-11-27 @ 2:00 pm	2017-11-30 @ 11:00 am	< 0.3	2017-12-04
7977569	104	2017-11-27 @ 2:00 pm	2017-11-30 @ 11:00 am	0.9 ± 0.4	2017-12-05
7977567	106	2017-11-27 @ 2:00 pm	2017-11-30 @ 11:00 am	0.7 ± 0.4	2017-12-04
7977568	108	2017-11-27 @ 2:00 pm	2017-11-30 @ 11:00 am	0.6 ± 0.3	2017-12-04
7977559	110	2017-11-27 @ 2:00 pm	2017-11-30 @ 11:00 am	< 0.3	2017-12-04
7977563	110	2017-11-27 @ 2:00 pm	2017-11-30 @ 11:00 am	0.8 ± 0.4	2017-12-04
7976070	111	2017-11-27 @ 3:00 pm	2017-11-30 @ 11:00 am	0.7 ± 0.4	2017-12-04
7976087	111	2017-11-27 @ 3:00 pm	2017-11-30 @ 11:00 am	1.0 ± 0.4	2017-12-05
7977588	112	2017-11-27 @ 2:00 pm	2017-11-30 @ 11:00 am	0.6 ± 0.4	2017-12-04
7977575	112	2017-11-27 @ 2:00 pm	2017-11-30 @ 11:00 am	0.7 ± 0.4	2017-12-05
7976093	113	2017-11-27 @ 3:00 pm	2017-11-30 @ 11:00 am	0.8 ± 0.4	2017-12-04
7976071	117	2017-11-27 @ 3:00 pm	2017-11-30 @ 11:00 am	< 0.3	2017-12-05
7977557	118A	2017-11-27 @ 2:00 pm	2017-11-30 @ 11:00 am	< 0.3	2017-12-05
7977560	118B	2017-11-27 @ 2:00 pm	2017-11-30 @ 11:00 am	< 0.3	2017-12-04
7977576	118C	2017-11-27 @ 2:00 pm	2017-11-30 @ 11:00 am	< 0.3	2017-12-04
7977554	118E	2017-11-27 @ 2:00 pm	2017-11-30 @ 11:00 am	< 0.3	2017-12-05
7977570	120	2017-11-27 @ 3:00 pm	2017-11-30 @ 11:00 am	0.8 ± 0.4	2017-12-05
7976081	121	2017-11-27 @ 3:00 pm	2017-11-30 @ 11:00 am	< 0.3	2017-12-04
7977578	122	2017-11-27 @ 3:00 pm	2017-11-30 @ 11:00 am	< 0.3	2017-12-04
7976075	123	2017-11-27 @ 3:00 pm	2017-11-30 @ 11:00 am	< 0.3	2017-12-05
7977580	124	2017-11-27 @ 3:00 pm	2017-11-30 @ 11:00 am	0.8 ± 0.4	2017-12-05

Radon test result report for:**MONTGOMERY KNOLLS ES****1**

Kit #	Room Id	Started	Ended	pCi/L	Analyzed
7976092	125	2017-11-27 @ 3:00 pm	2017-11-30 @ 11:00 am	0.9 ± 0.4	2017-12-04
7976086	127	2017-11-27 @ 3:00 pm	2017-11-30 @ 11:00 am	< 0.3	2017-12-04
7977579	128	2017-11-27 @ 3:00 pm	2017-11-30 @ 11:00 am	< 0.3	2017-12-04
7977552	130	2017-11-27 @ 3:00 pm	2017-11-30 @ 11:00 am	< 0.3	2017-12-05
7977553	132	2017-11-27 @ 3:00 pm	2017-11-30 @ 11:00 am	0.6 ± 0.4	2017-12-04
7976078	133	2017-11-27 @ 3:00 pm	2017-11-30 @ 11:00 am	1.1 ± 0.4	2017-12-04
7977551	138	2017-11-27 @ 3:00 pm	2017-11-30 @ 11:00 am	0.6 ± 0.4	2017-12-04
7977577	140	2017-11-27 @ 3:00 pm	2017-11-30 @ 11:00 am	0.8 ± 0.3	2017-12-04
7976074	143	2017-11-27 @ 3:00 pm	2017-11-30 @ 11:00 am	0.6 ± 0.4	2017-12-04
7976048	144	2017-11-27 @ 3:00 pm	2017-11-30 @ 11:00 am	< 0.3	2017-12-04
7977556	146	2017-11-27 @ 3:00 pm	2017-11-30 @ 11:00 am	0.7 ± 0.4	2017-12-05
7976073	147	2017-11-27 @ 3:00 pm	2017-11-30 @ 11:00 am	< 0.3	2017-12-04
7976019	149	2017-11-27 @ 4:00 pm	2017-11-30 @ 11:00 am	0.8 ± 0.4	2017-12-05
7976003	149	2017-11-27 @ 4:00 pm	2017-11-30 @ 11:00 am	0.7 ± 0.4	2017-12-05
7976072	150	2017-11-27 @ 3:00 pm	2017-11-30 @ 11:00 am	1.1 ± 0.3	2017-12-04
7976010	151	2017-11-27 @ 4:00 pm	2017-11-30 @ 11:00 am	0.8 ± 0.4	2017-12-05
7976079	152	2017-11-27 @ 3:00 pm	2017-11-30 @ 11:00 am	0.5 ± 0.4	2017-12-05
7976016	153	2017-11-27 @ 4:00 pm	2017-11-30 @ 11:00 am	1.6 ± 0.4	2017-12-05
7976080	154	2017-11-27 @ 3:00 pm	2017-11-30 @ 11:00 am	< 0.3	2017-12-04
7976066	157	2017-11-27 @ 4:00 pm	2017-11-30 @ 11:00 am	1.1 ± 0.4	2017-12-05
7976297	168	2017-11-27 @ 4:00 pm	2017-11-30 @ 11:00 am	0.9 ± 0.4	2017-12-05
7976286	168A	2017-11-27 @ 4:00 pm	2017-11-30 @ 12:00 pm	2.5 ± 0.4	2017-12-04
7976285	170	2017-11-27 @ 4:00 pm	2017-11-30 @ 12:00 pm	1.4 ± 0.4	2017-12-05
7976065	170C	2017-11-27 @ 5:00 pm	2017-11-30 @ 12:00 pm	1.2 ± 0.4	2017-12-05
7976280	170D	2017-11-27 @ 5:00 pm	2017-11-30 @ 12:00 pm	1.1 ± 0.4	2017-12-05
7976278	170F	2017-11-27 @ 5:00 pm	2017-11-30 @ 12:00 pm	1.4 ± 0.4	2017-12-05
7976004	171	2017-11-27 @ 4:00 pm	2017-11-30 @ 11:00 am	0.7 ± 0.4	2017-12-05
7976094	173	2017-11-27 @ 4:00 pm	2017-11-30 @ 11:00 am	1.1 ± 0.3	2017-12-04
7976088	175	2017-11-27 @ 4:00 pm	2017-11-30 @ 11:00 am	0.8 ± 0.3	2017-12-04
7976077	177	2017-11-27 @ 4:00 pm	2017-11-30 @ 11:00 am	0.8 ± 0.3	2017-12-05
7976271	177	2017-11-27 @ 5:00 pm	2017-11-30 @ 11:00 am	0.8 ± 0.4	2017-12-05
7976283	186	2017-11-27 @ 5:00 pm	2017-11-30 @ 12:00 pm	0.7 ± 0.4	2017-12-05
7976277	188	2017-11-27 @ 5:00 pm	2017-11-30 @ 12:00 pm	1.1 ± 0.3	2017-12-04
7976282	190	2017-11-27 @ 5:00 pm	2017-11-30 @ 12:00 pm	1.2 ± 0.3	2017-12-04
7976272	192	2017-11-27 @ 5:00 pm	2017-11-30 @ 12:00 pm	1.5 ± 0.4	2017-12-05
7976273	194	2017-11-27 @ 5:00 pm	2017-11-30 @ 12:00 pm	0.7 ± 0.4	2017-12-04
7976270	194	2017-11-27 @ 5:00 pm	2017-11-30 @ 12:00 pm	0.5 ± 0.4	2017-12-05



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December 19, 2017

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

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Radon test result report for:

**MONTGOMERY KNOLLS ES**

**1**

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Kit #	Room Id	Started	Ended	pCi/L	Analyzed
7976279	196	2017-11-27 @ 5:00 pm	2017-11-30 @ 12:00 pm	< 0.3	2017-12-04
7976276	196	2017-11-27 @ 5:00 pm	2017-11-30 @ 12:00 pm	0.5 ± 0.3	2017-12-05
7976265	202	2017-11-27 @ 5:00 pm	2017-11-30 @ 12:00 pm	0.6 ± 0.3	2017-12-04
7976264	202	2017-11-27 @ 5:00 pm	2017-11-30 @ 12:00 pm	0.6 ± 0.4	2017-12-05
7976098	FRONT OFFICE	2017-11-27 @ 1:00 pm	2017-11-30 @ 11:00 am	0.7 ± 0.3	2017-12-05
7976084	FRONT OFFICE	2017-11-27 @ 1:00 pm	2017-11-30 @ 11:00 am	0.6 ± 0.4	2017-12-05
7976089	MEDIA CENTER	2017-11-27 @ 4:00 pm	2017-11-30 @ 11:00 am	0.6 ± 0.4	2017-12-04
7978494	OB	2017-11-27 @ 1:00 pm	2017-11-30 @ 1:00 pm	< 0.3	2017-12-05

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

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December 21, 2017

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

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Radon test result report for:

**MONTGOMERY KNOLLS ES**

**1**

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Kit #	Room Id	Started	Ended	pCi/L	Analyzed
7977558	114	@	@		
7976296	168	@	@		
7976284	170E	@	@		

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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. Montgomery Knolls Elementary School       | 14. Flora Singer Elementary School    |
| 2. New Hampshire Estates Elementary School   | 15. Sligo Middle School               |
| 3. Montgomery Blair High School              | 16. Mario Loiederman Middle School    |
| 4. Silver Creek Middle School                | 17. Roscoe Nix Elementary School      |
| 5. Sligo Creek Elementary School             | 18. Sargent Shriver Elementary School |
| 6. East Silver Spring Elementary School      | 19.                                   |
| 7. Silver Spring International Middle School | 20.                                   |
| 8. Woodlin Elementary School                 | 21.                                   |
| 9. Northwood High School                     | 22.                                   |
| 10. Spring Mill Center                       | 23.                                   |
| 11. Westbrook Elementary School              | 24.                                   |
| 12. Westland Middle School                   | 25.                                   |
| 13. Cloverly Elementary School               | 26.                                   |

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	Date	Initials
Radon Test Kits Deployed	11/27/17	JM
Radon Test Kits Collected	11/30/17	JM
Radon Test Kits Shipped to Lab*	11/30/17	JM
Radon Test Kits Received by Lab*	12/04/17	JM

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

Radon test result report for:**TRANSIT 1****NONE**

Kit #	Room Id	Started	Ended	pCi/L	Analyzed
7978062	TRANSIT 1	2017-11-27 @ 4:00 pm	2017-11-30 @ 4:00 pm	< 0.3	2017-12-04
7975804	TRANSIT 10	2017-11-27 @ 4:00 pm	2017-11-30 @ 4:00 pm	< 0.3	2017-12-04
7977990	TRANSIT 11	2017-11-27 @ 4:00 pm	2017-11-30 @ 4:00 pm	< 0.3	2017-12-04
7978201	TRANSIT 12	2017-11-27 @ 4:00 pm	2017-11-30 @ 4:00 pm	< 0.3	2017-12-04
7978203	TRANSIT 13	2017-11-27 @ 4:00 pm	2017-11-30 @ 4:00 pm	< 0.3	2017-12-04
7978206	TRANSIT 14	2017-11-27 @ 4:00 pm	2017-11-30 @ 4:00 pm	< 0.3	2017-12-05
7978246	TRANSIT 15	2017-11-27 @ 4:00 pm	2017-11-30 @ 4:00 pm	< 0.3	2017-12-05
7978239	TRANSIT 16	2017-11-27 @ 4:00 pm	2017-11-30 @ 4:00 pm	< 0.3	2017-12-05
7978226	TRANSIT 17	2017-11-27 @ 4:00 pm	2017-11-30 @ 4:00 pm	< 0.3	2017-12-05
7975078	TRANSIT 18	2017-11-27 @ 4:00 pm	2017-11-30 @ 4:00 pm	< 0.3	2017-12-05
7975077	TRANSIT 19	2017-11-27 @ 4:00 pm	2017-11-30 @ 4:00 pm	< 0.3	2017-12-05
7978074	TRANSIT 2	2017-11-27 @ 4:00 pm	2017-11-30 @ 4:00 pm	< 0.3	2017-12-04
7975076	TRANSIT 20	2017-11-27 @ 4:00 pm	2017-11-30 @ 4:00 pm	< 0.3	2017-12-04
7975684	TRANSIT 21	2017-11-27 @ 4:00 pm	2017-11-30 @ 4:00 pm	< 0.3	2017-12-04
7975683	TRANSIT 22	2017-11-27 @ 4:00 pm	2017-11-30 @ 4:00 pm	< 0.3	2017-12-04
7975601	TRANSIT 23	2017-11-27 @ 4:00 pm	2017-11-30 @ 4:00 pm	< 0.3	2017-12-04
7978011	TRANSIT 24	2017-11-27 @ 4:00 pm	2017-11-30 @ 4:00 pm	< 0.3	2017-12-04
7978012	TRANSIT 25	2017-11-27 @ 4:00 pm	2017-11-30 @ 4:00 pm	< 0.3	2017-12-04
7978094	TRANSIT 26	2017-11-27 @ 4:00 pm	2017-11-30 @ 4:00 pm	< 0.3	2017-12-05
7975624	TRANSIT 27	2017-11-27 @ 4:00 pm	2017-11-30 @ 4:00 pm	< 0.3	2017-12-05
7834562	TRANSIT 28	2017-11-27 @ 4:00 pm	2017-11-30 @ 4:00 pm	< 0.3	2017-12-05
7977995	TRANSIT 29	2017-11-27 @ 4:00 pm	2017-11-30 @ 4:00 pm	< 0.3	2017-12-05
7978098	TRANSIT 3	2017-11-27 @ 4:00 pm	2017-11-30 @ 4:00 pm	< 0.3	2017-12-04
7977992	TRANSIT 30	2017-11-27 @ 4:00 pm	2017-11-30 @ 4:00 pm	< 0.3	2017-12-04
7978719	TRANSIT 4	2017-11-27 @ 4:00 pm	2017-11-30 @ 4:00 pm	< 0.3	2017-12-05
7978732	TRANSIT 5	2017-11-27 @ 4:00 pm	2017-11-30 @ 4:00 pm	< 0.3	2017-12-04
7978731	TRANSIT 6	2017-11-27 @ 4:00 pm	2017-11-30 @ 4:00 pm	< 0.3	2017-12-04
7975806	TRANSIT 7	2017-11-27 @ 4:00 pm	2017-11-30 @ 4:00 pm	< 0.3	2017-12-04
7975815	TRANSIT 8	2017-11-27 @ 4:00 pm	2017-11-30 @ 4:00 pm	< 0.3	2017-12-04
7975805	TRANSIT 9	2017-11-27 @ 4:00 pm	2017-11-30 @ 4:00 pm	< 0.3	2017-12-04

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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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Kit #	Room Id	Started	Ended	pCi/L	Analyzed
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) Chan. 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: Montgomery Knolls Elementary School

Date of Test Report:	5/27/2016
Round of Testing:	Initial Follow-up Post Remediation
# Rooms Tested:	70
# Rooms $\geq$ 4.0 pCi/L:	0
Low Value:	< 0.3
High Value:	2.1

#### Project Status:

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



ENGINEERS • PLANNERS • SCIENTISTS • CONSTRUCTION MANAGERS

936 RIDGEBROOK ROAD • SPARKS, MD 21152 • 410-316-7800 • (FAX) 410-316-7935

May 27, 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 # 12146341.39

Location: Montgomery Knolls Elementary School  
807 Daleview Drive  
Silver Spring, MD 20901

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 Montgomery Knolls Elementary School, located at 807 Daleview Drive in Silver Spring, Maryland 20901 (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 May 10, 2016 and deployed eighty (80) 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 May 13, 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  $\leq 65^{\circ}\text{F}$ .

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	none	n/a
$< 4.0$ pCi/L	See Attachment B	

Notes:

D- Duplicate sample

The field blanks, lab transit blanks, and one office blank had test results of less than the laboratory detection limit of 0.3 pCi/L. The second office blank had a low level of radon detected. The radon detection in the office blank is possibly attributable to laboratory error or a compromised test kit. 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. Moulds  
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 16 testing. Office blanks were not submitted under each school individually.

Radon Testing Results		
Montgomery Knolls Elementary School		
Test Period: 05/10/16-05/13/16		
Kit Number	Room / Area	Result
7756796	101	0.8
7756794	101	1.0
7756608	104	1.0
7756609	106	< 0.3
7756779	108	0.6
7756777	110	< 0.3
7756792	111	0.6
7756605	112	< 0.3
7756778	113	0.8
7756773	114	< 0.3
7756774	117	0.9
7756782	120	< 0.3
7756772	122	0.7
7756776	123	0.6
7756607	124	1.2
7756785	125	< 0.3
7756603	127	< 0.3
7756768	128	< 0.3
7756613	130	0.7
7756604	132	0.6
7756763	138	0.8
7756601	140	0.5
7756788	143	0.9
7756775	144	0.5
7756769	146	0.6
7756771	147	0.5
7756757	150	< 0.3
7756791	151	0.9
7756787	152	< 0.3
7756783	153	0.9
7756762	154	< 0.3
7756767	157	1.0
7756766	168	0.8
7756781	170	1.3
7756654	171	0.8
7756653	173	1.2
7756643	175	1.1
7756640	177	0.8
7756760	186	< 0.3
7756646	188	0.5
7756651	190	1.0
7756652	192	1.7
7756641	194	0.7
7756642	196	0.8
7756639	202	0.6
7756759	100B	0.5

Table Note:

\* Missing or Compromised Sample

Radon Testing Results		
Montgomery Knolls Elementary School		
Test Period: 05/10/16-05/13/16		
Kit Number	Room / Area	Result
7756611	100C	< 0.3
7756616	100D	< 0.3
7756606	100F	0.7
7756612	100H	< 0.3
7756799	100J	0.9
7756617	100K	0.6
7756602	102A	0.6
7756620	102B	0.7
7756798	103B	0.7
7756793	103C	0.6
7756619	118A	0.6
7756780	118C	0.8
7756770	118E	0.5
7756765	149B	0.9
7756615	168A	2.1
7756754	170C	1.3
7756645	170D	1.1
7756644	170E	1.1
7756650	170F	1.3
7756761	BSM	0.8
7756786	CAFÉ	0.8
7756784	CAFÉ	0.6
7756618	MAIN OFFICE	0.7
7756795	MEDIA 1	0.9
7756800	MEDIA 2	0.6
7756610	PEP	< 0.3

Table Note:

\* Missing or Compromised Sample

Radon Testing Results		
Montgomery Knolls Elementary School		
Test Period: 05/10/16-05/13/16		
Kit Number	QC Type	Result
7756790	D (120)	< 0.3
7756614	D (127)	< 0.3
7756758	D (152)	< 0.3
7756764	D (168)	0.8
7756649	D (171)	0.6
7756797	D (MAIN OFFICE)	0.6
7756789	FB (117)	< 0.3
7756756	FB (186)	< 0.3

Table Note:

\* Missing or Compromised Sample



## ATTACHMENT C

### Laboratory Analytical Results

Radon test result report for:

**MONTGOMERY KNOLLS ELEMENTARY SCHOOL  
MAIN**

Kit #	Room Id	Started	Ended	pCi/L	Analyzed
7756797	MAIN OFC.	2016-05-10 @ 6:00 am	2016-05-13 @ 6:00 am	0.6 ± 0.2	2016-05-17
7756618	MAIN OFC.	2016-05-10 @ 6:00 am	2016-05-13 @ 6:00 am	0.7 ± 0.3	2016-05-17
7756759	100B	2016-05-10 @ 6:00 am	2016-05-13 @ 6:00 am	0.5 ± 0.3	2016-05-17
7756611	100C	2016-05-10 @ 7:00 am	2016-05-13 @ 6:00 am	< 0.3	2016-05-17
7756616	100D	2016-05-10 @ 7:00 am	2016-05-13 @ 6:00 am	< 0.3	2016-05-17
7756606	100F	2016-05-10 @ 7:00 am	2016-05-13 @ 6:00 am	0.7 ± 0.3	2016-05-17
7756612	100H	2016-05-10 @ 7:00 am	2016-05-13 @ 6:00 am	< 0.3	2016-05-17
7756799	100J	2016-05-10 @ 7:00 am	2016-05-13 @ 6:00 am	0.9 ± 0.3	2016-05-17
7756617	100K	2016-05-10 @ 7:00 am	2016-05-13 @ 6:00 am	0.6 ± 0.2	2016-05-17
7756794	101	2016-05-10 @ 7:00 am	2016-05-13 @ 6:00 am	1.0 ± 0.3	2016-05-17
7756796	101	2016-05-10 @ 7:00 am	2016-05-13 @ 6:00 am	0.8 ± 0.3	2016-05-17
7756602	102A	2016-05-10 @ 6:00 am	2016-05-13 @ 6:00 am	0.6 ± 0.3	2016-05-17
7756620	102B	2016-05-10 @ 6:00 am	2016-05-13 @ 6:00 am	0.7 ± 0.3	2016-05-17
7756795	MEDIA1	2016-05-10 @ 7:00 am	2016-05-13 @ 6:00 am	0.9 ± 0.3	2016-05-17
7756800	MEDIA2	2016-05-10 @ 7:00 am	2016-05-13 @ 6:00 am	0.6 ± 0.3	2016-05-17
7756798	103B	2016-05-10 @ 7:00 am	2016-05-13 @ 6:00 am	0.7 ± 0.3	2016-05-17
7756793	103C	2016-05-10 @ 7:00 am	2016-05-13 @ 7:00 am	0.6 ± 0.3	2016-05-17
7756608	104	2016-05-10 @ 7:00 am	2016-05-13 @ 7:00 am	1.0 ± 0.3	2016-05-17
7756609	106	2016-05-10 @ 7:00 am	2016-05-13 @ 7:00 am	< 0.3	2016-05-17
7756779	108	2016-05-10 @ 7:00 am	2016-05-13 @ 7:00 am	0.6 ± 0.3	2016-05-17
7756777	110	2016-05-10 @ 7:00 am	2016-05-13 @ 8:00 am	< 0.3	2016-05-17
7756792	111	2016-05-10 @ 7:00 am	2016-05-13 @ 7:00 am	0.6 ± 0.2	2016-05-17
7756605	112	2016-05-10 @ 7:00 am	2016-05-13 @ 7:00 am	< 0.3	2016-05-17
7756778	113	2016-05-10 @ 8:00 am	2016-05-13 @ 7:00 am	0.8 ± 0.3	2016-05-17
7756773	114	2016-05-10 @ 7:00 am	2016-05-13 @ 8:00 am	< 0.3	2016-05-17
7756774	117	2016-05-10 @ 8:00 am	2016-05-13 @ 7:00 am	0.9 ± 0.3	2016-05-17
7756789	117	2016-05-10 @ 8:00 am	2016-05-13 @ 7:00 am	< 0.3	2016-05-17
7756619	118A	2016-05-10 @ 7:00 am	2016-05-13 @ 7:00 am	0.6 ± 0.2	2016-05-17
7756780	118C	2016-05-10 @ 8:00 am	2016-05-13 @ 7:00 am	0.8 ± 0.2	2016-05-17
7756770	118E	2016-05-10 @ 7:00 am	2016-05-13 @ 7:00 am	0.5 ± 0.2	2016-05-17
7756782	120	2016-05-10 @ 8:00 am	2016-05-13 @ 7:00 am	< 0.3	2016-05-17
7756790	120	2016-05-10 @ 8:00 am	2016-05-13 @ 7:00 am	< 0.3	2016-05-17
7756610	PEP	2016-05-10 @ 8:00 am	2016-05-13 @ 7:00 am	< 0.3	2016-05-17
7756772	122	2016-05-10 @ 8:00 am	2016-05-13 @ 7:00 am	0.7 ± 0.3	2016-05-17
7756776	123	2016-05-10 @ 8:00 am	2016-05-13 @ 7:00 am	0.6 ± 0.2	2016-05-17
7756607	124	2016-05-10 @ 8:00 am	2016-05-13 @ 7:00 am	1.2 ± 0.3	2016-05-17
7756785	125	2016-05-10 @ 8:00 am	2016-05-13 @ 7:00 am	< 0.3	2016-05-17

Radon test result report for:

**MONTGOMERY KNOLLS ELEMENTARY SCHOOL  
MAIN**

Kit #	Room Id	Started	Ended	pCi/L	Analyzed
7756603	127	2016-05-10 @ 8:00 am	2016-05-13 @ 7:00 am	< 0.3	2016-05-17
7756614	127	2016-05-10 @ 8:00 am	2016-05-13 @ 7:00 am	< 0.3	2016-05-17
7756768	128	2016-05-10 @ 8:00 am	2016-05-13 @ 7:00 am	< 0.3	2016-05-17
7756613	130	2016-05-10 @ 8:00 am	2016-05-13 @ 7:00 am	0.7 ± 0.2	2016-05-17
7756604	132	2016-05-10 @ 8:00 am	2016-05-13 @ 7:00 am	0.6 ± 0.2	2016-05-17
7756763	138	2016-05-10 @ 8:00 am	2016-05-13 @ 7:00 am	0.8 ± 0.2	2016-05-17
7756601	140	2016-05-10 @ 8:00 am	2016-05-13 @ 7:00 am	0.5 ± 0.2	2016-05-17
7756788	143	2016-05-10 @ 8:00 am	2016-05-13 @ 7:00 am	0.9 ± 0.3	2016-05-17
7756775	144	2016-05-10 @ 8:00 am	2016-05-13 @ 7:00 am	0.5 ± 0.2	2016-05-17
7756769	146	2016-05-10 @ 8:00 am	2016-05-13 @ 7:00 am	0.6 ± 0.3	2016-05-17
7756771	147	2016-05-10 @ 8:00 am	2016-05-13 @ 7:00 am	0.5 ± 0.2	2016-05-17
7756784	CAFE	2016-05-10 @ 9:00 am	2016-05-13 @ 7:00 am	0.6 ± 0.2	2016-05-17
7756786	CAFE	2016-05-10 @ 9:00 am	2016-05-13 @ 7:00 am	0.8 ± 0.3	2016-05-17
7756765	149B	2016-05-10 @ 9:00 am	2016-05-13 @ 8:00 am	0.9 ± 0.3	2016-05-17
7756757	150	2016-05-10 @ 8:00 am	2016-05-13 @ 7:00 am	< 0.3	2016-05-17
7756791	151	2016-05-10 @ 8:00 am	2016-05-13 @ 7:00 am	0.9 ± 0.3	2016-05-17
7756758	152	2016-05-10 @ 9:00 am	2016-05-13 @ 7:00 am	< 0.3	2016-05-17
7756787	152	2016-05-10 @ 9:00 am	2016-05-13 @ 7:00 am	< 0.3	2016-05-17
7756783	153	2016-05-10 @ 9:00 am	2016-05-13 @ 7:00 am	0.9 ± 0.3	2016-05-17
7756762	154	2016-05-10 @ 9:00 am	2016-05-13 @ 7:00 am	< 0.3	2016-05-17
7756767	157	2016-05-10 @ 8:00 am	2016-05-13 @ 7:00 am	1.0 ± 0.3	2016-05-17
7756764	168	2016-05-10 @ 8:00 am	2016-05-13 @ 7:00 am	0.8 ± 0.2	2016-05-17
7756766	168	2016-05-10 @ 8:00 am	2016-05-13 @ 7:00 am	0.8 ± 0.3	2016-05-17
7756615	168A	2016-05-10 @ 9:00 am	2016-05-13 @ 7:00 am	2.1 ± 0.3	2016-05-17
7756781	170	2016-05-10 @ 9:00 am	2016-05-13 @ 8:00 am	1.3 ± 0.3	2016-05-17
7756754	170C	2016-05-10 @ 9:00 am	2016-05-13 @ 8:00 am	1.3 ± 0.3	2016-05-17
7756645	170D	2016-05-10 @ 9:00 am	2016-05-13 @ 8:00 am	1.1 ± 0.3	2016-05-17
7756644	170E	2016-05-10 @ 9:00 am	2016-05-13 @ 8:00 am	1.1 ± 0.3	2016-05-17
7756650	170F	2016-05-10 @ 9:00 am	2016-05-13 @ 8:00 am	1.3 ± 0.3	2016-05-17
7756649	171	2016-05-10 @ 9:00 am	2016-05-13 @ 7:00 am	0.6 ± 0.2	2016-05-17
7756654	171	2016-05-10 @ 9:00 am	2016-05-13 @ 7:00 am	0.8 ± 0.2	2016-05-17
7756653	173	2016-05-10 @ 9:00 am	2016-05-13 @ 7:00 am	1.2 ± 0.3	2016-05-17
7756643	175	2016-05-10 @ 9:00 am	2016-05-13 @ 7:00 am	1.1 ± 0.3	2016-05-17
7756640	177	2016-05-10 @ 9:00 am	2016-05-13 @ 7:00 am	0.8 ± 0.3	2016-05-17
7756761	BSM	2016-05-10 @ 9:00 am	2016-05-13 @ 6:00 am	0.8 ± 0.3	2016-05-17
7756756	186	2016-05-10 @ 9:00 am	2016-05-13 @ 7:00 am	< 0.3	2016-05-17
7756760	186	2016-05-10 @ 9:00 am	2016-05-13 @ 7:00 am	< 0.3	2016-05-17

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

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Radon test result report for:  
**MONTGOMERY KNOLLS ELEMENTARY SCHOOL  
MAIN**

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Kit #	Room Id	Started	Ended	pCi/L	Analyzed
7756646	188	2016-05-10 @ 9:00 am	2016-05-13 @ 7:00 am	0.5 ± 0.2	2016-05-17
7756651	190	2016-05-10 @ 9:00 am	2016-05-13 @ 7:00 am	1.0 ± 0.3	2016-05-17
7756652	192	2016-05-10 @ 9:00 am	2016-05-13 @ 7:00 am	1.7 ± 0.3	2016-05-17
7756641	194	2016-05-10 @ 9:00 am	2016-05-13 @ 7:00 am	0.7 ± 0.2	2016-05-17
7756642	196	2016-05-10 @ 9:00 am	2016-05-13 @ 7:00 am	0.8 ± 0.3	2016-05-17
7756639	202	2016-05-10 @ 10:00 am	2016-05-13 @ 7:00 am	0.6 ± 0.2	2016-05-17

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

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May 25, 2016

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

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Radon test result report for:

**OFFICE BLANKS**

**Phase 16**

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Kit #	Room Id	Started	Ended	pCi/L	Analyzed
7756628	0	2016-05-10 @ 11:00 am	2016-05-16 @ 11:00 am	< 0.3	2016-05-17
7756801	0	2016-05-16 @ 9:00 am	2016-05-19 @ 9:00 am	0.6 ± 0.3	2016-05-23

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

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May 25, 2016

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

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Radon test result report for:

**TRANSIT BLANKS**

**Phase 16**

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Kit #	Room Id	Started	Ended	pCi/L	Analyzed
7756626	TRANSIT	2016-05-10 @ 11:00 am	2016-05-16 @ 11:00 am	< 0.3	2016-05-17
7756803	TRANSIT	2016-05-16 @ 9:00 am	2016-05-19 @ 9:00 am	< 0.3	2016-05-23

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

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May 27, 2016 **\*\* LABORATORY ANALYSIS  
REPORT \*\***

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

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Kit #	Room Id	Started	Ended	pCi/L	Analyzed
7756802	1	2016-05-20 @ 10:00 am	2016-05-23 @ 10:00 am	22.0 ± 0.7	2016-05-25
7756804	2	2016-05-20 @ 10:00 am	2016-05-23 @ 10:00 am	23.7 ± 0.7	2016-05-25
7756805	3	2016-05-20 @ 10:00 am	2016-05-23 @ 10:00 am	22.9 ± 0.7	2016-05-25
7756809	4	2016-05-20 @ 10:00 am	2016-05-23 @ 10:00 am	24.3 ± 0.7	2016-05-25
7756810	5	2016-05-20 @ 10:00 am	2016-05-23 @ 10:00 am	25.1 ± 0.7	2016-05-25
7756811	6	2016-05-20 @ 10:00 am	2016-05-23 @ 10:00 am	22.4 ± 0.7	2016-05-25

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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 175202

NOMINAL Conditions: Radon Conc 25.6 pCi/L Rel. Hum 48.2 % Temp. 79.0 F

Date Start: 5/20/16 Date Stop: 5/23/16 Date Start: \_\_\_\_\_ Date Stop: \_\_\_\_\_

Time Start: 1026 Time Stop: 1026 Time Start: \_\_\_\_\_ Time Stop: \_\_\_\_\_

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

7756802, 7756804, 7756805, \_\_\_\_\_

7756809 thru 7756811 \_\_\_\_\_

E3 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 16

Name of Schools:

1. Montgomery Knolls ES

---

	Date	Initials
Radon Test Kits Deployed	5/10/16	JM
Radon Test Kits Collected	5/13/16	JM
Radon Test Kits Shipped to Lab*	5/16/16	JM
Radon Test Kits Received by Lab*	5/17/16	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 16

Name of Schools:

1. DuFief ES

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	Date	Initials
Radon Test Kits Deployed	5/16/16	JM
Radon Test Kits Collected	5/19/16	JM
Radon Test Kits Shipped to Lab*	5/19/16	JM
Radon Test Kits Received by Lab*	5/23/16	JM

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

# RADON SCREENING SURVEY – FOLLOW-UP MONTGOMERY KNOLLS ELEMENTARY SCHOOL

807 Daleview Drive, Silver Spring, Maryland 20901

## EXECUTIVE SUMMARY

Date of Test Report:	3/10/16 (Rev 1) Follow-Up
Round of Testing:	Initial Follow-up Post Remediation
# Rooms Tested	10
# Rooms $\geq$ 4.0 pCi/L:	4
Low Value:	<0.3
High Value:	12.6
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) 3/3/16 (Rev 1. Initial)	Result (pCi/L) 3/7/16 (Follow-Up)	Average Result (pCi/L)
100B	6.2	4.5	5.4
100D	5.3	5.0	5.2
Media 2	5.0	3.4	4.2
Media 2	3.3	4.7	4.0
157	4.1	2.2	3.2
168	missing	1.5	1.5
194	missing	<0.3	<0.3
100I	3.5	3.0	3.3
102A	3.8	3.7	3.8
102B	3.2	3.2	3.2
117	3.9	12.6	8.3



## MCPS RADON TESTING

### Executive Summary: Montgomery Knolls Elementary School

Date of Test Report:	3/10/2016 (Rev 1)
Round of Testing:	Initial Follow-up Post Remediation
# Rooms Tested:	10
# Rooms $\geq$ 4.0 pCi/L:	4
Low Value:	< 0.3
High Value:	12.6

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

Room 117 (12.6 pCi/L), Room 100B (5.4 pCi/L), Room 100D (5.0 pCi/L), Media 2 (4.7 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.



March 10, 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 # 12146341.28

Location: Montgomery Knolls Elementary School  
807 Daleview Drive  
Silver Spring, MD 20901

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 Montgomery Knolls Elementary School, located at 807 Daleview Drive in Silver Spring, Maryland 20901 (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 fifteen (15) 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  $\leq 65^{\circ}\text{F}$ .

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>	117	12.6
	100B	4.5, 5.4(D)
	100D	5.0
	Media 2	4.7
<b><math>&lt; 4.0</math> pCi/L</b>	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. Moulds  
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.

Radon Testing Results		
Montgomery Knolls Elementary School		
Test Period: 02/08/16-02/11/16		
Kit Number	Room / Area	Result
7730278	117	12.6
7730272	157	2.2
7730279	168	1.5
7730280	168	1.2
7730281	194	< 0.3
7730267	100B	4.5
7730270	100D	5.0
7730274	100I	3.0
7730275	102A	3.7
7730276	102B	3.2
7730277	MEDIA 2	4.7
7730273	MEDIA 2	3.4

Table Note:

\* Missing or Compromised Sample

Radon Testing Results		
Montgomery Knolls Elementary School		
Test Period: 02/08/16-02/11/16		
Kit Number	QC Type	Result
7730268	D (100B)	5.4
7730271	D (157)	2.0
7730269	FB (100B)	< 0.3

Table Note:

\* Missing or Compromised Sample

## ATTACHMENT C

### Laboratory Analytical Results

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February 25, 2016

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

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Radon test result report for:

**MONTGOMERY KNOLLS ELEMENTARY SCHOOL  
MAIN**

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Kit #	Room Id	Started	Ended	pCi/L	Analyzed
7730267	100B	2016-02-08 @ 8:00 am	2016-02-11 @ 7:00 am	4.5 ± 0.5	2016-02-15
7730268	100B	2016-02-08 @ 9:00 am	2016-02-11 @ 7:00 am	5.4 ± 0.6	2016-02-15
7730269	100B	2016-02-08 @ 9:00 am	2016-02-11 @ 7:00 am	< 0.3	2016-02-15
7730270	100D	2016-02-08 @ 9:00 am	2016-02-11 @ 7:00 am	5.0 ± 0.5	2016-02-15
7730274	100I	2016-02-08 @ 9:00 am	2016-02-11 @ 7:00 am	3.0 ± 0.4	2016-02-15
7730275	102A	2016-02-08 @ 9:00 am	2016-02-11 @ 7:00 am	3.7 ± 0.5	2016-02-15
7730276	102B	2016-02-08 @ 9:00 am	2016-02-11 @ 7:00 am	3.2 ± 0.4	2016-02-15
7730278	117	2016-02-08 @ 9:00 am	2016-02-11 @ 7:00 am	12.6 ± 0.9	2016-02-15
7730271	157	2016-02-08 @ 9:00 am	2016-02-11 @ 7:00 am	2.0 ± 0.4	2016-02-15
7730272	157	2016-02-08 @ 9:00 am	2016-02-11 @ 7:00 am	2.2 ± 0.4	2016-02-15
7730279	168	2016-02-08 @ 9:00 am	2016-02-11 @ 7:00 am	1.5 ± 0.3	2016-02-15
7730280	168	2016-02-08 @ 9:00 am	2016-02-11 @ 7:00 am	1.2 ± 0.3	2016-02-15
7730281	194	2016-02-08 @ 9:00 am	2016-02-11 @ 8:00 am	< 0.3	2016-02-15
7730277	MEDIA 2	2016-02-08 @ 9:00 am	2016-02-11 @ 7:00 am	4.7 ± 0.5	2016-02-15
7730273	MEDIA 2	2016-02-08 @ 9:00 am	2016-02-11 @ 7:00 am	3.4 ± 0.5	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**

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Kit #	Room Id	Started	Ended	pCi/L	Analyzed
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

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**

Kit #	Room Id	Started	Ended	pCi/L	Analyzed
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

3 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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Corporate Office: 936 Ridgebrook road • Sparks , Maryland 21152 • 410-316-7800 • (Fax) 410-316-7935

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## 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        |

---

	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: Montgomery Knolls Elementary School

Date of Test Report:	3/3/2016 (Rev 1)
Round of Testing:	Initial Follow-up Post Remediation
# Rooms Tested:	73
# Rooms $\geq 4.0$ pCi/L:	4
Low Value:	< 0.3
High Value:	6.2

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

Room 100B (6.2 pCi/L), Room 100D (5.3 pCi/L), Media 2 (5.0 pCi/L), Room 157 (4.1 pCi/L),

Project Status:

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

Initial testing completed; missing or compromised samples need re-test.



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936 RIDGEBROOK ROAD • SPARKS, MD 21152 • 410-316-7800 • (FAX) 410-316-7935

March 3, 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 # 12146341.20

Location: Montgomery Knolls Elementary School  
807 Daleview Drive  
Silver Spring, MD 20901

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 Montgomery Knolls Elementary School, located at 807 Daleview Drive in Silver Spring, Maryland 20901 (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 21, 2015 and deployed eighty-eight (88) 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 24, 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  $\leq 65^{\circ}\text{F}$ .

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>	100B	6.2
	100D	5.3
	Media 2	5.0
	157	4.1
<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. Moulds  
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

Radon Testing Results		
Montgomery Knoll ES		
Test Period: 12/21/15-12/24/15		
Kit Number	Room / Area	Result
7713349	101	1.9
7713358	104	1.5
7713350	106	1.3
7713352	108	1.4
7713354	110	1.3
7713361	111	2.4
7713356	112	1.5
7713364	113	2.0
7713360	114	1.6
7713414	117	3.9
7713365	118	1.3
7713377	120	1.5
7713366	121	1.9
7713367	122	1.6
7713368	123	2.0
7713378	124	1.9
7713371	125	0.8
7713363	127	0.9
7713372	128	1.3
7713369	130	1.2
7713370	132	0.8
7713385	133	2.4
7713382	138	1.1
7713388	140	1.2
7713389	143	1.0
7713396	144	1.2
7713398	146	1.4
7713392	147	0.7
7713390	150	1.7
7713391	151	1.9
7713394	152	< 0.3
7713397	153	2.3
7713400	154	0.7
7713393	157	4.1
7713416	170	1.3
7713381	171	0.8
7713373	173	1.0
7713375	175	1.2
7713376	177	1.2
7713422	186	< 0.3
7713383	188	< 0.3
7713380	190	0.9
7713379	192	1.8
7713384	196	0.7
7713412	202	0.9
7713340	100A	3.1

Table Note:

\* Missing or Compromised Sample

Radon Testing Results		
Montgomery Knoll Es		
Test Period: 12/21/15-12/24/15		
Kit Number	Room / Area	Result
7713346	100B	6.2
7713344	100C	2.5
7713347	100D	5.3
7713343	100F	2.7
7713348	100H	2.0
7713353	100I	3.5
7713351	100J	2.4
7713339	100K	2.7
7713321	102A	3.8
7713337	102B	3.2
7713420	118C	1.0
7713419	118E	1.2
7713428	149B	1.1
7713418	* 168 (missing)	-
7713413	168A	2.9
7713427	170C	1.4
7713404	170D	< 0.3
7713410	170E	1.3
7713424	170F	1.7
7713374	171A	0.6
7713386	* 194 (missing)	-
7713399	BSM	1.1
7713387	CAFE	1.4
7713426	CAFÉ	1.3
7713345	MAIN OFFICE	2.1
7713359	MEDIA 1	1.9
7713357	MEDIA 2	3.3
7713355	MEDIA 2	5.0
7713362	PEP	1.6

Table Note:

\* Missing or Compromised Sample

Radon Testing Results		
Montgomery Knoll ES		
Test Period: 12/21/15-12/24/15		
Kit Number	QC Type	Result
7713334	D (100A)	2.7
7713341	D (102B)	3.3
7713402	D (110)	1.4
7713408	D (111)	2.0
7713403	D (112)	1.9
7713406	D (114)	1.5
7713425	D (170C (MONT KNOLL)	1.0
7713405	D (170D (MONT KNOLL)	0.5
7713342	D (MAIN OFFICE)	1.9
7713338	FB (102A)	2.6
7713411	FB (104)	< 0.3
7713409	FB (106)	< 0.3
7707320	OB (0)	< 0.3

Table Note:

\* Missing or Compromised Sample

## ATTACHMENT C

### Laboratory Analytical Results

Radon test result report for:  
**MONTGOMERY KNOLL ES**  
**MAIN**

Kit #	Room Id	Started	Ended	pCi/L	Analyzed
7707320	0	2015-12-21 @ 12:00 pm	2015-12-24 @ 12:00 pm	< 0.3	2015-12-29
7713334	100A	2015-12-21 @ 11:00 am	2015-12-24 @ 10:00 am	2.7 ± 0.4	2015-12-29
7713340	100A	2015-12-21 @ 11:00 am	2015-12-24 @ 10:00 am	3.1 ± 0.5	2015-12-29
7713346	100B	2015-12-21 @ 11:00 am	2015-12-24 @ 10:00 am	6.2 ± 0.6	2015-12-29
7713344	100C	2015-12-21 @ 11:00 am	2015-12-24 @ 9:00 am	2.5 ± 0.4	2015-12-29
7713347	100D	2015-12-21 @ 11:00 am	2015-12-24 @ 9:00 am	5.3 ± 0.6	2015-12-29
7713343	100F	2015-12-21 @ 11:00 am	2015-12-24 @ 9:00 am	2.7 ± 0.5	2015-12-29
7713348	100H	2015-12-21 @ 11:00 am	2015-12-24 @ 9:00 am	2.0 ± 0.4	2015-12-29
7713353	100I	2015-12-21 @ 11:00 am	2015-12-24 @ 9:00 am	3.5 ± 0.5	2015-12-29
7713351	100J	2015-12-21 @ 11:00 am	2015-12-24 @ 10:00 am	2.4 ± 0.4	2015-12-29
7713339	100K	2015-12-21 @ 11:00 am	2015-12-24 @ 9:00 am	2.7 ± 0.4	2015-12-29
7713349	101	2015-12-21 @ 11:00 am	2015-12-24 @ 9:00 am	1.9 ± 0.4	2015-12-29
7713321	102A	2015-12-21 @ 11:00 am	2015-12-24 @ 10:00 am	3.8 ± 0.5	2015-12-29
7713338	102A	2015-12-21 @ 11:00 am	2015-12-24 @ 10:00 am	2.6 ± 0.4	2015-12-29
7713337	102B	2015-12-21 @ 11:00 am	2015-12-24 @ 10:00 am	3.2 ± 0.5	2015-12-29
7713341	102B	2015-12-21 @ 11:00 am	2015-12-24 @ 10:00 am	3.3 ± 0.5	2015-12-29
7713411	104	2015-12-21 @ 12:00 pm	2015-12-24 @ 9:00 am	< 0.3	2015-12-28
7713358	104	2015-12-21 @ 11:00 am	2015-12-24 @ 9:00 am	1.5 ± 0.4	2015-12-29
7713409	106	2015-12-21 @ 12:00 pm	2015-12-24 @ 9:00 am	< 0.3	2015-12-29
7713350	106	2015-12-21 @ 11:00 am	2015-12-24 @ 9:00 am	1.3 ± 0.4	2015-12-29
7713352	108	2015-12-21 @ 11:00 am	2015-12-24 @ 9:00 am	1.4 ± 0.4	2015-12-29
7713354	110	2015-12-21 @ 11:00 am	2015-12-24 @ 9:00 am	1.3 ± 0.4	2015-12-29
7713402	110	2015-12-21 @ 12:00 pm	2015-12-24 @ 9:00 am	1.4 ± 0.4	2015-12-29
7713408	111	2015-12-21 @ 12:00 pm	2015-12-24 @ 9:00 am	2.0 ± 0.4	2015-12-29
7713361	111	2015-12-21 @ 11:00 am	2015-12-24 @ 9:00 am	2.4 ± 0.4	2015-12-29
7713403	112	2015-12-21 @ 12:00 pm	2015-12-24 @ 9:00 am	1.9 ± 0.3	2015-12-28
7713356	112	2015-12-21 @ 11:00 am	2015-12-24 @ 9:00 am	1.5 ± 0.4	2015-12-29
7713364	113	2015-12-21 @ 12:00 pm	2015-12-24 @ 9:00 am	2.0 ± 0.4	2015-12-29
7713406	114	2015-12-21 @ 12:00 pm	2015-12-24 @ 9:00 am	1.5 ± 0.4	2015-12-29
7713360	114	2015-12-21 @ 11:00 am	2015-12-24 @ 9:00 am	1.6 ± 0.4	2015-12-29
7713414	117	2015-12-21 @ 2:00 pm	2015-12-24 @ 9:00 am	3.9 ± 0.5	2015-12-29
7713365	118	2015-12-21 @ 12:00 pm	2015-12-24 @ 9:00 am	1.3 ± 0.4	2015-12-29
7713420	118C	2015-12-21 @ 2:00 pm	2015-12-24 @ 9:00 am	1.0 ± 0.3	2015-12-29
7713419	118E	2015-12-21 @ 2:00 pm	2015-12-24 @ 9:00 am	1.2 ± 0.4	2015-12-29
7713377	120	2015-12-21 @ 12:00 pm	2015-12-24 @ 9:00 am	1.5 ± 0.4	2015-12-29
7713366	121	2015-12-21 @ 12:00 pm	2015-12-24 @ 9:00 am	1.9 ± 0.4	2015-12-29
7713367	122	2015-12-21 @ 12:00 pm	2015-12-24 @ 9:00 am	1.6 ± 0.4	2015-12-29

Radon test result report for:  
**MONTGOMERY KNOLL ES**  
**MAIN**

Kit #	Room Id	Started	Ended	pCi/L	Analyzed
7713368	123	2015-12-21 @ 12:00 pm	2015-12-24 @ 9:00 am	2.0 ± 0.4	2015-12-29
7713378	124	2015-12-21 @ 12:00 pm	2015-12-24 @ 9:00 am	1.9 ± 0.4	2015-12-29
7713371	125	2015-12-21 @ 12:00 pm	2015-12-24 @ 9:00 am	0.8 ± 0.3	2015-12-29
7713363	127	2015-12-21 @ 12:00 pm	2015-12-24 @ 9:00 am	0.9 ± 0.4	2015-12-29
7713372	128	2015-12-21 @ 12:00 pm	2015-12-24 @ 9:00 am	1.3 ± 0.4	2015-12-29
7713369	130	2015-12-21 @ 12:00 pm	2015-12-24 @ 9:00 am	1.2 ± 0.4	2015-12-29
7713370	132	2015-12-21 @ 12:00 pm	2015-12-24 @ 9:00 am	0.8 ± 0.3	2015-12-29
7713385	133	2015-12-21 @ 12:00 pm	2015-12-24 @ 9:00 am	2.4 ± 0.4	2015-12-29
7713382	138	2015-12-21 @ 12:00 pm	2015-12-24 @ 9:00 am	1.1 ± 0.4	2015-12-29
7713388	140	2015-12-21 @ 12:00 pm	2015-12-24 @ 9:00 am	1.2 ± 0.4	2015-12-29
7713389	143	2015-12-21 @ 12:00 pm	2015-12-24 @ 9:00 am	1.0 ± 0.3	2015-12-28
7713396	144	2015-12-21 @ 12:00 pm	2015-12-24 @ 9:00 am	1.2 ± 0.4	2015-12-29
7713398	146	2015-12-21 @ 12:00 pm	2015-12-24 @ 9:00 am	1.4 ± 0.4	2015-12-29
7713392	147	2015-12-21 @ 12:00 pm	2015-12-24 @ 9:00 am	0.7 ± 0.3	2015-12-29
7713428	149B	2015-12-21 @ 2:00 pm	2015-12-24 @ 9:00 am	1.1 ± 0.3	2015-12-28
7713390	150	2015-12-21 @ 12:00 pm	2015-12-24 @ 9:00 am	1.7 ± 0.4	2015-12-29
7713391	151	2015-12-21 @ 12:00 pm	2015-12-24 @ 9:00 am	1.9 ± 0.4	2015-12-29
7713394	152	2015-12-21 @ 12:00 pm	2015-12-24 @ 9:00 am	< 0.3	2015-12-29
7713397	153	2015-12-21 @ 12:00 pm	2015-12-24 @ 9:00 am	2.3 ± 0.4	2015-12-28
7713400	154	2015-12-21 @ 12:00 pm	2015-12-24 @ 9:00 am	0.7 ± 0.3	2015-12-29
7713393	157	2015-12-21 @ 12:00 pm	2015-12-24 @ 9:00 am	4.1 ± 0.4	2015-12-28
7713418	168	@	@		
7713413	168A	2015-12-21 @ 12:00 pm	2015-12-24 @ 9:00 am	2.9 ± 0.4	2015-12-28
7713416	170	2015-12-21 @ 12:00 pm	2015-12-24 @ 9:00 am	1.3 ± 0.3	2015-12-28
7713427	170C	2015-12-21 @ 2:00 pm	2015-12-24 @ 9:00 am	1.4 ± 0.3	2015-12-28
7713404	170D	2015-12-21 @ 2:00 pm	2015-12-24 @ 9:00 am	< 0.3	2015-12-28
7713410	170E	2015-12-21 @ 2:00 pm	2015-12-24 @ 9:00 am	1.3 ± 0.3	2015-12-28
7713424	170F	2015-12-21 @ 2:00 pm	2015-12-24 @ 9:00 am	1.7 ± 0.3	2015-12-28
7713381	171	2015-12-21 @ 12:00 pm	2015-12-24 @ 9:00 am	0.8 ± 0.3	2015-12-28
7713374	171A	2015-12-21 @ 12:00 pm	2015-12-24 @ 9:00 am	0.6 ± 0.3	2015-12-28
7713373	173	2015-12-21 @ 12:00 pm	2015-12-24 @ 10:00 am	1.0 ± 0.4	2015-12-29
7713375	175	2015-12-21 @ 12:00 pm	2015-12-24 @ 10:00 am	1.2 ± 0.4	2015-12-29
7713376	177	2015-12-21 @ 12:00 pm	2015-12-24 @ 10:00 am	1.2 ± 0.4	2015-12-29
7713422	186	2015-12-21 @ 12:00 pm	2015-12-24 @ 9:00 am	< 0.3	2015-12-28
7713383	188	2015-12-21 @ 12:00 pm	2015-12-24 @ 9:00 am	< 0.3	2015-12-28
7713380	190	2015-12-21 @ 12:00 pm	2015-12-24 @ 10:00 am	0.9 ± 0.3	2015-12-29
7713379	192	2015-12-21 @ 12:00 pm	2015-12-24 @ 10:00 am	1.8 ± 0.4	2015-12-29



Radon test result report for:  
**MONTGOMERY KNOLL ES**  
**MAIN**

Kit #	Room Id	Started	Ended	pCi/L	Analyzed
7713386	194	@	@		
7713384	196	2015-12-21 @ 12:00 pm	2015-12-24 @ 10:00 am	0.7 ± 0.3	2015-12-29
7713412	202	2015-12-21 @ 12:00 pm	2015-12-24 @ 9:00 am	0.9 ± 0.3	2015-12-29
7713399	BSM	2015-12-21 @ 12:00 pm	2015-12-24 @ 9:00 am	1.1 ± 0.3	2015-12-28
7713387	CAFE	2015-12-21 @ 12:00 pm	2015-12-24 @ 9:00 am	1.4 ± 0.3	2015-12-28
7713426	CAFE	2015-12-21 @ 2:00 pm	2015-12-24 @ 9:00 am	1.3 ± 0.4	2015-12-29
7713342	MAIN OFFICE	2015-12-21 @ 11:00 am	2015-12-24 @ 10:00 am	1.9 ± 0.4	2015-12-29
7713345	MAIN OFFICE	2015-12-21 @ 11:00 am	2015-12-24 @ 10:00 am	2.1 ± 0.4	2015-12-29
7713359	MEDIA 1	2015-12-21 @ 11:00 am	2015-12-24 @ 9:00 am	1.9 ± 0.4	2015-12-29
7713357	MEDIA 2	2015-12-21 @ 11:00 am	2015-12-24 @ 9:00 am	3.3 ± 0.5	2015-12-29
7713355	MEDIA 2	2015-12-21 @ 11:00 am	2015-12-24 @ 9:00 am	5.0 ± 0.6	2015-12-29
7713362	PEP	2015-12-21 @ 12:00 pm	2015-12-24 @ 9:00 am	1.6 ± 0.4	2015-12-29

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January 12, 2016

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

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Radon test result report for:  
**MONTGOMERY KNOLL ES  
MAIN (MONTGOMERY KNOLL)**

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Kit #	Room Id	Started	Ended	pCi/L	Analyzed
7713425	170C (MONT KNOLL	2015-12-21 @ 2:00 pm	2015-12-24 @ 9:00 am	1.0 ± 0.3	2015-12-28
7713405	170D (MONT KNOLL	2015-12-21 @ 2:00 pm	2015-12-24 @ 9:00 am	0.5 ± 0.3	2015-12-28

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

December  
29,  
2015

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

Radon test result report for:  
**TRANSIT DEC 14 2015**  
**NONE**

Kit #	Room Id	Started	Ended	pCi/L	Analyzed
7704395	TRANSIT 1	2015-12-13 @ 10:00 am	2015-12-15 @ 10:00 am	< 0.3	2015-12-16
7706508	TRANSIT 10	2015-12-13 @ 10:00 am	2015-12-15 @ 10:00 am	< 0.3	2015-12-16
7706510	TRANSIT 11	2015-12-13 @ 10:00 am	2015-12-15 @ 10:00 am	< 0.3	2015-12-16
7706511	TRANSIT 12	2015-12-13 @ 10:00 am	2015-12-15 @ 10:00 am	< 0.3	2015-12-16
7706505	TRANSIT 13	2015-12-13 @ 10:00 am	2015-12-15 @ 10:00 am	< 0.3	2015-12-16
7704371	TRANSIT 14	2015-12-13 @ 10:00 am	2015-12-15 @ 10:00 am	< 0.3	2015-12-16
7706506	TRANSIT 15	2015-12-13 @ 10:00 am	2015-12-15 @ 10:00 am	< 0.3	2015-12-16
7704381	TRANSIT 16	2015-12-13 @ 10:00 am	2015-12-15 @ 10:00 am	< 0.3	2015-12-16
7704399	TRANSIT 17	2015-12-13 @ 10:00 am	2015-12-15 @ 10:00 am	< 0.3	2015-12-16
7704390	TRANSIT 18	2015-12-13 @ 10:00 am	2015-12-15 @ 10:00 am	< 0.3	2015-12-16
7704396	TRANSIT 2	2015-12-13 @ 10:00 am	2015-12-15 @ 10:00 am	< 0.3	2015-12-16
7704364	TRANSIT 3	2015-12-13 @ 10:00 am	2015-12-15 @ 10:00 am	< 0.3	2015-12-16
7704370	TRANSIT 4	2015-12-13 @ 10:00 am	2015-12-15 @ 10:00 am	< 0.3	2015-12-16
7704368	TRANSIT 5	2015-12-13 @ 10:00 am	2015-12-15 @ 10:00 am	< 0.3	2015-12-16
7706524	TRANSIT 6	2015-12-13 @ 10:00 am	2015-12-15 @ 10:00 am	< 0.3	2015-12-16
7706526	TRANSIT 7	2015-12-13 @ 10:00 am	2015-12-15 @ 10:00 am	< 0.3	2015-12-16
7706518	TRANSIT 8	2015-12-13 @ 10:00 am	2015-12-15 @ 10:00 am	< 0.3	2015-12-16
7706516	TRANSIT 9	2015-12-13 @ 10:00 am	2015-12-15 @ 10:00 am	< 0.3	2015-12-16

December  
23,  
2015

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

Spike Sample Laboratory Results

Radon test result report for:  
**MCPS**

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

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

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

# EXPOSURE IN BOWSER-MORNER RADON CHAMBER

CLIENT KCI Technologies Inc. Job Number 173224

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

Date Start: 12/18/15 Date Stop: 12/21/15 Date Start: \_\_\_\_\_ Date Stop: \_\_\_\_\_

Time Start: 0929 Time Stop: 0929 Time Start: \_\_\_\_\_ Time Stop: \_\_\_\_\_

Device No.'s: 7705132, 7706208, Device No.'s: \_\_\_\_\_

7706211, 7706366, \_\_\_\_\_

7706380, 7706381 \_\_\_\_\_

F3 Left

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

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

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

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

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

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

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



ENGINEERS • PLANNERS • SCIENTISTS • CONSTRUCTION MANAGERS

Corporate Office: 936 Ridgebrook road • Sparks , Maryland 21152 • 410-316-7800 • (Fax) 410-316-7935

## Chain of Custody

Project Name: MCPS Radon Phase II

School Names:

- |                           |                             |                           |
|---------------------------|-----------------------------|---------------------------|
| 1. Bannockburn ES         | 11. Sherwood HS             | 21. Fairland ES           |
| 2. Walt Whitman HS        | 12. Hadley Farms            | 22. Cannon Road ES        |
| 3. Walter Johnson HS      | 13. S. Christa McAuliffe ES | 23. Richard Montgomery HS |
| 4. North Chevy Chase ES   | 14. Ronald A. McNair ES     | 24. Brooke Grove ES       |
| 5. Piney Branch ES        | 15. MLK MS                  | 25. Belmont ES            |
| 6. Forest Knolls ES       | 16. Ashburton ES            | 26. Emory Grove           |
| 7. Newport Mill MS        | 17. Bradley Hills ES        | 27. Clarksburg HS         |
| 8. Broad Acres ES         | 18. Flora M. Singer ES      | 28. Clarksburg ES         |
| 9. Briggs Chaney MS       | 19. Woodlin ES              | 29. John T. Baker MS      |
| 10. Blair G. Ewing Center | 20. Montgomery Knolls ES    |                           |

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	Date	Initials
Radon Test Kits Deployed	12/21/2015	JM
Radon Test Kits Collected	12/24/2015	JM
Radon Test Kits Shipped to Lab*	12/24/2015	JM
Radon Test Kits Received by Lab*	12/28/2015	JM

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

## M. A. CECIL & ASSOCIATES, INC.

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

### MCPS RADON TESTING

#### Executive Summary

Name of Facility	Montgomery Knolls Elementary
Date of Test report	November 19, 2015
Round of Testing	Initial
Number of rooms tested	12
Number of room $\geq 4.0$	0
Low value	1.1
High value	3.2

**M. A. CECIL & ASSOCIATES, INC.**  
4475 Shannon Way, Port Republic, Maryland 20676 (301) 855-7710  
INDUSTRIAL HYGIENE AND ENVIRONMENTAL HEALTH

November 19, 2015

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

Re: Radon Evaluation - Montgomery Knolls Elementary School

Dear Mr. Yarup:

Environmental radon testing has been completed in the new wing of Montgomery Knolls Elementary School.

Twelve charcoal canisters were placed in various rooms in the new wing. The canisters were placed on November 6, 2015 and retrieved on November 9, 2015. The detected radon concentrations were below the EPA recommended level of 4.0 pico curries per liter (pCi/l) of air with one exception. The canister placed in the cafeteria was missing on the canister retrieval date. Test locations and results are summarized in the table below.

Location	Detected Radon Concentration (pCi/l)
Cafeteria	*
Gym	3.2
Music Room	2.4
Staff Lounge A	1.1
Staff Lounge B (Quality control)	1.2
Room 138	2.2
Room 140	1.9
Room 143	3.1
Room 144	2.1
Room 146	2.0
Room 147	1.6
Room 150	2.8

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

Sincerely,

*Michael A. Cecil*  
Michael A. Cecil, CIH



# A.B.E. Radiation Measurements Laboratory

Division of Health Physics Associates, Inc.

1005 Old 22 PO Box 214 Lenhartsville, PA 19534

dee@radprotection.com

(610) 756-4153 (Voice) (610) 756-0042 (FAX)

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November 18, 2015

MA Cecil & Associates, Inc.  
4475 Shannon Way  
Port Republic, MD 20676

Attn: Kimberly Tayman

re: **Radon Sampling**, Montgomery Knolls Elementary School,  
807 Daleview Dr., Silver Spring, MD 20901.

**Dates of tests:** November 6 to 9, 2015

**Chamber Spikes:** 3.5 % Deviation; August 11 to 13, 2015

Dear Ms. Tayman:

The following is a report of the radon sampling your company conducted at the referenced property using activated charcoal. The charcoal analysis procedures have passed the US EPA's Radon Measurement Proficiency Testing program, and A.B.E. Radiation Measurements Lab is certified by the PA DEP as a laboratory (certification number 0048). The table lists each sample location and the net radon levels in picocuries per liter (pCi/l). Screening testing should be conducted under "closed house" conditions; however, A.B.E. Radiation Measurements Laboratory has no control over how the test device is treated in our absence or the degree of ventilation at the property over the course of the test.

<b>Canister Number</b>	<b>Location</b>	<b>Start Time</b>	<b>End Time</b>	<b>pCi/l</b>
*172710	Cafeteria	17:55	N/A	N/A
172720	Music Room	17:56	06:06	2.4
172714	Room 138	17:57	06:07	2.2
172738	Room 140	17:58	06:07	1.9
172711	Room 144	17:59	06:08	2.1
172713	Room 146	17:59	06:09	2.0
172708	Room 150	18:01	06:11	2.8
172753	Room 143	18:01	06:10	3.1
168940	Room 147	18:02	06:12	1.6
172783	Gym	18:05	06:14	3.2
172788	Staff Lounge A	18:07	06:16	1.1
172715	Staff Lounge B	18:07	06:16	1.2

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\*Canister missing at pick up.

### **CONCLUSIONS**


The radon concentrations measured during the test were below the US EPA screening guideline of less than 4.0 pCi/l and remedial action to reduce the radon concentration is not indicated based on the results of this test. Because of the variability of radon air concentrations over the course of a year, follow-up biannual testing during a different season, under occupied conditions, is recommended to better estimate the annual average air concentrations.

The results of this test are valid only for the date, time and conditions under which the test was conducted and only for the client ordering the test.

Should you wish to discuss this report, please do not hesitate to contact us at (610) 756-4153.

Thank you for the opportunity to serve you.

Sincerely,

A handwritten signature in black ink that reads "A La Mastra". The signature is written in a cursive, flowing style.

A. LaMastra  
President