

## School / Facility Radon Testing Report Form

School Year: **24-25**

Facility:	DuFief Elementary School		
Address:	15001 DuFief Dr.		
	North Potomac, MD 20878		
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 checked="" 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	56	Lowest Value (pCi/L)	<0.3
Number of Rooms ( $\geq 4.0$ -pCi/L)	0	Highest Value (pCi/L)	0.6

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

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

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

Attachment 2 – Laboratory Report(s)

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

### Detector and Deployment

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

### Testing

<input checked="" type="checkbox"/> Short-Term <input type="checkbox"/> Long-Term	Length of Test (days):	3	Date of Deployment and Retrieval (mm/dd/yy):	1/28/2025
				1/31/2025
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>	56	0	0	0	56
Duplicates <sup>2</sup>	6	0	0	0	6
Field Blanks <sup>3</sup>	3	0	0	0	3
Grand Total					65

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

2 - 10% of all locations tested, per floor

3 – 5% of all locations tested, per floor

**Quality Assurance / Quality Control (QA/QC)**

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

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

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

2 – One per shipping container from start of detector deployment

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

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

**Quality Assurance / Quality Control** (continued)

Spike Sample Lab Results. Measured values are satisfactory, i.e., within $\pm 25\%$ of the chamber's reference value?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No
Quality Control measurements comply with QA/QC requirements in the submitted testing organization's/company's QA plan?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No
<b>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:	56	0	0	0	56
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
<b>If Yes to both above – then Testing Status – ‘No Further Testing Needed’ mark ‘NA’ below and complete Conclusions section</b>			
<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>If Yes, then - ‘No Further Testing Needed’ complete Conclusion section on first page.</b> <b>If No, then - ‘Follow-up Testing Required’ continue below.</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		
Dufief Elementary School		
Test Period: 1/28/2025 - 1/31/2025		
Kit Number	Room / Area	Result
11926681	102	< 0.3
11951580	103	< 0.3
11926684	104	< 0.3
11951579	105	< 0.3
11926686	106	< 0.3
11951553	107	< 0.3
11926685	109	< 0.3
11926697	110	< 0.3
11926687	111	< 0.3
11926688	111	< 0.3
11926694	112	< 0.3
11926690	113	< 0.3
11926696	114	< 0.3
11926695	119	< 0.3
11926656	120	< 0.3
11926663	121	< 0.3
11926664	121	< 0.3
11926698	121	< 0.3
11926693	122	< 0.3
11926692	123	< 0.3
11926672	124	< 0.3
11926647	125	< 0.3
11926655	126	< 0.3
11951594	130	< 0.3
11951595	130	< 0.3
11951596	131	< 0.3
11951592	132	< 0.3
11951591	133	< 0.3
11951589	134	< 0.3
11951590	135	< 0.3
11951593	136	< 0.3
11903975	143	< 0.3
11926671	144	< 0.3
11926700	145	< 0.3
11926670	146	< 0.3
11903973	147	< 0.3
11951584	147	< 0.3

Table 1- Radon Testing Results		
Dufief Elementary School		
Test Period: 1/28/2025 - 1/31/2025		
Kit Number	Room / Area	Result
11951597	148	0.6
11903970	149	< 0.3
11926677	150	< 0.3
11906881	151	< 0.3
11906888	159	< 0.3
11906872	160	< 0.3
11906879	160	< 0.3
11951583	160	< 0.3
11906889	161	< 0.3
11926680	100A	< 0.3
11906890	100C	< 0.3
11926683	100E	< 0.3
11926682	102C	< 0.3
11926679	102D	< 0.3
11951581	140A	< 0.3
11951578	140C	< 0.3
11951587	140C	< 0.3
11951588	140C	< 0.3
11926689	140D	< 0.3
11906887	APR	< 0.3
11951585	APR	< 0.3
11906882	GYM	< 0.3
11951600	GYM	< 0.3
11951586	GYM OFFICE	< 0.3
11926678	MAIN OFFICE	< 0.3
11926691	MEDIA CENTER	< 0.3
11951577	MEDIA CENTER	< 0.3
11906880	STAGE	< 0.3

[illegible]

Table 3 - QC Radon Testing Results			
Dufief Elementary School			
Test Period: 1/28/2025 - 1/31/2025			
Kit Number	QC Type	Room / Area	Result
11926688	D	111	< 0.3
11926663	D	121	< 0.3
11926664	FB	121	< 0.3
11951594	D	130	< 0.3
11951578	D	140C	< 0.3
11951588	FB	140C	< 0.3
11951584	D	147	< 0.3
11951583	D	160	< 0.3
11906872	FB	160	< 0.3
11906899	OB	OFFICE BLANK	< 0.3
11926699	TB	TRAVEL BLANK	< 0.3

Table 3a - Duplicate Worksheet / Data Validation										
Dufief Elementary School										
Test Period: 01/28/2025 - 01/31/2025										
Sample ID			Duplicate Concentrations (pCi/L) and OC Checks							
Kit Numbers		Room / Area	Higher	Lower	Check #1 (Pass/Fail)	2x the Lower	Check #2 (Pass/Fail)	Average	Relative Percent Difference (RPD)	Check #3
11926687	11926688	111	0.3	0.3	✓	0.6	PASS	0.3	<1-pCi/L	✓
11926698	11926663	121	0.3	0.3	✓	0.6	PASS	0.3	<1-pCi/L	✓
11951595	11951594	130	0.3	0.3	✓	0.6	PASS	0.3	<1-pCi/L	✓
11951587	11951578	140C	0.3	0.3	✓	0.6	PASS	0.3	<1-pCi/L	✓
11903973	11951584	147	0.3	0.3	✓	0.6	PASS	0.3	<1-pCi/L	✓
11906879	11951583	160	0.3	0.3	✓	0.6	PASS	0.3	<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:**DUTIES ES  
MAIN**

Kit #	Room Id	Started	Ended	pCi/L	Analyzed
11926680	100A	2025-01-28 @ 10:00 am	2025-01-31 @ 8:00 am	< 0.3	2025-02-04
11906890	100C	2025-01-28 @ 12:00 pm	2025-01-31 @ 8:00 am	< 0.3	2025-02-04
11926683	100E	2025-01-28 @ 10:00 am	2025-01-31 @ 8:00 am	< 0.3	2025-02-04
11926681	102	2025-01-28 @ 10:00 am	2025-01-31 @ 8:00 am	< 0.3	2025-02-04
11926682	102C	2025-01-28 @ 10:00 am	2025-01-31 @ 8:00 am	< 0.3	2025-02-04
11926679	102D	2025-01-28 @ 10:00 am	2025-01-31 @ 8:00 am	< 0.3	2025-02-04
11951580	103	2025-01-28 @ 11:00 am	2025-01-31 @ 8:00 am	< 0.3	2025-02-04
11926684	104	2025-01-28 @ 10:00 am	2025-01-31 @ 8:00 am	< 0.3	2025-02-04
11951579	105	2025-01-28 @ 11:00 am	2025-01-31 @ 9:00 am	< 0.3	2025-02-04
11926686	106	2025-01-28 @ 10:00 am	2025-01-31 @ 8:00 am	< 0.3	2025-02-04
11951553	107	2025-01-28 @ 11:00 am	2025-01-31 @ 9:00 am	< 0.3	2025-02-04
11926685	109	2025-01-28 @ 10:00 am	2025-01-31 @ 9:00 am	< 0.3	2025-02-04
11926697	110	2025-01-28 @ 10:00 am	2025-01-31 @ 8:00 am	< 0.3	2025-02-04
11926687	111	2025-01-28 @ 10:00 am	2025-01-31 @ 8:00 am	< 0.3	2025-02-04
11926688	111	2025-01-28 @ 10:00 am	2025-01-31 @ 8:00 am	< 0.3	2025-02-04
11926694	112	2025-01-28 @ 10:00 am	2025-01-31 @ 8:00 am	< 0.3	2025-02-04
11926690	113	2025-01-28 @ 10:00 am	2025-01-31 @ 8:00 am	< 0.3	2025-02-04
11926696	114	2025-01-28 @ 10:00 am	2025-01-31 @ 8:00 am	< 0.3	2025-02-04
11926695	119	2025-01-28 @ 10:00 am	2025-01-31 @ 9:00 am	< 0.3	2025-02-04
11926656	120	2025-01-28 @ 11:00 am	2025-01-31 @ 8:00 am	< 0.3	2025-02-04
11926663	121	2025-01-28 @ 11:00 am	2025-01-31 @ 8:00 am	< 0.3	2025-02-04
11926664	121	2025-01-28 @ 11:00 am	2025-01-31 @ 8:00 am	< 0.3	2025-02-04
11926698	121	2025-01-28 @ 11:00 am	2025-01-31 @ 8:00 am	< 0.3	2025-02-04
11926693	122	2025-01-28 @ 10:00 am	2025-01-31 @ 8:00 am	< 0.3	2025-02-04
11926692	123	2025-01-28 @ 11:00 am	2025-01-31 @ 8:00 am	< 0.3	2025-02-04
11926672	124	2025-01-28 @ 11:00 am	2025-01-31 @ 8:00 am	< 0.3	2025-02-04
11926647	125	2025-01-28 @ 11:00 am	2025-01-31 @ 8:00 am	< 0.3	2025-02-04
11926655	126	2025-01-28 @ 11:00 am	2025-01-31 @ 8:00 am	< 0.3	2025-02-04
11951595	130	2025-01-28 @ 11:00 am	2025-01-31 @ 9:00 am	< 0.3	2025-02-04
11951594	130	2025-01-28 @ 11:00 am	2025-01-31 @ 9:00 am	< 0.3	2025-02-04
11951596	131	2025-01-28 @ 11:00 am	2025-01-31 @ 8:00 am	< 0.3	2025-02-04
11951592	132	2025-01-28 @ 11:00 am	2025-01-31 @ 8:00 am	< 0.3	2025-02-04
11951591	133	2025-01-28 @ 11:00 am	2025-01-31 @ 9:00 am	< 0.3	2025-02-04
11951589	134	2025-01-28 @ 11:00 am	2025-01-31 @ 8:00 am	< 0.3	2025-02-04
11951590	135	2025-01-28 @ 11:00 am	2025-01-31 @ 8:00 am	< 0.3	2025-02-04
11951593	136	2025-01-28 @ 11:00 am	2025-01-31 @ 9:00 am	< 0.3	2025-02-04
11951581	140A	2025-01-28 @ 11:00 am	2025-01-31 @ 8:00 am	< 0.3	2025-02-04

Radon test result report for:**DUTIES ES  
MAIN**

Kit #	Room Id	Started	Ended	pCi/L	Analyzed
11951588	140C	2025-01-28 @ 11:00 am	2025-01-31 @ 8:00 am	< 0.3	2025-02-04
11951587	140C	2025-01-28 @ 11:00 am	2025-01-31 @ 8:00 am	< 0.3	2025-02-04
11951578	140C	2025-01-28 @ 11:00 am	2025-01-31 @ 8:00 am	< 0.3	2025-02-04
11926689	140D	2025-01-28 @ 10:00 am	2025-01-31 @ 8:00 am	< 0.3	2025-02-04
11903975	143	2025-01-28 @ 11:00 am	2025-01-31 @ 8:00 am	< 0.3	2025-02-04
11926671	144	2025-01-28 @ 11:00 am	2025-01-31 @ 8:00 am	< 0.3	2025-02-04
11926700	145	2025-01-28 @ 11:00 am	2025-01-31 @ 8:00 am	< 0.3	2025-02-04
11926670	146	2025-01-28 @ 11:00 am	2025-01-31 @ 8:00 am	< 0.3	2025-02-04
11951584	147	2025-01-28 @ 11:00 am	2025-01-31 @ 8:00 am	< 0.3	2025-02-04
11903973	147	2025-01-28 @ 11:00 am	2025-01-31 @ 8:00 am	< 0.3	2025-02-04
11951597	148	2025-01-28 @ 11:00 am	2025-01-31 @ 8:00 am	0.6 ± 0.3	2025-02-04
11903970	149	2025-01-28 @ 11:00 am	2025-01-31 @ 8:00 am	< 0.3	2025-02-04
11926677	150	2025-01-28 @ 11:00 am	2025-01-31 @ 8:00 am	< 0.3	2025-02-04
11906881	151	2025-01-28 @ 11:00 am	2025-01-31 @ 8:00 am	< 0.3	2025-02-04
11906888	159	2025-01-28 @ 12:00 pm	2025-01-31 @ 8:00 am	< 0.3	2025-02-04
11906872	160	2025-01-28 @ 12:00 pm	2025-01-31 @ 8:00 am	< 0.3	2025-02-04
11906879	160	2025-01-28 @ 12:00 pm	2025-01-31 @ 8:00 am	< 0.3	2025-02-04
11951583	160	2025-01-28 @ 12:00 pm	2025-01-31 @ 8:00 am	< 0.3	2025-02-04
11906889	161	2025-01-28 @ 12:00 pm	2025-01-31 @ 8:00 am	< 0.3	2025-02-04
11951585	APR	2025-01-28 @ 11:00 am	2025-01-31 @ 8:00 am	< 0.3	2025-02-04
11906887	APR	2025-01-28 @ 11:00 am	2025-01-31 @ 8:00 am	< 0.3	2025-02-04
11951600	GYM	2025-01-28 @ 11:00 am	2025-01-31 @ 8:00 am	< 0.3	2025-02-04
11906882	GYM	2025-01-28 @ 11:00 am	2025-01-31 @ 8:00 am	< 0.3	2025-02-04
11951586	GYM OFFICE	2025-01-28 @ 11:00 am	2025-01-31 @ 8:00 am	< 0.3	2025-02-04
11926678	MAIN OFFICE	2025-01-28 @ 10:00 am	2025-01-31 @ 8:00 am	< 0.3	2025-02-04
11926691	MEDIA CENTER	2025-01-28 @ 11:00 am	2025-01-31 @ 8:00 am	< 0.3	2025-02-04
11951577	MEDIA CENTER	2025-01-28 @ 11:00 am	2025-01-31 @ 8:00 am	< 0.3	2025-02-04
11906880	STAGE	2025-01-28 @ 11:00 am	2025-01-31 @ 8:00 am	< 0.3	2025-02-04

February 4, 2025

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

Radon test result report for:

**OFFICE  
MAIN**

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

February 4, 2025

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

Radon test result report for:

**TRAVEL  
MAIN**

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

# 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



# EXPOSURE IN BOWSER-MORNER RADON CHAMBER

CLIENT KCI TECHNOLOGIES, INC Job Number 20002919

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

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

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

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

11886401 thru 11886406,

11886410

G3 Right

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

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

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

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

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

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

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

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March 19, 2025

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

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Radon test result report for:

**QC**  
**MAIN**

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

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







## Radon Test Kit Chain of Custody

Project Name: MCPS Radon – Testing January 28<sup>th</sup> – January 31<sup>st</sup>, 2024

Name of Schools:

1. Carderock Springs ES
2. Cold Springs ES
3. Concord Center
4. DuFief ES
5. Thomas Edison HS
6. Fallsmead ES
7. Farmland ES

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	Date	Initials
Radon Test Kits Deployed	01/28/2025	
Radon Test Kits Collected	01/31/2025	
Radon Test Kits Shipped to Lab*	01/31/2025	
Radon Test Kits Received by Lab*	02/03/2025	

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



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

Site Name	DuFief Elementary School
Date of Test Report	05/27/2022
Round of Testing	Initial Follow-up Post Remediation 2 Year Testing 5 Year Testing HVAC Upgrade Window Replacement New Addition New Facility
# Rooms Tested	3
# Rooms $\geq$ 4.0 pCi/L	0
Lowest Value	<0.3 pCi/L
Highest Value	<0.3 pCi/L

### **Project Status**

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



May 27, 2022

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

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

Location: DuFief Elementary School  
15001 DuFief Dr.  
Gaithersburg, MD 20878

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 DuFief Elementary School, located at 15001 DuFief Dr. Gaithersburg, MD 20878 (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 28, 2022 and deployed six (6) activated charcoal (AC) radon test kits. KCI deployed radon test kits in all frequently-occupied ground contact rooms, and other areas, (if applicable) in accordance with AARST guidance.

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

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

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

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

KCI returned to the site on March 31, 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 mid 20°Fs and high temperatures ranged from the low 50°Fs to the mid 70°Fs. Maximum sustained winds ranged from 0-33 miles per hour. Average humidity was around 47% with 0.23 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		
DuFief ES RT		
Test Period: 03/28/2022 - 03/31/2022		
Kit Number	Room / Area	Result
11139810	APR	< 0.3
11139812	APR	< 0.3
11139814	BSO	< 0.3
11139806	COUNSELOR	< 0.3
11139813	COUNSELOR	< 0.3
11139817	COUNSELOR	< 0.3

Table 2- Radon Testing Results			
DuFief ES RT			
Test Period: 03/28/2022 - 03/31/2022			
Kit Number	QC Type	Room / Area	Result
11139817	D	Counselor	< 0.3
11139813	FB	Counselor	< 0.3
11139883	OB	OFFICE BLANK	< 0.3
11139841	TB	TRAVEL BLANK	< 0.3



## ATTACHMENT C

### Laboratory Analytical Results

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April 4, 2022

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

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Radon test result report for:

**DUFIEF ES**

**MAIN**

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Kit #	Room Id	Started	Ended	pCi/L	Analyzed
11139810	APR	2022-03-28 @ 10:00 am	2022-03-31 @ 10:00 am	< 0.3	2022-04-04
11139812	APR	2022-03-28 @ 10:00 am	2022-03-31 @ 10:00 am	< 0.3	2022-04-04
11139814	BSO	2022-03-28 @ 10:00 am	2022-03-31 @ 10:00 am	< 0.3	2022-04-04
11139806	COUNSELOR	2022-03-28 @ 10:00 am	2022-03-31 @ 10:00 am	< 0.3	2022-04-04
11139813	COUNSELOR	2022-03-28 @ 10:00 am	2022-03-31 @ 10:00 am	< 0.3	2022-04-04
11139817	COUNSELOR	2022-03-28 @ 10:00 am	2022-03-31 @ 10:00 am	< 0.3	2022-04-04

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# 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).

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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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## Radon Test Kit Chain of Custody

Project Name: MCPS Radon – March 2022 Schools – Retesting

Name of Schools:

1. Rock Terrace School
2. S. Christa McAuliffe ES
3. Cedar Grove ES
4. DuFief ES
5. Emory Grove Center
6. Gaithersburg ES
7. Gaithersburg MS
8. Jones Lane ES
9. Rachel Carson ES
10. Rosemont ES
11. Shady Grove MS
12. Summit Hall ES
13. Albert Einstein HS
14. Eastern MS
15. Montgomery Blair HS
16. Newport Mill MS
17. Strawberry Knoll ES

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	Date	Initials
Radon Test Kits Deployed	03/28/2022	BMM
Radon Test Kits Collected	03/31/2022	BMM
Radon Test Kits Shipped to Lab*	04/01/2022	BMM
Radon Test Kits Received by Lab*	04/04/2022	BMM

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

### MCPS RADON TESTING – EXECUTIVE SUMMARY

Site Name	Dufief Elementary School
Date of Test Report	4/7/2022
Round of Testing	Initial Follow-up Post Remediation 2 Year Testing 5 Year Testing HVAC Upgrade Window Replacement New Addition New Facility
# Rooms Tested	49
# Rooms $\geq$ 4.0 pCi/L	0
Lowest Value	<0.3 pCi/L
Highest Value	0.8 pCi/L

Project Status:

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



April 7, 2022

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

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

Location: Dufief ES  
15001 Dufief Dr.  
Gaithersburg, MD 20878

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 Dufief ES, located at 15001 Dufief Dr. Gaithersburg, MD 20878 (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 February 22, 2022 and deployed fifty one (51) 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 February 25, 2022 to retrieve the radon sampling test kits. KCI shipped all radon tests via overnight delivery to Airchek, Inc. for analysis by gamma-ray spectroscopy. Airchek, Inc.

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

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

These tests represent:

- Follow-up to post-mitigation biennial testing.

These tests were conducted to:

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

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

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

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

KCI also compiled weather data for the testing period and conducted observations of relevant field conditions. During the test period, weather records indicate low temperatures were in the 20s and high temperatures ranged from the high 30s to the high 40s Fahrenheit. Maximum sustained winds ranged from 5-18 miles per hour. Average humidity was around 15% with 1.5 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:

<b>Radon Concentration</b>	<b>Room</b>	<b>Result</b>
<b>≥4.0 pCi/L</b>	None	N/A
<b>&lt;4.0 pCi/L</b>	See Attachment B	

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		
Dufief ES		
Test Period: 02/22/2022 - 02/25/2022		
Kit Number	Room / Area	Result
11123084	1	< 0.3
11123059	2	< 0.3
11123089	3	< 0.3
11123058	4	< 0.3
11123064	5	< 0.3
11123057	6	< 0.3
11123053	7	< 0.3
11123047	8	< 0.3
11123056	9	< 0.3
11123083	10	< 0.3
11123036	11	< 0.3
11123051	11	< 0.3
11123060	12	< 0.3
11123073	12	< 0.3
11123091	13	0.6
11123045	14	< 0.3
11123093	14	< 0.3
11123071	16	< 0.3
11123082	17	0.6
11123061	18	0.8
11123080	18	< 0.3
11123087	20	< 0.3
11123068	21	< 0.3
11123086	AC/RES OFFICE	< 0.3
11123088	ACADEMY	< 0.3
11123085	APR	< 0.3
11123063	ART	< 0.3
11123094	ASST PRINCIPAL	< 0.3
11123065	AUBLEY	< 0.3
11113500	COMM CENTER	< 0.3
11123092	COMM CENTER OFFICE	< 0.3
11123100	CONF ROOM	< 0.3
11123079	GYM	< 0.3
11123081	GYM	< 0.3
11123078	GYM OFFICE	< 0.3
11123074	IMC OFFICE	< 0.3
11123099	IMC OFFICE	< 0.3
11123066	K1	< 0.3
11123095	K1	< 0.3
11123096	K2	< 0.3
11123043	LIBRARIAN OFFICE	< 0.3
11123069	MAIN OFFICE	< 0.3
11123062	NURSE OFFICE	< 0.3
11123072	OT PT	< 0.3
11123098	PRINCIPAL OFFICE	< 0.3

Table 1- Radon Testing Results		
Dufief ES		
Test Period: 02/22/2022 - 02/25/2022		
Kit Number	Room / Area	Result
11122997	SLP	< 0.3
11123044	SPEECH	< 0.3
11123054	SPEECH	< 0.3
11123070	STAFF LOUNGE	< 0.3
11123067	VANE	< 0.3
11123076	WORKROOM	0.6

Table 2- Radon Testing Results			
Dufief ES			
Test Period: 02/22/2022 - 02/25/2022			
Kit Number	QC Type	Room / Area	Result
11123061	D	18	0.8
11123045	D	14	< 0.3
11123099	FB	IMC Office	< 0.3
11123044	D	Speech	< 0.3
11123060	FB	12	< 0.3
11123036	D	11	< 0.3
11123095	D	K1	< 0.3
11139384	OB	OFFICE BLANK	< 0.3
11131222	TB	TRAVEL BLANK	< 0.3



## ATTACHMENT C

### Laboratory Analytical Results

Radon test result report for:**DUFIEF ES  
MAIN**

Kit #	Room Id	Started	Ended	pCi/L	Analyzed
11123084	1	2022-02-22 @ 10:00 am	2022-02-25 @ 9:00 am	< 0.3	2022-03-03
11123083	10	2022-02-22 @ 9:00 am	2022-02-25 @ 9:00 am	< 0.3	2022-03-03
11123051	11	2022-02-22 @ 10:00 am	2022-02-25 @ 9:00 am	< 0.3	2022-03-03
11123036	11	2022-02-22 @ 10:00 am	2022-02-25 @ 9:00 am	< 0.3	2022-03-03
11123073	12	2022-02-22 @ 10:00 am	2022-02-25 @ 9:00 am	< 0.3	2022-03-03
11123060	12	2022-02-22 @ 9:00 am	2022-02-25 @ 9:00 am	< 0.3	2022-03-03
11123091	13	2022-02-22 @ 9:00 am	2022-02-25 @ 9:00 am	0.6 ± 0.5	2022-03-03
11123045	14	2022-02-22 @ 9:00 am	2022-02-25 @ 9:00 am	< 0.3	2022-03-03
11123093	14	2022-02-22 @ 9:00 am	2022-02-25 @ 9:00 am	< 0.3	2022-03-03
11123071	16	2022-02-22 @ 9:00 am	2022-02-25 @ 9:00 am	< 0.3	2022-03-03
11123082	17	2022-02-22 @ 9:00 am	2022-02-25 @ 9:00 am	0.6 ± 0.5	2022-03-03
11123061	18	2022-02-22 @ 9:00 am	2022-02-25 @ 9:00 am	0.8 ± 0.5	2022-03-03
11123080	18	2022-02-22 @ 9:00 am	2022-02-25 @ 9:00 am	< 0.3	2022-03-03
11123059	2	2022-02-22 @ 10:00 am	2022-02-25 @ 9:00 am	< 0.3	2022-03-03
11123087	20	2022-02-22 @ 9:00 am	2022-02-25 @ 9:00 am	< 0.3	2022-03-03
11123068	21	2022-02-22 @ 9:00 am	2022-02-25 @ 9:00 am	< 0.3	2022-03-03
11123089	3	2022-02-22 @ 10:00 am	2022-02-25 @ 9:00 am	< 0.3	2022-03-03
11123058	4	2022-02-22 @ 10:00 am	2022-02-25 @ 9:00 am	< 0.3	2022-03-03
11123064	5	2022-02-22 @ 10:00 am	2022-02-25 @ 9:00 am	< 0.3	2022-03-03
11123057	6	2022-02-22 @ 10:00 am	2022-02-25 @ 9:00 am	< 0.3	2022-03-03
11123053	7	2022-02-22 @ 9:00 am	2022-02-25 @ 9:00 am	< 0.3	2022-03-03
11123047	8	2022-02-22 @ 9:00 am	2022-02-25 @ 9:00 am	< 0.3	2022-03-03
11123056	9	2022-02-22 @ 9:00 am	2022-02-25 @ 9:00 am	< 0.3	2022-03-03
11123086	AC/RES OFFICE	2022-02-22 @ 9:00 am	2022-02-25 @ 9:00 am	< 0.3	2022-03-03
11123088	ACADEMY	2022-02-22 @ 9:00 am	2022-02-25 @ 9:00 am	< 0.3	2022-03-03
11123085	APR	2022-02-22 @ 9:00 am	2022-02-25 @ 9:00 am	< 0.3	2022-03-03
11123063	ART	2022-02-22 @ 10:00 am	2022-02-25 @ 9:00 am	< 0.3	2022-03-03
11123094	ASST PRINCIPAL	2022-02-22 @ 9:00 am	2022-02-25 @ 9:00 am	< 0.3	2022-03-03
11123065	AUBLEY	2022-02-22 @ 10:00 am	2022-02-25 @ 9:00 am	< 0.3	2022-03-03
11113500	COMM CENTER	2022-02-22 @ 9:00 am	2022-02-25 @ 9:00 am	< 0.3	2022-03-03
11123092	COMM CENTER OFFICE	2022-02-22 @ 9:00 am	2022-02-25 @ 9:00 am	< 0.3	2022-03-03
11123100	CONF ROOM	2022-02-22 @ 9:00 am	2022-02-25 @ 9:00 am	< 0.3	2022-03-03
11123079	GYM	2022-02-22 @ 9:00 am	2022-02-25 @ 9:00 am	< 0.3	2022-03-03
11123081	GYM	2022-02-22 @ 9:00 am	2022-02-25 @ 9:00 am	< 0.3	2022-03-03
11123078	GYM OFFICE	2022-02-22 @ 9:00 am	2022-02-25 @ 9:00 am	< 0.3	2022-03-03
11123074	IMC OFFICE	2022-02-22 @ 9:00 am	2022-02-25 @ 9:00 am	< 0.3	2022-03-03
11123099	IMC OFFICE	2022-02-22 @ 9:00 am	2022-02-25 @ 9:00 am	< 0.3	2022-03-03

March 3, 2022

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

Radon test result report for:

**DUFIEF ES  
MAIN**

Kit #	Room Id	Started	Ended	pCi/L	Analyzed
11123095	K1	2022-02-22 @ 10:00 am	2022-02-25 @ 9:00 am	< 0.3	2022-03-03
11123066	K1	2022-02-22 @ 10:00 am	2022-02-25 @ 9:00 am	< 0.3	2022-03-03
11123096	K2	2022-02-22 @ 10:00 am	2022-02-25 @ 9:00 am	< 0.3	2022-03-03
11123043	LIBRARIAN OFFICE	2022-02-22 @ 9:00 am	2022-02-25 @ 9:00 am	< 0.3	2022-03-03
11123069	MAIN OFFICE	2022-02-22 @ 9:00 am	2022-02-25 @ 9:00 am	< 0.3	2022-03-03
11123062	NURSE OFFICE	2022-02-22 @ 9:00 am	2022-02-25 @ 9:00 am	< 0.3	2022-03-03
11123072	OT PT	2022-02-22 @ 9:00 am	2022-02-25 @ 9:00 am	< 0.3	2022-03-03
11123098	PRINCIPAL OFFICE	2022-02-22 @ 9:00 am	2022-02-25 @ 9:00 am	< 0.3	2022-03-03
11122997	SLP	2022-02-22 @ 9:00 am	2022-02-25 @ 9:00 am	< 0.3	2022-03-03
11123044	SPEECH	2022-02-22 @ 9:00 am	2022-02-25 @ 9:00 am	< 0.3	2022-03-03
11123054	SPEECH	2022-02-22 @ 9:00 am	2022-02-25 @ 9:00 am	< 0.3	2022-03-03
11123070	STAFF LOUNGE	2022-02-22 @ 9:00 am	2022-02-25 @ 9:00 am	< 0.3	2022-03-03
11123067	VANE	2022-02-22 @ 10:00 am	2022-02-25 @ 9:00 am	< 0.3	2022-03-03
11123076	WORKROOM	2022-02-22 @ 9:00 am	2022-02-25 @ 9:00 am	0.6 ± 0.4	2022-03-03

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# EXPOSURE IN BOWSER-MORNER RADON CHAMBER

CLIENT KCI Technologies, Inc. Job Number 204186

NOMINAL Conditions: Radon Conc 25.8 pCi/L Rel. Hum 50.1 % Temp. 70.9 F

Date Start: 2/18/22 Date Stop: 2/21/22 Date Start: \_\_\_\_\_ Date Stop: \_\_\_\_\_

Time Start: 0911 Time Stop: 0911 Time Start: \_\_\_\_\_ Time Stop: \_\_\_\_\_

Device No.'s: (3) Char Bags - Device No.'s: \_\_\_\_\_

11113484, 1112998, 20107126 \_\_\_\_\_

23 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 14, 2022

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

Pg 1 of 1

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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 Number	Start Date	Start Time	End Date	End Time	Temp.	Facility	Building	Room	Project ID	Floor	Result
11113484	2022-02-18	9:00 am	2022-02-21	9:00 am	71	OFFICE	MAIN	SK1		1	27.9
11122998	2022-02-18	9:00 am	2022-02-21	9:00 am	71	OFFICE	MAIN	SK2		1	26.0
20107126	2022-02-18	9:00 am	2022-02-21	9:00 am	71	OFFICE	MAIN	SK3		1	27.6

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## Radon Test Kit Chain of Custody

Project Name: MCPS Radon – February 2022 Schools

Name of Schools:

1. Dufief ES
2. Emory Grove Center
3. Fields Road ES
4. Forest Oak MS
5. Gaithersburg ES
6. Gaithersburg MS
7. Jones Lane ES
8. Rachel Carson ES
9. Rosemont ES
10. Shady Grove MS
11. Summit Hall ES
12. Washington Grove ES

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	Date	Initials
Radon Test Kits Deployed	02/22/2022	PM
Radon Test Kits Collected	02/25/2022	PM
Radon Test Kits Shipped to Lab*	02/25/2022	PM
Radon Test Kits Received by Lab*	02/28/2022	PM

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

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

Site Name	DuFief Elementary School
Date of Report	2/28/2020
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	1
# Rooms $\geq 4.0$ pCi/L	0
Lowest Value	<0.3 pCi/L
Highest Value	<0.3 pCi/L

### **Project Status**

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



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2/28/2020

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

Re: Radon Testing Services

KCI Job #12146341.126

**Location: DuFief Elementary School**

15001 DuFief Drive  
Gaithersburg, Maryland 20878

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 DuFief Elementary School, located at 15001 DuFief Drive in Gaithersburg, Maryland 20878 (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 #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 2/3/2020 and deployed five (5) 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 with missing test kits from the December 2019 testing period (i.e. test kit was deployed but not recovered),

- 
2. Rooms with invalidated test kits from the December 2019 testing period (e.g. an open window in the room or disturbed test kit),
  3. Rooms which were locked/inaccessible during the December 2019 testing period,
  4. Rooms with elevated December 2019 results (i.e.  $\geq 3.5$  pCi/L),
  5. Rooms previously tested for radon but not tested in December 2019, and
  6. Additional rooms that require testing (if applicable.)

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 2/6/2020 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 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 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.

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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-30s to the low-50s; and high temperatures ranged from the upper-40s to the mid-60s. Maximum sustained winds ranged from 13-21 miles per hour. Average humidity was approximately 76%. A total of 1.09 Inches of rain were recorded during the testing period. The weather conditions during the testing period may have resulted in atypical radon test results for this facility.

## **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). Follow-up 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>
≥4.0 pCi/L	None	N/A
≤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  
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

### Floor Plan Legend

X-Sample Location (in red)

X- Previous Sample Location

1- Not Samled; No Ground Contact

2- Not Samled; Unoccupied (e.g. Storage, Mechanical)

3- Not Samled; High Humidity/Moisture

4- Not Samled; Bathroom/Hallway



## 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		
DuFief Elementary School		
Test Period: 02/03/20-02/06/20		
Kit Number	Room / Area	Result
9339956	STAGE	< 0.3
9339957	STAGE	< 0.3
9339962	STAGE	< 0.3
9334909	OFFICE BLANK	<0.3
9334910	OFFICE BLANK	<0.3

Table 2- Radon Testing Results			
DuFief Elementary School			
Test Period: 02/03/20-02/06/20			
Kit Number	QC Type	Room / Area	Result
9339956	D	STAGE	<0.3
9339962	FB	STAGE	<0.3
9334902	TRANSIT BLANK	NA	<0.3

# ATTACHMENT C

## Laboratory Analytical Results

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February 11, 2020

**\*\* 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
9339956	STAGE	2020-02-03 @ 1:00 pm	2020-02-06 @ 12:00 pm	< 0.3	2020-02-11
9339957	STAGE	2020-02-03 @ 1:00 pm	2020-02-06 @ 12:00 pm	< 0.3	2020-02-11
9339962	STAGE	2020-02-03 @ 1:00 pm	2020-02-06 @ 12:00 pm	< 0.3	2020-02-11

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# EXPOSURE IN BOWSER-MORNER RADON CHAMBER

CLIENT KCI Technologies, Inc. Job Number 194523

NOMINAL Conditions: Radon Conc 25.8 pCi/L Rel. Hum 49.8 % Temp. 70.2 F

Date Start: 2/21/20 Date Stop: 2/24/20 Date Start: \_\_\_\_\_ Date Stop: \_\_\_\_\_

Time Start: 0745 Time Stop: 0745 Time Start: \_\_\_\_\_ Time Stop: \_\_\_\_\_

Device No.'s: (9) Char Bags - Device No.'s: \_\_\_\_\_

9341725 thru 9341733

52 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

February 28, 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
9341725	N/A	2020-02-21 @ 8:00 am	2020-02-24 @ 8:00 am	26.9 $\pm$ 1.6	2020-02-26
9341730	N/A	2020-02-21 @ 8:00 am	2020-02-24 @ 8:00 am	26.1 $\pm$ 1.6	2020-02-26
9341728	N/A	2020-02-21 @ 8:00 am	2020-02-24 @ 8:00 am	26.9 $\pm$ 1.6	2020-02-26
9341726	N/A	2020-02-21 @ 8:00 am	2020-02-24 @ 8:00 am	25.8 $\pm$ 1.5	2020-02-26
9341731	N/A	2020-02-21 @ 8:00 am	2020-02-24 @ 8:00 am	25.1 $\pm$ 1.5	2020-02-26
9341729	N/A	2020-02-21 @ 8:00 am	2020-02-24 @ 8:00 am	26.2 $\pm$ 1.6	2020-02-26
9341727	N/A	2020-02-21 @ 8:00 am	2020-02-24 @ 8:00 am	27.2 $\pm$ 1.6	2020-02-26
9341732	N/A	2020-02-21 @ 8:00 am	2020-02-24 @ 8:00 am	27.3 $\pm$ 1.6	2020-02-26

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## Radon Test Kit Chain of Custody

Project Name: MCPS Radon 2019 Week 1 Retesting

Name of Schools:

1. Belmont E.S.
2. Clarksburg H.S.
3. Damascus E.S.
4. Damascus H.S.
5. DuFief E.S.
6. Fields Road E.S.
7. Gaithersburg E.S.
8. McAuliffe E.S.
9. Quince Orchard H.S.
10. Snowden Farms E.S.
11. South Lake E.S.
12. Stone Mill E.S.
13. Travilah ES
14. Watkins Mill ES
15. Whitman H.S.

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	Date	Initials
Radon Test Kits Deployed	02/03/20 to 02/04/20	TM
Radon Test Kits Collected	02/06/20 to 02/07/20	TM
Radon Test Kits Shipped to Lab*	02/07/20	TM
Radon Test Kits Received by Lab*	02/10/20	TM

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

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

Site Name	Dufief Elementary School
Date of Report	1/28/2020
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	48
# Rooms $\geq 4.0$ pCi/L	0
Lowest Value	<0.3 pCi/L
Highest Value	0.8 pCi/L

### **Project Status**

Current Project Status at this time: Testing Complete; missing/compromised tests to be sampled; elevated tests to be re-sampled.



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1/28/2020

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: Dufief Elementary School**

15001 DuFief Drive  
Gaithersburg, Maryland 20878

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 Dufief Elementary School, located at 15001 DuFief Drive in Gaithersburg, Maryland 20878 (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/departments/facilities/maintenance/default.aspx?id=458858> or [www.epa.gov/radon](http://www.epa.gov/radon).

KCI visited the site on 12/9/2019 and deployed fifty-nine 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 12/12/2019 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 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 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-30s and high temperatures ranged from the upper-30s to the mid-50s. Maximum sustained winds ranged from 7-21 miles per hour. Average humidity was around 75%. 0.52 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		
Dufief Elementary School		
Test Period: 12/9/2019-12/12/2019		
Kit Number	Room / Area	Result
9334401	16	< 0.3
9334402	10	< 0.3
9334403	20	0.6
9334404	OT/PT	0.7
9334405	18	< 0.3
9334406	15	< 0.3
9334407	ACADEMY	< 0.3
9334408	BOOK ROOM	< 0.3
9334409	6	< 0.3
9334410	10	< 0.3
9334411	11	< 0.3
9334412	SHOP	< 0.3
9334415	17	< 0.3
9334416	OT/PT	< 0.3
9334417	21	0.6
9334418	21 OFFICE	< 0.3
9334419	READING	0.5
9334420	13	< 0.3
9334424	APR	< 0.3
9334425	12	< 0.3
9334426	9	< 0.3
9334427	MUSIC	< 0.3
9334430	14	< 0.3
9334431	12	< 0.3
9334432	GYM	< 0.3
9334433	GYM	< 0.3
9334434	GYM OFFICE	< 0.3
9334435	GYM OFFICE	< 0.3
9334436	BOOK ROOM	< 0.3
9334437	APR	0.7
9334979	OFFICE BLANK	< 0.3
9335767	5	< 0.3
9335768	MEDIA ROOM OFFICE	< 0.3
9335769	MEDIA CENTER	< 0.3
9335770	K2	< 0.3
9335771	1	< 0.3
9335772	COMPUTER LAB	< 0.3
9335773	K1	0.7
9335774	FRONT RESOURCE ROOM	< 0.3
9335775	BUILDING SERVICE OFFICE	< 0.3
9335776	PRINCIPAL	0.6
9335777	PRINCIPAL	0.6
9335778	STAFF LOUNGE	< 0.3
9335779	FRON OFFICE WORK ROOM	< 0.3
9335780	HEALTH	0.5
9335781	FRONT OFFICE	< 0.3
9335782	8	< 0.3
9335783	SLP	< 0.3
9335784	5	0.8
9335786	FRONT OFFICE	< 0.3

9335791	2	< 0.3
9335792	COUNCILORS OFFICE (PAPE)	0.5
9335793	3	0.6
9335794	4	< 0.3
9335795	2	0.6
9335796	7	< 0.3
9335797	SERVER ROOM	0.6
9335798	ART	< 0.3
9335799	STAFF DEVELOPMENT OFFICE	0.7
9335800	FRONT OFFICE CONF ROOM	< 0.3
9334422	STAGE	MISSING

Table 2- Radon Testing Results			
Dufief Elementary School			
Test Period: 12/9/2019-12/12/2019			
Kit Number	QC Type	Room / Area	Result
9335786	D	FRONT OFFICE	<0.3
9335776	D	PRINCIPAL	0.6
9335767	FB	5	<0.3
9335795	D	2	0.6
9334402	FB	10	<0.3
9334425	D	12	<0.3
9334436	D	BOOK ROOM	<0.3
9334416	FB	OT/PT	<0.3
9334435	D	GYM OFFICE	<0.3
9334850	TRANSIT BLANK	NA	< 0.3
9334914	TRANSIT BLANK	NA	< 0.3
9334916	TRANSIT BLANK	NA	< 0.3
9334963	TRANSIT BLANK	NA	< 0.3



# ATTACHMENT C

## Laboratory Analytical Results

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

Kit #	Room Id	Started	Ended	pCi/L	Analyzed
9335771	1	2019-12-09 @ 1:00 pm	2019-12-12 @ 12:00 pm	< 0.3	2019-12-17
9334402	10	2019-12-09 @ 2:00 pm	2019-12-12 @ 12:00 pm	< 0.3	2019-12-17
9334410	10	2019-12-09 @ 2:00 pm	2019-12-12 @ 12:00 pm	< 0.3	2019-12-17
9334411	11	2019-12-09 @ 2:00 pm	2019-12-12 @ 12:00 pm	< 0.3	2019-12-17
9334425	12	2019-12-09 @ 2:00 pm	2019-12-12 @ 12:00 pm	< 0.3	2019-12-17
9334431	12	2019-12-09 @ 2:00 pm	2019-12-12 @ 12:00 pm	< 0.3	2019-12-17
9334420	13	2019-12-09 @ 2:00 pm	2019-12-12 @ 12:00 pm	< 0.3	2019-12-17
9334430	14	2019-12-09 @ 2:00 pm	2019-12-12 @ 12:00 pm	< 0.3	2019-12-17
9334406	15	2019-12-09 @ 2:00 pm	2019-12-12 @ 12:00 pm	< 0.3	2019-12-17
9334401	16	2019-12-09 @ 2:00 pm	2019-12-12 @ 12:00 pm	< 0.3	2019-12-17
9334415	17	2019-12-09 @ 2:00 pm	2019-12-12 @ 12:00 pm	< 0.3	2019-12-17
9334405	18	2019-12-09 @ 2:00 pm	2019-12-12 @ 12:00 pm	< 0.3	2019-12-17
9335795	2	2019-12-09 @ 1:00 pm	2019-12-12 @ 12:00 pm	0.6 ± 0.4	2019-12-17
9335791	2	2019-12-09 @ 1:00 pm	2019-12-12 @ 12:00 pm	< 0.3	2019-12-17
9334403	20	2019-12-09 @ 2:00 pm	2019-12-12 @ 12:00 pm	0.6 ± 0.4	2019-12-17
9334417	21	2019-12-09 @ 2:00 pm	2019-12-12 @ 12:00 pm	0.6 ± 0.4	2019-12-17
9334418	21 OFFICE	2019-12-09 @ 2:00 pm	2019-12-12 @ 12:00 pm	< 0.3	2019-12-17
9335793	3	2019-12-09 @ 1:00 pm	2019-12-12 @ 12:00 pm	0.6 ± 0.3	2019-12-17
9335794	4	2019-12-09 @ 1:00 pm	2019-12-12 @ 12:00 pm	< 0.3	2019-12-17
9335784	5	2019-12-09 @ 1:00 pm	2019-12-12 @ 12:00 pm	0.8 ± 0.4	2019-12-17
9335767	5	2019-12-09 @ 3:00 pm	2019-12-12 @ 12:00 pm	< 0.3	2019-12-17
9334409	6	2019-12-09 @ 2:00 pm	2019-12-12 @ 12:00 pm	< 0.3	2019-12-17
9335796	7	2019-12-09 @ 1:00 pm	2019-12-12 @ 12:00 pm	< 0.3	2019-12-17
9335782	8	2019-12-09 @ 1:00 pm	2019-12-12 @ 12:00 pm	< 0.3	2019-12-17
9334426	9	2019-12-09 @ 2:00 pm	2019-12-12 @ 12:00 pm	< 0.3	2019-12-17
9334407	ACADEMY	2019-12-09 @ 2:00 pm	2019-12-12 @ 12:00 pm	< 0.3	2019-12-17
9334437	APR	2019-12-09 @ 3:00 pm	2019-12-12 @ 12:00 pm	0.7 ± 0.4	2019-12-17
9334424	APR	2019-12-09 @ 3:00 pm	2019-12-12 @ 12:00 pm	< 0.3	2019-12-17
9335798	ART	2019-12-09 @ 1:00 pm	2019-12-12 @ 12:00 pm	< 0.3	2019-12-17
9334436	BOOK ROOM	2019-12-09 @ 2:00 pm	2019-12-12 @ 12:00 pm	< 0.3	2019-12-17
9334408	BOOK ROOM	2019-12-09 @ 2:00 pm	2019-12-12 @ 12:00 pm	< 0.3	2019-12-17
9335775	BUILDING SERVICE OFFICE	2019-12-09 @ 1:00 pm	2019-12-12 @ 12:00 pm	< 0.3	2019-12-17
9335772	COMPUTER LAB	2019-12-09 @ 1:00 pm	2019-12-12 @ 12:00 pm	< 0.3	2019-12-17
9335792	COUNCILORS OFFICE (PAPE)	2019-12-09 @ 1:00 pm	2019-12-12 @ 12:00 pm	0.5 ± 0.4	2019-12-17
9335779	FRON OFFICE WORK ROOM	2019-12-09 @ 1:00 pm	2019-12-12 @ 12:00 pm	< 0.3	2019-12-17
9335786	FRONT OFFICE	2019-12-09 @ 12:00 pm	2019-12-12 @ 12:00 pm	< 0.3	2019-12-17
9335781	FRONT OFFICE	2019-12-09 @ 12:00 pm	2019-12-12 @ 12:00 pm	< 0.3	2019-12-17

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

Kit #	Room Id	Started	Ended	pCi/L	Analyzed
9335800	FRONT OFFICE CONF ROOM	2019-12-09 @ 1:00 pm	2019-12-12 @ 12:00 pm	< 0.3	2019-12-17
9335774	FRONT RESOURCE ROOM	2019-12-09 @ 1:00 pm	2019-12-12 @ 12:00 pm	< 0.3	2019-12-17
9334432	GYM	2019-12-09 @ 2:00 pm	2019-12-12 @ 12:00 pm	< 0.3	2019-12-17
9334433	GYM	2019-12-09 @ 3:00 pm	2019-12-12 @ 12:00 pm	< 0.3	2019-12-17
9334434	GYM OFFICE	2019-12-09 @ 3:00 pm	2019-12-12 @ 12:00 pm	< 0.3	2019-12-17
9334435	GYM OFFICE	2019-12-09 @ 3:00 pm	2019-12-12 @ 12:00 pm	< 0.3	2019-12-17
9335780	HEALTH	2019-12-09 @ 12:00 pm	2019-12-12 @ 12:00 pm	0.5 ± 0.3	2019-12-17
9335773	K1	2019-12-09 @ 1:00 pm	2019-12-12 @ 12:00 pm	0.7 ± 0.4	2019-12-17
9335770	K2	2019-12-09 @ 1:00 pm	2019-12-12 @ 12:00 pm	< 0.3	2019-12-17
9335769	MEDIA CENTER	2019-12-09 @ 1:00 pm	2019-12-12 @ 12:00 pm	< 0.3	2019-12-17
9335768	MEDIA ROOM OFFICE	2019-12-09 @ 1:00 pm	2019-12-12 @ 12:00 pm	< 0.3	2019-12-17
9334427	MUSIC	2019-12-09 @ 3:00 pm	2019-12-12 @ 12:00 pm	< 0.3	2019-12-17
9334404	OT/PT	2019-12-09 @ 2:00 pm	2019-12-12 @ 12:00 pm	0.7 ± 0.4	2019-12-17
9334416	OT/PT	2019-12-09 @ 2:00 pm	2019-12-12 @ 12:00 pm	< 0.3	2019-12-17
9335776	PRINCIPAL	2019-12-09 @ 1:00 pm	2019-12-12 @ 12:00 pm	0.6 ± 0.4	2019-12-17
9335777	PRINCIPAL	2019-12-09 @ 1:00 pm	2019-12-12 @ 12:00 pm	0.6 ± 0.3	2019-12-17
9334419	READING	2019-12-09 @ 2:00 pm	2019-12-12 @ 12:00 pm	0.5 ± 0.3	2019-12-17
9335797	SERVER ROOM	2019-12-09 @ 1:00 pm	2019-12-12 @ 12:00 pm	0.6 ± 0.4	2019-12-17
9334412	SHOP	2019-12-09 @ 2:00 pm	2019-12-12 @ 12:00 pm	< 0.3	2019-12-17
9335783	SLP	2019-12-09 @ 1:00 pm	2019-12-12 @ 12:00 pm	< 0.3	2019-12-17
9335799	STAFF DEVELOPMENT OFFICE	2019-12-09 @ 1:00 pm	2019-12-12 @ 12:00 pm	0.7 ± 0.4	2019-12-17
9335778	STAFF LOUNGE	2019-12-09 @ 1:00 pm	2019-12-12 @ 12:00 pm	< 0.3	2019-12-17

# EXPOSURE IN BOWSER-MORNER RADON CHAMBER

CLIENT KCI Technologies Inc. Job Number 193475

NOMINAL Conditions: Radon Conc 25.7 pCi/L Rel. Hum 74.6 % Temp. 69.9 F

Date Start: 12/13/19 Date Stop: 12/16/19 Date Start: \_\_\_\_\_ Date Stop: \_\_\_\_\_  
 Time Start: 0806 Time Stop: 0806 Time Start: \_\_\_\_\_ Time Stop: \_\_\_\_\_  
 (Group 1)  
 Device No.'s: (20) Char. Bags - Device No.'s: \_\_\_\_\_  
9334502 thru 9334519,  
9334514, 9334516, 9334517,  
9334519, 9334519  
9334522 thru 9334528  
B4

Date Start: 12/13/19 Date Stop: 12/16/19 Date Start: \_\_\_\_\_ Date Stop: \_\_\_\_\_  
0811  
 Time Start: 0806 acm Time Stop: 0811 Time Start: \_\_\_\_\_ Time Stop: \_\_\_\_\_  
 (Group 2)  
 Device No.'s: (20) Char. Bags - Device No.'s: \_\_\_\_\_  
9334529 thru 9334538,  
9334540,  
9334542 thru 9334550  
B3

Date Start: 12/13/19 Date Stop: 12/16/19 Date Start: \_\_\_\_\_ Date Stop: \_\_\_\_\_  
 Time Start: 0816 Time Stop: 0816 Time Start: \_\_\_\_\_ Time Stop: \_\_\_\_\_  
 (Group 3)  
 Device No.'s: (20) Char. Bags - Device No.'s: \_\_\_\_\_  
9334551, 9334552, 9334562,  
9334555 thru 9334559,  
9334569, 9334576, 9334579,  
9334580, 9334583, 9334584,  
9334591, 9334593, 9334594,  
9334597, 9334598, 9334599  
B2

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:

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
9334583	N/A	2019-12-13 @ 8:00 am	2019-12-16 @ 8:00 am	23.3 $\pm$ 1.4	2019-12-18
9334529	N/A	2019-12-13 @ 8:00 am	2019-12-16 @ 8:00 am	24.3 $\pm$ 1.5	2019-12-18
9334597	N/A	2019-12-13 @ 8:00 am	2019-12-16 @ 8:00 am	23.8 $\pm$ 1.4	2019-12-18
9334534	N/A	2019-12-13 @ 8:00 am	2019-12-16 @ 8:00 am	23.3 $\pm$ 1.4	2019-12-18
9334540	N/A	2019-12-13 @ 8:00 am	2019-12-16 @ 8:00 am	23.9 $\pm$ 1.4	2019-12-18
9334546	N/A	2019-12-13 @ 8:00 am	2019-12-16 @ 8:00 am	24.9 $\pm$ 1.5	2019-12-18
9334551	N/A	2019-12-13 @ 8:00 am	2019-12-16 @ 8:00 am	23.3 $\pm$ 1.4	2019-12-18
9334558	N/A	2019-12-13 @ 8:00 am	2019-12-16 @ 8:00 am	23.6 $\pm$ 1.4	2019-12-18
9334579	N/A	2019-12-13 @ 8:00 am	2019-12-16 @ 8:00 am	23.6 $\pm$ 1.4	2019-12-18
9334593	N/A	2019-12-13 @ 8:00 am	2019-12-16 @ 8:00 am	23.3 $\pm$ 1.4	2019-12-18
9334532	N/A	2019-12-13 @ 8:00 am	2019-12-16 @ 8:00 am	23.6 $\pm$ 1.4	2019-12-18
9334537	N/A	2019-12-13 @ 8:00 am	2019-12-16 @ 8:00 am	23.8 $\pm$ 1.4	2019-12-18
9334544	N/A	2019-12-13 @ 8:00 am	2019-12-16 @ 8:00 am	23.5 $\pm$ 1.4	2019-12-18
9334549	N/A	2019-12-13 @ 8:00 am	2019-12-16 @ 8:00 am	24.4 $\pm$ 1.5	2019-12-18
9334556	N/A	2019-12-13 @ 8:00 am	2019-12-16 @ 8:00 am	24.1 $\pm$ 1.4	2019-12-18
9334569	N/A	2019-12-13 @ 8:00 am	2019-12-16 @ 8:00 am	23.7 $\pm$ 1.4	2019-12-18
9334584	N/A	2019-12-13 @ 8:00 am	2019-12-16 @ 8:00 am	24.4 $\pm$ 1.5	2019-12-18
9334530	N/A	2019-12-13 @ 8:00 am	2019-12-16 @ 8:00 am	23.6 $\pm$ 1.4	2019-12-18
9334598	N/A	2019-12-13 @ 8:00 am	2019-12-16 @ 8:00 am	23.7 $\pm$ 1.4	2019-12-18
9334535	N/A	2019-12-13 @ 8:00 am	2019-12-16 @ 8:00 am	23.0 $\pm$ 1.4	2019-12-18
9334542	N/A	2019-12-13 @ 8:00 am	2019-12-16 @ 8:00 am	23.7 $\pm$ 1.4	2019-12-18
9334547	N/A	2019-12-13 @ 8:00 am	2019-12-16 @ 8:00 am	25.2 $\pm$ 1.5	2019-12-18
9334552	N/A	2019-12-13 @ 8:00 am	2019-12-16 @ 8:00 am	24.2 $\pm$ 1.4	2019-12-18
9334559	N/A	2019-12-13 @ 8:00 am	2019-12-16 @ 8:00 am	24.1 $\pm$ 1.4	2019-12-18
9334580	N/A	2019-12-13 @ 8:00 am	2019-12-16 @ 8:00 am	24.1 $\pm$ 1.4	2019-12-18
9334594	N/A	2019-12-13 @ 8:00 am	2019-12-16 @ 8:00 am	24.1 $\pm$ 1.4	2019-12-18
9334533	N/A	2019-12-13 @ 8:00 am	2019-12-16 @ 8:00 am	24.3 $\pm$ 1.5	2019-12-18
9334538	N/A	2019-12-13 @ 8:00 am	2019-12-16 @ 8:00 am	24.6 $\pm$ 1.5	2019-12-18
9334545	N/A	2019-12-13 @ 8:00 am	2019-12-16 @ 8:00 am	24.0 $\pm$ 1.4	2019-12-18
9334550	N/A	2019-12-13 @ 8:00 am	2019-12-16 @ 8:00 am	24.1 $\pm$ 1.4	2019-12-18
9334557	N/A	2019-12-13 @ 8:00 am	2019-12-16 @ 8:00 am	24.6 $\pm$ 1.5	2019-12-18
9334576	N/A	2019-12-13 @ 8:00 am	2019-12-16 @ 8:00 am	23.3 $\pm$ 1.4	2019-12-18
9334591	N/A	2019-12-13 @ 8:00 am	2019-12-16 @ 8:00 am	23.7 $\pm$ 1.4	2019-12-18
9334531	N/A	2019-12-13 @ 8:00 am	2019-12-16 @ 8:00 am	24.3 $\pm$ 1.5	2019-12-18
9334599	N/A	2019-12-13 @ 8:00 am	2019-12-16 @ 8:00 am	23.8 $\pm$ 1.4	2019-12-18
9334536	N/A	2019-12-13 @ 8:00 am	2019-12-16 @ 8:00 am	24.4 $\pm$ 1.5	2019-12-18
9334543	N/A	2019-12-13 @ 8:00 am	2019-12-16 @ 8:00 am	24.4 $\pm$ 1.5	2019-12-18

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December 18, 2019

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

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Radon test result report for:

**N/A**

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<b>Kit #</b>	<b>Room Id</b>	<b>Started</b>	<b>Ended</b>	<b>pCi/L</b>	<b>Analyzed</b>
9334548	N/A	2019-12-13 @ 8:00 am	2019-12-16 @ 8:00 am	24.0 ± 1.4	2019-12-18
9334555	N/A	2019-12-13 @ 8:00 am	2019-12-16 @ 8:00 am	23.4 ± 1.4	2019-12-18
9334562	N/A	2019-12-13 @ 8:00 am	2019-12-16 @ 8:00 am	23.5 ± 1.4	2019-12-18

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

December 18, 2019

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

Radon test result report for:

**S**

**N/A**

Kit #	Room Id	Started	Ended	pCi/L	Analyzed
9334505	N/A	2019-12-13 @ 8:00 am	2019-12-16 @ 8:00 am	24.5 ± 1.5	2019-12-18
9334510	N/A	2019-12-13 @ 8:00 am	2019-12-16 @ 8:00 am	24.4 ± 1.5	2019-12-18
9334522	N/A	2019-12-13 @ 8:00 am	2019-12-16 @ 8:00 am	23.9 ± 1.4	2019-12-18
9334527	N/A	2019-12-13 @ 8:00 am	2019-12-16 @ 8:00 am	22.6 ± 1.4	2019-12-18
9334503	N/A	2019-12-13 @ 8:00 am	2019-12-16 @ 8:00 am	23.6 ± 1.4	2019-12-18
9334508	N/A	2019-12-13 @ 8:00 am	2019-12-16 @ 8:00 am	24.7 ± 1.5	2019-12-18
9334517	N/A	2019-12-13 @ 8:00 am	2019-12-16 @ 8:00 am	23.5 ± 1.4	2019-12-18
9334525	N/A	2019-12-13 @ 8:00 am	2019-12-16 @ 8:00 am	23.8 ± 1.4	2019-12-18
9334506	N/A	2019-12-13 @ 8:00 am	2019-12-16 @ 8:00 am	24.3 ± 1.5	2019-12-18
9334514	N/A	2019-12-13 @ 8:00 am	2019-12-16 @ 8:00 am	24.5 ± 1.5	2019-12-18
9334523	N/A	2019-12-13 @ 8:00 am	2019-12-16 @ 8:00 am	23.6 ± 1.4	2019-12-18
9334528	N/A	2019-12-13 @ 8:00 am	2019-12-16 @ 8:00 am	23.8 ± 1.4	2019-12-18
9334504	N/A	2019-12-13 @ 8:00 am	2019-12-16 @ 8:00 am	23.8 ± 1.4	2019-12-18
9334509	N/A	2019-12-13 @ 8:00 am	2019-12-16 @ 8:00 am	23.5 ± 1.4	2019-12-18
9334519	N/A	2019-12-13 @ 8:00 am	2019-12-16 @ 8:00 am	24.1 ± 1.4	2019-12-18
9334526	N/A	2019-12-13 @ 8:00 am	2019-12-16 @ 8:00 am	23.3 ± 1.4	2019-12-18
9334502	N/A	2019-12-13 @ 8:00 am	2019-12-16 @ 8:00 am	23.7 ± 1.4	2019-12-18
9334507	N/A	2019-12-13 @ 8:00 am	2019-12-16 @ 8:00 am	24.7 ± 1.5	2019-12-18
9334516	N/A	2019-12-13 @ 8:00 am	2019-12-16 @ 8:00 am	22.2 ± 1.3	2019-12-18
9334524	N/A	2019-12-13 @ 8:00 am	2019-12-16 @ 8:00 am	24.6 ± 1.5	2019-12-18



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

## Radon Test Kit Chain of Custody

Project Name: MCPS Radon 2019 Week 1

Name of Schools:

- |                             |                         |
|-----------------------------|-------------------------|
| 1. Baker M.S.               | 13. Jones Lane E.S.     |
| 2. Belmont E.S.             | 14. Lake Seneca E.S.    |
| 3. Clarksburg E.S.          | 15. McAuliffe E.S.      |
| 4. Clarksburg H.S.          | 16. Quince Orchard H.S. |
| 5. Clearspring E.S.         | 17. Rosa Parks M.S.     |
| 6. Damascus E.S.            | 18. Snowden Farm E.S.   |
| 7. Damascus H.S.            | 19. South Lake E.S.     |
| 8. Dufief E.S.              | 20. Stone Mill E.S.     |
| 9. Fields Road E.S.         | 21. Travilah E.S.       |
| 10. Gaithersburg E.S.       | 22. Watkins Mill E.S.   |
| 11. Germantown E.S.         | 23. Watkins Mill H.S.   |
| 12. Great Seneca Creek E.S. | 24. Whitman H.S.        |

---

	Date	Initials
Radon Test Kits Deployed	12/09/19 to 12/10/19	JM
Radon Test Kits Collected	12/12/19 to 12/13/19	JM
Radon Test Kits Shipped to Lab*	12/13/19	JM
Radon Test Kits Received by Lab*	12/16/19	JM

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

**MCPS RADON TESTING - EXECUTIVE SUMMARY**

Site Name	Dufief Elementary School
Date of Report	March 9, 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	5
# Rooms $\geq 4.0$ pCi/L	0
Lowest Value	< 0.3 pCi/L
Highest Value	0.7 pCi/L

**Project Status**

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



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March 9, 2018

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

Re: Radon Testing Services

KCI Job #1214634188

**Location: Dufief Elementary School**

15001 DuFief Dr.,  
Gaithersburg, Maryland 20878

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 Dufief Elementary School, located at 15001 DuFief Dr., in Gaithersburg, Maryland 20878 (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 12, 2018 and deployed seven (7) 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 15, 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 10-15 miles per hour. Average humidity was around 69%. 0.05 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		
Dufief Elementary School		
Test Period: 02/12/18-02/15/18		
Kit Number	Room / Area	Result
7978816	20	< 0.3
7194157	COMPUTER 2	< 0.3
7978866	KITCHEN	< 0.3
7978892	STAGE	0.7
7978893	TESTING	0.7

Table Note:

\* Missing or Compromised Sample

Table 2- Radon Testing Results		
Dufief Elementary School		
Test Period: 02/12/18-02/15/18		
Kit Number	QC Type	Result
7194160	D (COMPUTER 2)	0.6
7194159	FB (COMPUTER 2)	< 0.3

Table Note:

\* Missing or Compromised Sample

# ATTACHMENT C

## Laboratory Analytical Results

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February 27, 2018

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

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Radon test result report for:

**DUFIEF ELEMENTARY SCHOOL  
MAIN**

---

<b>Kit #</b>	<b>Room Id</b>	<b>Started</b>	<b>Ended</b>	<b>pCi/L</b>	<b>Analyzed</b>
7978816	20	2018-02-12 @ 2:00 pm	2018-02-15 @ 11:00 am	< 0.3	2018-02-19
7194157	COMPUTER 2	2018-02-12 @ 2:00 pm	2018-02-15 @ 11:00 am	< 0.3	2018-02-19
7194159	COMPUTER 2	2018-02-12 @ 2:00 pm	2018-02-15 @ 11:00 am	< 0.3	2018-02-19
7194160	COMPUTER 2	2018-02-12 @ 2:00 pm	2018-02-15 @ 11:00 am	0.6 ± 0.3	2018-02-19
7978866	KITCHEN	2018-02-12 @ 2:00 pm	2018-02-15 @ 11:00 am	< 0.3	2018-02-19
7978892	STAGE	2018-02-12 @ 2:00 pm	2018-02-15 @ 11:00 am	0.7 ± 0.3	2018-02-19
7978893	TESTING	2018-02-12 @ 2:00 pm	2018-02-15 @ 11:00 am	0.7 ± 0.3	2018-02-19

---

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

Names of Schools:

- |  |                                      |
|--|--------------------------------------|
| 1. Highland Elementary School          | 20. Bethesda Trans. and Maint. Depot |
| 2. Stephen Knolls Elementary School    | 21. Sequoyah Elementary School       |
| 3. Silver Creek Middle School          | 22. Gaithersburg Middle School       |
| 4. Woodlin Elementary School           | 23. Wayside Elementary School        |
| 5. Sligo Creek Elementary School       | 24. Travilah Elementary School       |
| 6. Francis Scott Key Middle School     | 25. Damascus High School             |
| 7. John T. Baker Middle School         | 26. Jones Lane Elementary School     |
| 8. Cedar Grove Elementary School       | 27. Greencastle Elementary School    |
| 9. Clarksburg Elementary School        | 28. Spring Brook High School         |
| 10. Clarksburg Elementary School Annex | 29. Montgomery Blair High School     |
| 11. Fields Road Elementary School      | 30. Watkins Mill High School         |
| 12. Dufief Elementary School           |                                      |
| 13. Brown Station Elementary School    |                                      |
| 14. Diamond Elementary School          |                                      |
| 15. Fallsmeade Elementary School       |                                      |
| 16. Thomas Whootton High School        |                                      |
| 17. Lake Seneca Elementary School      |                                      |
| 18. Redland Middle School              |                                      |
| 19. Newport Mill Middle School         |                                      |

---

	Date	Initials
Radon Test Kits Deployed	2/12/18	JM
Radon Test Kits Collected	2/15/18	JM
Radon Test Kits Shipped to Lab*	2/15/18	JM
Radon Test Kits Received by Lab*	2/19/15	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

---

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: <u>2/16/18</u> Date Stop: <u>2/19/18</u>	Date Start: _____ Date Stop: _____
Time Start: <u>1052</u> Time Stop: <u>1052</u>	Time Start: _____ Time Stop: _____
Device No.'s: <u>(6) Char. Bags-</u>	Device No.'s: _____
<u>7984181, 7986621, 7985683</u>	_____
<u>7984168, 7986618, 7984169</u>	_____
<u>G3 Middle</u>	_____
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	Dufief Elementary School
Date of Report	February 1, 2018
Round of Testing	Initial Follow-up Post Remediation <b>2 year testing</b> 5 year testing HVAC Upgrade Window Replacement New Addition New Facility
# of Rooms Tested	49
# Rooms $\geq 4.0$ pCi/L	0
Lowest Value	< 0.3 pCi/L
Highest Value	2.3 pCi/L

Current Project Status at this time: Results satisfactory to date; missed locations to be sampled.



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February 1, 2018

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

Re: Radon Testing Services

KCI Job #1214694182

**Location: Dufief Elementary School**

15001 DuFief Dr.,  
Gaithersburg, Maryland 20878

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 Dufief Elementary School, located at 15001 DuFief Dr., in Gaithersburg, Maryland 20878 (subject site).

**SCOPE OF SERVICES**

KCI conducted radon testing at the subject site to evaluate indoor radon levels relative to the USEPA's recommended action level of 4.0 picocuries per Liter (pCi/L) - the level at which EPA recommends that schools take action to reduce the level. KCI conducted the radon testing in accordance with American Association of Radon Scientists and Technologists (AARST) *Protocol for Conducting Measurements of Radon and Radon Decay Products in Schools and Large Buildings*. A National Radon Safety Board (NRSB) Radon Measurement Specialist (certification #14SS056) supervised the testing. Additional information on radon management and the health effects of radon exposure is available from [www.montgomerycountymd.gov/dep/air/radon](http://www.montgomerycountymd.gov/dep/air/radon) or [www.epa.gov/radon](http://www.epa.gov/radon).

KCI visited the site on December 4, 2017 and deployed fifty-seven (57) activated charcoal (AC) radon test kits. KCI deployed radon test kits in frequently-occupied ground contact rooms, and other areas, (if applicable) in accordance with AARST guidance. A floor plan map of the building with the test locations is included as Appendix A of this report.

As a quality control measure, KCI included duplicate samples, field blanks, lab transit blanks, and office blanks in accordance with AARST recommendations. In addition, KCI submitted six (6) test kits to

Bowser-Morner, Inc. as spike samples. The spiked tests were exposed to a known radon concentration by Bowser-Morner, Inc. prior to being returned to the laboratory for analysis.

KCI returned to the site on December 7, 2017 to retrieve the radon sampling test kits. KCI shipped all radon tests via overnight delivery to Aircheck, Inc. for analysis by gamma-ray spectroscopy. Aircheck, Inc. is a NRSB certified analytical laboratory for radon analysis (certification # ARL1402) located at 1936 Butler Bridge Road, Mills River, North Carolina.

### **EVALUATION OF TESTING CONDITIONS**

These tests represent:

- Post-mitigation biennial testing.

These tests were conducted to:

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

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

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

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

KCI also compiled weather data for the testing period and conducted observations of relevant field conditions. During the test period, weather records indicate low temperatures were in the high-20s to mid-40s and high temperatures ranged from the low-40s to mid-50s. Maximum sustained winds ranged from 12-17 miles per hour. Average humidity was around 65%. 0.16 Inches of precipitation was recorded during the testing period.

### **RESULTS**

The sampling locations, field observations, and analytical results are listed on Table 1 (Attachment B). The quality control sample locations and analytical results are listed on Table 2 (Attachment B). Missing/compromised tests, missed rooms, and locked rooms are listed on Table 3 (Attachment B). The laboratory

analytical results are included in Attachment C. Laboratory results and exposure data for the spike samples are also included in Attachment C.

The results of the radon test analysis indicated the following:

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

Quality Control Samples	
Results of Blank Canisters:	The field blank, 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 Mouldale, 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		
Dufief Elementary School		
Test Period: 12/04/17-12/07/17		
Kit Number	Room / Area	Result
7978788	1	0.7
7978787	2	< 0.3
7978748	3	< 0.3
7978795	4	< 0.3
7978794	5	< 0.3
7978796	6	< 0.3
7978763	7	0.5
7978773	8	< 0.3
7978753	9	< 0.3
7978754	10	< 0.3
7978755	11	0.7
7978756	12	< 0.3
7978781	13	< 0.3
7978749	14	< 0.3
7978744	15	0.6
7978790	16	0.6
7978789	17	0.8
7978776	18	< 0.3
7978783	19	< 0.3
7978752	21	0.6
7978791	22	< 0.3
7978784	23	< 0.3
7978792	24	< 0.3
7978751	25	0.6
7978769	APR	< 0.3
7978770	APR	< 0.3
7978743	ART	0.5
7978712	BSO	0.5
7978786	COMP	0.5
7978774	CONF	< 0.3
7978775	COUNS	0.6
7978772	DEV READING	< 0.3
7978726	GYM	< 0.3
7978733	GYM	< 0.3
7978798	HEALTH	< 0.3
7978725	IDA	< 0.3
7978800	IMC	0.7
7978780	IMC	0.6
7978779	K1	< 0.3
7978778	K2	< 0.3
7978797	MAIN OFFICE	0.7
7978717	MUSIC	0.6
7979098	OFFICE BLANK	2.3
7978718	PE	0.6
7978762	PRN	0.6
7978782	RSC	0.8

Table Note:

\* Missing or Compromised Sample

Radon Testing Results		
Dufief Elementary School		
Test Period: 12/04/17-12/07/17		
Kit Number	Room / Area	Result
7978771	S&H	< 0.3
7978757	STAFF	< 0.3
7978793	WORK AREA	< 0.3
7978758	WORK RM	0.8
7978785	WR	< 0.3
7978777	WR2	0.7

Table Note:

\* Missing or Compromised Sample

Radon Testing Results		
Dufief Elementary School		
Test Period: 12/04/17-12/07/17		
Kit Number	QC Type	Result
7978764	D (COUNS)	0.7
7978799	D (HEALTH)	0.6
7978761	D (PRN)	0.5
7978750	FB (CONF)	< 0.3
7979099	OB (OFFICE BLANK)	< 0.3

Table Note:

\* Missing or Compromised Sample



## ATTACHMENT C

### Laboratory Analytical Results

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

<b>Kit #</b>	<b>Room Id</b>	<b>Started</b>	<b>Ended</b>	<b>pCi/L</b>	<b>Analyzed</b>
7978788	1	2017-12-04 @ 9:00 am	2017-12-07 @ 8:00 am	0.7 ± 0.3	2017-12-12
7978754	10	2017-12-04 @ 9:00 am	2017-12-07 @ 8:00 am	< 0.3	2017-12-12
7978755	11	2017-12-04 @ 9:00 am	2017-12-07 @ 8:00 am	0.7 ± 0.3	2017-12-11
7978756	12	2017-12-04 @ 9:00 am	2017-12-07 @ 8:00 am	< 0.3	2017-12-11
7978781	13	2017-12-04 @ 9:00 am	2017-12-07 @ 8:00 am	< 0.3	2017-12-11
7978749	14	2017-12-04 @ 9:00 am	2017-12-07 @ 8:00 am	< 0.3	2017-12-12
7978744	15	2017-12-04 @ 9:00 am	2017-12-07 @ 8:00 am	0.6 ± 0.3	2017-12-11
7978790	16	2017-12-04 @ 9:00 am	2017-12-07 @ 8:00 am	0.6 ± 0.3	2017-12-12
7978789	17	2017-12-04 @ 9:00 am	2017-12-07 @ 8:00 am	0.8 ± 0.3	2017-12-12
7978776	18	2017-12-04 @ 9:00 am	2017-12-07 @ 8:00 am	< 0.3	2017-12-11
7978783	19	2017-12-04 @ 9:00 am	2017-12-07 @ 8:00 am	< 0.3	2017-12-12
7978787	2	2017-12-04 @ 9:00 am	2017-12-07 @ 9:00 am	< 0.3	2017-12-12
7978752	21	2017-12-04 @ 9:00 am	2017-12-07 @ 8:00 am	0.6 ± 0.3	2017-12-12
7978791	22	2017-12-04 @ 9:00 am	2017-12-07 @ 8:00 am	< 0.3	2017-12-12
7978784	23	2017-12-04 @ 9:00 am	2017-12-07 @ 8:00 am	< 0.3	2017-12-11
7978792	24	2017-12-04 @ 9:00 am	2017-12-07 @ 8:00 am	< 0.3	2017-12-11
7978751	25	2017-12-04 @ 9:00 am	2017-12-07 @ 8:00 am	0.6 ± 0.3	2017-12-11
7978748	3	2017-12-04 @ 9:00 am	2017-12-07 @ 9:00 am	< 0.3	2017-12-11
7978795	4	2017-12-04 @ 9:00 am	2017-12-07 @ 9:00 am	< 0.3	2017-12-11
7978794	5	2017-12-04 @ 9:00 am	2017-12-07 @ 8:00 am	< 0.3	2017-12-11
7978796	6	2017-12-04 @ 9:00 am	2017-12-07 @ 9:00 am	< 0.3	2017-12-11
7978763	7	2017-12-04 @ 9:00 am	2017-12-07 @ 8:00 am	0.5 ± 0.3	2017-12-11
7978773	8	2017-12-04 @ 9:00 am	2017-12-07 @ 8:00 am	< 0.3	2017-12-11
7978753	9	2017-12-04 @ 9:00 am	2017-12-07 @ 8:00 am	< 0.3	2017-12-12
7978770	APR	2017-12-04 @ 10:00 am	2017-12-07 @ 8:00 am	< 0.3	2017-12-11
7978769	APR	2017-12-04 @ 10:00 am	2017-12-07 @ 8:00 am	< 0.3	2017-12-11
7978743	ART	2017-12-04 @ 8:00 am	2017-12-07 @ 9:00 am	0.5 ± 0.3	2017-12-12
7978712	BSO	2017-12-04 @ 10:00 am	2017-12-07 @ 9:00 am	0.5 ± 0.3	2017-12-11
7978786	COMP	2017-12-04 @ 8:00 am	2017-12-07 @ 8:00 am	0.5 ± 0.3	2017-12-11
7978750	CONF	2017-12-04 @ 10:00 am	2017-12-07 @ 8:00 am	< 0.3	2017-12-11
7978774	CONF	2017-12-04 @ 10:00 am	2017-12-07 @ 8:00 am	< 0.3	2017-12-11
7978775	COUNS	2017-12-04 @ 10:00 am	2017-12-07 @ 8:00 am	0.6 ± 0.3	2017-12-11
7978764	COUNS	2017-12-04 @ 10:00 am	2017-12-07 @ 8:00 am	0.7 ± 0.3	2017-12-12
7978772	DEV READING	2017-12-04 @ 10:00 am	2017-12-07 @ 9:00 am	< 0.3	2017-12-11
7978726	GYM	2017-12-04 @ 10:00 am	2017-12-07 @ 9:00 am	< 0.3	2017-12-11
7978733	GYM	2017-12-04 @ 10:00 am	2017-12-07 @ 9:00 am	< 0.3	2017-12-11
7978798	HEALTH	2017-12-04 @ 8:00 am	2017-12-07 @ 8:00 am	< 0.3	2017-12-11

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

<b>Kit #</b>	<b>Room Id</b>	<b>Started</b>	<b>Ended</b>	<b>pCi/L</b>	<b>Analyzed</b>
7978799	HEALTH	2017-12-04 @ 8:00 am	2017-12-07 @ 8:00 am	0.6 ± 0.3	2017-12-11
7978725	IDA	2017-12-04 @ 10:00 am	2017-12-07 @ 9:00 am	< 0.3	2017-12-11
7978800	IMC	2017-12-04 @ 8:00 am	2017-12-07 @ 8:00 am	0.7 ± 0.3	2017-12-11
7978780	IMC	2017-12-04 @ 8:00 am	2017-12-07 @ 8:00 am	0.6 ± 0.3	2017-12-11
7978779	K1	2017-12-04 @ 8:00 am	2017-12-07 @ 8:00 am	< 0.3	2017-12-11
7978778	K2	2017-12-04 @ 8:00 am	2017-12-07 @ 8:00 am	< 0.3	2017-12-11
7978797	MAIN OFFICE	2017-12-04 @ 8:00 am	2017-12-07 @ 8:00 am	0.7 ± 0.3	2017-12-11
7978717	MUSIC	2017-12-04 @ 10:00 am	2017-12-07 @ 8:00 am	0.6 ± 0.3	2017-12-12
7979099	OFFICE BLANK	2017-12-04 @ 1:00 pm	2017-12-07 @ 1:00 pm	< 0.3	2017-12-11
7979098	OFFICE BLANK	2017-12-04 @ 1:00 pm	2017-12-07 @ 1:00 pm	2.3 ± 0.4	2017-12-11
7978718	PE	2017-12-04 @ 10:00 am	2017-12-07 @ 9:00 am	0.6 ± 0.3	2017-12-12
7978761	PRN	2017-12-04 @ 10:00 am	2017-12-07 @ 8:00 am	0.5 ± 0.3	2017-12-11
7978762	PRN	2017-12-04 @ 10:00 am	2017-12-07 @ 8:00 am	0.6 ± 0.3	2017-12-11
7978782	RSC	2017-12-04 @ 9:00 am	2017-12-07 @ 9:00 am	0.8 ± 0.3	2017-12-11
7978771	S&H	2017-12-04 @ 10:00 am	2017-12-07 @ 9:00 am	< 0.3	2017-12-11
7978757	STAFF	2017-12-04 @ 10:00 am	2017-12-07 @ 8:00 am	< 0.3	2017-12-11
7978793	WORK AREA	2017-12-04 @ 9:00 am	2017-12-07 @ 8:00 am	< 0.3	2017-12-11
7978758	WORK RM	2017-12-04 @ 10:00 am	2017-12-07 @ 8:00 am	0.8 ± 0.3	2017-12-12
7978785	WR	2017-12-04 @ 8:00 am	2017-12-07 @ 8:00 am	< 0.3	2017-12-11
7978777	WR2	2017-12-04 @ 8:00 am	2017-12-07 @ 8:00 am	0.7 ± 0.3	2017-12-11





## Radon Test Kit Chain of Custody

Project Name: MCPS Radon Phase

Names of Schools:

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

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

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

Radon test result report for:**TRANSIT 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: DuFief Elementary School

Date of Test Report:	5/27/2016
Round of Testing:	Initial Follow-up Post Remediation
# Rooms Tested:	50
# Rooms $\geq$ 4.0 pCi/L:	0
Low Value:	< 0.3
High Value:	0.7

### 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: DuFief Elementary School  
15001 DuFief Drive  
Gaithersburg, MD 20878

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 DuFief Elementary School, located at 15001 DuFief Drive in Gaithersburg, Maryland 20878 (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 16, 2016 and deployed sixty (60) 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 19, 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		
Dufief Elementary School		
Test Period: 05/16/16-05/19/16		
Kit Number	Room / Area	Result
7756634	1	< 0.3
7756664	2	< 0.3
7756633	3	< 0.3
7756655	4	< 0.3
7756688	5	< 0.3
7756658	6	< 0.3
7756693	7	< 0.3
7756680	8	< 0.3
7756695	9	< 0.3
7756661	10	< 0.3
7756670	11	< 0.3
7756662	12	< 0.3
7756691	13	< 0.3
7756692	14	< 0.3
7756697	15	0.5
7756667	16	0.5
7756666	17	< 0.3
7756674	18	< 0.3
7756665	19	0.6
7756699	20	< 0.3
7756698	21	< 0.3
7756648	22	< 0.3
7756689	23	< 0.3
7756682	24	< 0.3
7756676	25	< 0.3
7756629	ART	< 0.3
7756675	BSO	0.6
7756635	COMP	< 0.3
7756663	COMP 2	< 0.3
7756678	CONF	< 0.3
7756679	COUNS	< 0.3
7756684	CR-20	< 0.3
7756621	DR	< 0.3
7756668	GYM	< 0.3
7756672	GYM	< 0.3
7756686	HEALTH	< 0.3
7756700	IDA	< 0.3
7756657	IMC	< 0.3
7756656	IMC	< 0.3
7756631	K1	< 0.3
7756625	K2	< 0.3
7756694	MAIN OFFICE	< 0.3
7756659	MP	< 0.3
7756671	MPR	0.6
7756673	MPR	< 0.3
7756636	MUS	< 0.3

Table Note:

\* Missing or Compromised Sample

Radon Testing Results		
Dufief Elementary School		
Test Period: 05/16/16-05/19/16		
Kit Number	Room / Area	Result
7756669	PE	0.5
7756681	PRN	< 0.3
7756647	RSC	< 0.3
7756627	S&H	< 0.3
7756677	STAFF	< 0.3
7756685	WR	0.7
7756660	WR2	< 0.3

Table Note:

\* Missing or Compromised Sample

Radon Testing Results		
Dufief Elementary School		
Test Period: 05/16/16-05/19/16		
Kit Number	QC Type	Result
7756623	D (COMP)	< 0.3
7756687	D (HEALTH)	< 0.3
7756632	D (K2)	< 0.3
7756696	D (MAIN OFFICE)	0.5
7756690	D (WR)	< 0.3
7756622	FB (DR)	< 0.3
7756683	FB (STAFF)	< 0.3

Table Note:

\* Missing or Compromised Sample

## ATTACHMENT C

### Laboratory Analytical Results

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

Radon test result report for:

**DUFIEF ELEMENTARY SCHOOL  
MAIN**

Kit #	Room Id	Started	Ended	pCi/L	Analyzed
7756634	1	2016-05-16 @ 8:00 am	2016-05-19 @ 8:00 am	< 0.3	2016-05-23
7756661	10	2016-05-16 @ 8:00 am	2016-05-19 @ 8:00 am	< 0.3	2016-05-23
7756670	11	2016-05-16 @ 8:00 am	2016-05-19 @ 8:00 am	< 0.3	2016-05-23
7756662	12	2016-05-16 @ 8:00 am	2016-05-19 @ 8:00 am	< 0.3	2016-05-23
7756691	13	2016-05-16 @ 8:00 am	2016-05-19 @ 8:00 am	< 0.3	2016-05-23
7756692	14	2016-05-16 @ 8:00 am	2016-05-19 @ 8:00 am	< 0.3	2016-05-23
7756697	15	2016-05-16 @ 8:00 am	2016-05-19 @ 8:00 am	0.5 ± 0.2	2016-05-23
7756667	16	2016-05-16 @ 8:00 am	2016-05-19 @ 8:00 am	0.5 ± 0.2	2016-05-23
7756666	17	2016-05-16 @ 8:00 am	2016-05-19 @ 8:00 am	< 0.3	2016-05-23
7756674	18	2016-05-16 @ 8:00 am	2016-05-19 @ 8:00 am	< 0.3	2016-05-23
7756664	2	2016-05-16 @ 8:00 am	2016-05-19 @ 8:00 am	< 0.3	2016-05-23
7756684	CR20	2016-05-16 @ 8:00 am	2016-05-19 @ 8:00 am	< 0.3	2016-05-23
7756648	22	2016-05-16 @ 8:00 am	2016-05-19 @ 8:00 am	< 0.3	2016-05-23
7756689	23	2016-05-16 @ 8:00 am	2016-05-19 @ 8:00 am	< 0.3	2016-05-23
7756682	24	2016-05-16 @ 8:00 am	2016-05-19 @ 8:00 am	< 0.3	2016-05-23
7756676	25	2016-05-16 @ 8:00 am	2016-05-19 @ 8:00 am	< 0.3	2016-05-23
7756625	K2	2016-05-16 @ 7:00 am	2016-05-19 @ 8:00 am	< 0.3	2016-05-23
7756632	K2	2016-05-16 @ 7:00 am	2016-05-19 @ 8:00 am	< 0.3	2016-05-23
7756631	K1	2016-05-16 @ 7:00 am	2016-05-19 @ 8:00 am	< 0.3	2016-05-23
7756633	3	2016-05-16 @ 8:00 am	2016-05-19 @ 8:00 am	< 0.3	2016-05-23
7756655	4	2016-05-16 @ 8:00 am	2016-05-19 @ 8:00 am	< 0.3	2016-05-23
7756688	5	2016-05-16 @ 8:00 am	2016-05-19 @ 8:00 am	< 0.3	2016-05-23
7756658	6	2016-05-16 @ 8:00 am	2016-05-19 @ 8:00 am	< 0.3	2016-05-23
7756693	7	2016-05-16 @ 8:00 am	2016-05-19 @ 8:00 am	< 0.3	2016-05-23
7756680	8	2016-05-16 @ 8:00 am	2016-05-19 @ 8:00 am	< 0.3	2016-05-23
7756695	9	2016-05-16 @ 8:00 am	2016-05-19 @ 8:00 am	< 0.3	2016-05-23
7756629	ART	2016-05-16 @ 7:00 am	2016-05-19 @ 7:00 am	< 0.3	2016-05-23
7756675	BSO	2016-05-16 @ 6:00 am	2016-05-19 @ 6:00 am	0.6 ± 0.2	2016-05-23
7756623	COMP	2016-05-16 @ 7:00 am	2016-05-19 @ 8:00 am	< 0.3	2016-05-23
7756635	COMP	2016-05-16 @ 7:00 am	2016-05-19 @ 8:00 am	< 0.3	2016-05-23
7756663	COMP 2	2016-05-16 @ 8:00 am	2016-05-19 @ 8:00 am	< 0.3	2016-05-23
7756678	CONF	2016-05-16 @ 8:00 am	2016-05-19 @ 8:00 am	< 0.3	2016-05-23
7756679	COUNS	2016-05-16 @ 8:00 am	2016-05-19 @ 8:00 am	< 0.3	2016-05-23
7756621	DR	2016-05-16 @ 8:00 am	2016-05-19 @ 8:00 am	< 0.3	2016-05-23
7756622	DR	2016-05-16 @ 8:00 am	2016-05-19 @ 8:00 am	< 0.3	2016-05-23
7756668	GYM	2016-05-16 @ 8:00 am	2016-05-19 @ 8:00 am	< 0.3	2016-05-23
7756672	GYM	2016-05-16 @ 8:00 am	2016-05-19 @ 8:00 am	< 0.3	2016-05-23



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

Radon test result report for:

**DUFIEF ELEMENTARY SCHOOL  
MAIN**

Kit #	Room Id	Started	Ended	pCi/L	Analyzed
7756686	HEALTH	2016-05-16 @ 7:00 am	2016-05-19 @ 7:00 am	< 0.3	2016-05-23
7756687	HEALTH	2016-05-16 @ 7:00 am	2016-05-19 @ 7:00 am	< 0.3	2016-05-23
7756700	IDA	2016-05-16 @ 8:00 am	2016-05-19 @ 8:00 am	< 0.3	2016-05-23
7756656	IMC	2016-05-16 @ 7:00 am	2016-05-19 @ 7:00 am	< 0.3	2016-05-23
7756657	IMC	2016-05-16 @ 7:00 am	2016-05-19 @ 7:00 am	< 0.3	2016-05-23
7756694	MAIN OFFICE	2016-05-16 @ 7:00 am	2016-05-19 @ 7:00 am	< 0.3	2016-05-23
7756696	MAIN OFFICE	2016-05-16 @ 7:00 am	2016-05-19 @ 7:00 am	0.5 ± 0.2	2016-05-23
7756659	MP	2016-05-16 @ 7:00 am	2016-05-19 @ 7:00 am	< 0.3	2016-05-23
7756671	MPR	2016-05-16 @ 6:00 am	2016-05-19 @ 6:00 am	0.6 ± 0.2	2016-05-23
7756673	MPR	2016-05-16 @ 6:00 am	2016-05-19 @ 6:00 am	< 0.3	2016-05-23
7756636	MUS	2016-05-16 @ 8:00 am	2016-05-19 @ 8:00 am	< 0.3	2016-05-23
7756669	PE	2016-05-16 @ 8:00 am	2016-05-19 @ 8:00 am	0.5 ± 0.2	2016-05-23
7756681	PRN	2016-05-16 @ 8:00 am	2016-05-19 @ 8:00 am	< 0.3	2016-05-23
7756647	RSC	2016-05-16 @ 8:00 am	2016-05-19 @ 8:00 am	< 0.3	2016-05-23
7756627	S&H	2016-05-16 @ 7:00 am	2016-05-19 @ 7:00 am	< 0.3	2016-05-23
7756665	19	2016-05-16 @ 8:00 am	2016-05-19 @ 8:00 am	0.6 ± 0.2	2016-05-23
7756699	20	2016-05-16 @ 8:00 am	2016-05-19 @ 8:00 am	< 0.3	2016-05-23
7756698	21	2016-05-16 @ 8:00 am	2016-05-19 @ 8:00 am	< 0.3	2016-05-23
7756683	STAFF	2016-05-16 @ 7:00 am	2016-05-19 @ 7:00 am	< 0.3	2016-05-23
7756677	STAFF	2016-05-16 @ 7:00 am	2016-05-19 @ 7:00 am	< 0.3	2016-05-23
7756685	WR	2016-05-16 @ 7:00 am	2016-05-19 @ 7:00 am	0.7 ± 0.3	2016-05-23
7756690	WR	2016-05-16 @ 7:00 am	2016-05-19 @ 7:00 am	< 0.3	2016-05-23
7756660	WR2	2016-05-16 @ 7:00 am	2016-05-19 @ 7:00 am	< 0.3	2016-05-23

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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 DUFIEF ES ELEMENTARY SCHOOL

15001 Dufief Drive, Gaithersburg, Maryland 20878

## EXECUTIVE SUMMARY

Date of Test Report:	3/2/16 (Rev 1) Follow-Up
Round of Testing:	Initial Follow-up Post Remediation
# Rooms Tested	34
# Rooms $\geq$ 4.0 pCi/L:	11
Low Value:	1.8
High Value:	8.6
Confirmed Rooms $\geq$ 4.0 pCi/L US EPA Action Level	19

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

Room	Result (pCi/L) 1/20/16 Initial	Result (pCi/L) 3/2/16 (Rev 1) Follow-Up	Average Result (pCi/L)
IDA	9.7	Not tested	9.7
PE	9.5	6.6	8.1
MPR	7.8	2.8	5.8
Staff	7.3	6.7	7.0
MPR	6.9	4.4	5.7
Principal	6.2	4.2	5.2
Room 10	5.8	2.9	4.4
Main Office	5.7	3.2	4.5
Room 19	5.7	6.8	6.3
Gym	5.6	4.4	5.0
Gym	5.3	3.8	4.6
Art	5.3	2.8	4.1
WR	5.1	5.3	5.2
Room 23	5.1	5.5	5.3
Room 11	5.1	3.7	4.4
Counselor	5.1	3.6	4.4
Room 12	4.4	4.1	4.3
IMC	4.1	3.0	3.6
Room 17	4.1	2.0	3.1
Conference	4.0	3.4	3.7
Comp	4.0	2.7	3.4
Room 21	4.0	2.7	3.4
Room 24	4.0	2.7	3.4
Room 16	3.4	3.2	3.3



Room 18	3.8	2.5	3.2
Room 20	3.6	3.2	3.4
Room 25	3.8	2.7	3.3
Room 3	3.6	8.6	6.1
Room 5	3.8	4.1	4.0
Room 6	3.2	3.1	3.2
Room 7	3.8	2.3	3.1
Room 9	3.7	2.3	3.0
COMP2	3.3	Not tested	---
BSO	3.7	1.9	2.8
HEALTH	2.8	2.8	2.8
MUS	3.2	2.3	2.8
RSC	3.9	Not tested	---



## MCPS RADON TESTING

### Executive Summary: DuFief Elementary School

Date of Test Report:	3/2/2016 (Rev 1)
Round of Testing:	Initial Follow-up Post Remediation
# Rooms Tested:	34
# Rooms $\geq$ 4.0 pCi/L:	11
Low Value:	1.8
High Value:	8.6

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

Room 3 (8.6 pCi/L), Room 19 (6.8 pCi/L), STAFF (6.7 pCi/L), PE (6.6 pCi/L), Room 23 (5.5 pCi/L), WR (5.3 pCi/L), Gym (4.4 pCi/L), MPR (4.4 pCi/L), PRN (4.2 pCi/L), Room 5 (4.1 pCi/L), Room 12 (4.1 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.

Additional rooms that need re-testing:

Comp 2, RSC



ENGINEERS • PLANNERS • SCIENTISTS • CONSTRUCTION MANAGERS

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

March 2, 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 # 12146341.26

Location: DuFief Elementary School  
15001 DuFief Drive  
Gaithersburg, MD 20878

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 DuFief Elementary School, located at 15001 Dufief Drive in Gaithersburg, Maryland 20878 (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 forty (40) 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>	3	8.6
	19	6.8
	STAFF	6.7
	PE	6.6
	23	5.5
	WR	5.3
	Gym	4.4
	MPR	2.8, 4.4(D)
	PRN	4.2
	5	4.1
	12	4.1
<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		
Dufief Elementary School		
Test Period: 02/08/16-02/11/16		
Kit Number	Room / Area	Result
7717277	3	8.6
7717278	5	4.1
7717276	6	3.1
7717275	7	2.3
7717274	9	2.3
7717272	10	2.9
7717273	11	3.7
7717271	12	4.1
7717270	16	3.2
7717269	17	2.0
7717268	18	2.5
7717285	19	6.8
7717284	20	3.2
7717286	21	2.7
7717290	23	5.5
7717289	24	2.7
7717287	25	2.7
7717283	ART	2.8
7717261	BSO	1.9
7717280	COMP	2.7
7717255	CONF	3.4
7717260	COUNS	3.6
7717266	GYM	3.8
7717267	GYM	4.4
7717258	HEALTH	2.8
7721401	IMC	3.0
7726747	MAIN OFFICE	3.2
7717263	MPR	2.8
7717262	MUS	2.3
7717265	PE	6.6
7717238	PRN	4.2
7717282	S&H	1.8
7717259	STAFF LOUNGE	6.7
7717256	WR	5.3
7717279	WR2	2.8

Table Note:

\* Missing or Compromised Sample

Radon Testing Results		
Dufief Elementary School		
Test Period: 02/08/16-02/11/16		
Kit Number	QC Type	Result
7717288	D (25)	2.2
7717281	D (COMP)	3.1
7717257	D (COUNS)	3.7
7717264	D (MPR)	4.4
7721431	FB (MAIN OFFICE)	< 0.3

Table Note:

\* Missing or Compromised Sample

## ATTACHMENT C

### Laboratory Analytical Results

February 19, 2016

**LABORATORY ANALYSIS  
REPORT \*\***

Radon test result report for:

**DUFIEF ELEMENTARY SCHOOL  
MAIN**

Kit #	Room Id	Started	Ended	pCi/L	Analyzed
7717271	12	2016-02-08 @ 12:00 pm	2016-02-11 @ 1:00 pm	4.1 ± 0.4	2016-02-15
7717273	11	2016-02-08 @ 12:00 pm	2016-02-11 @ 1:00 pm	3.7 ± 0.4	2016-02-15
7717272	10	2016-02-08 @ 12:00 pm	2016-02-11 @ 1:00 pm	2.9 ± 0.3	2016-02-15
7717270	16	2016-02-08 @ 12:00 pm	2016-02-11 @ 1:00 pm	3.2 ± 0.4	2016-02-15
7717269	17	2016-02-08 @ 12:00 pm	2016-02-11 @ 1:00 pm	2.0 ± 0.3	2016-02-15
7717268	18	2016-02-08 @ 12:00 pm	2016-02-11 @ 1:00 pm	2.5 ± 0.3	2016-02-15
7717285	19	2016-02-08 @ 1:00 pm	2016-02-11 @ 1:00 pm	6.8 ± 0.5	2016-02-15
7717284	20	2016-02-08 @ 1:00 pm	2016-02-11 @ 1:00 pm	3.2 ± 0.4	2016-02-15
7717286	21	2016-02-08 @ 1:00 pm	2016-02-11 @ 1:00 pm	2.7 ± 0.3	2016-02-15
7717290	23	2016-02-08 @ 1:00 pm	2016-02-11 @ 1:00 pm	5.5 ± 0.5	2016-02-15
7717289	24	2016-02-08 @ 1:00 pm	2016-02-11 @ 1:00 pm	2.7 ± 0.4	2016-02-15
7717287	25	2016-02-08 @ 1:00 pm	2016-02-11 @ 1:00 pm	2.7 ± 0.3	2016-02-15
7717288	25	2016-02-08 @ 1:00 pm	2016-02-11 @ 1:00 pm	2.2 ± 0.3	2016-02-15
7717277	3	2016-02-08 @ 12:00 pm	2016-02-11 @ 1:00 pm	8.6 ± 0.5	2016-02-15
7717278	5	2016-02-08 @ 12:00 pm	2016-02-11 @ 1:00 pm	4.1 ± 0.4	2016-02-15
7717276	6	2016-02-08 @ 12:00 pm	2016-02-11 @ 1:00 pm	3.1 ± 0.4	2016-02-15
7717275	7	2016-02-08 @ 12:00 pm	2016-02-11 @ 1:00 pm	2.3 ± 0.3	2016-02-15
7717274	9	2016-02-08 @ 12:00 pm	2016-02-11 @ 1:00 pm	2.3 ± 0.3	2016-02-15
7717263	MPR	2016-02-08 @ 11:00 am	2016-02-11 @ 1:00 pm	2.8 ± 0.4	2016-02-15
7717264	MPR	2016-02-08 @ 11:00 am	2016-02-11 @ 1:00 pm	4.4 ± 0.4	2016-02-15
7717283	ART	2016-02-08 @ 12:00 pm	2016-02-11 @ 1:00 pm	2.8 ± 0.3	2016-02-15
7717261	BSO	2016-02-08 @ 11:00 am	2016-02-11 @ 1:00 pm	1.9 ± 0.3	2016-02-15
7717280	COMP	2016-02-08 @ 12:00 pm	2016-02-11 @ 1:00 pm	2.7 ± 0.3	2016-02-15
7717281	COMP	2016-02-08 @ 12:00 pm	2016-02-11 @ 1:00 pm	3.1 ± 0.4	2016-02-15
7717255	CONF	2016-02-08 @ 11:00 am	2016-02-11 @ 1:00 pm	3.4 ± 0.4	2016-02-15
7717257	COUNS	2016-02-08 @ 11:00 am	2016-02-11 @ 1:00 pm	3.7 ± 0.4	2016-02-15
7717260	COUNS	2016-02-08 @ 11:00 am	2016-02-11 @ 1:00 pm	3.6 ± 0.4	2016-02-15
7717266	GYM	2016-02-08 @ 12:00 pm	2016-02-11 @ 1:00 pm	3.8 ± 0.4	2016-02-15
7717267	GYM	2016-02-08 @ 12:00 pm	2016-02-11 @ 1:00 pm	4.4 ± 0.4	2016-02-15
7717265	PE	2016-02-08 @ 12:00 pm	2016-02-11 @ 1:00 pm	6.6 ± 0.5	2016-02-15
7717258	HEALTH	2016-02-08 @ 11:00 am	2016-02-11 @ 1:00 pm	2.8 ± 0.4	2016-02-15
7717279	WR2	2016-02-08 @ 12:00 pm	2016-02-11 @ 1:00 pm	2.8 ± 0.3	2016-02-15
7721431	MAIN OFFICE	2016-02-08 @ 11:00 am	2016-02-11 @ 1:00 pm	< 0.3	2016-02-15
7726747	MAIN OFFICE	2016-02-08 @ 11:00 am	2016-02-11 @ 1:00 pm	3.2 ± 0.4	2016-02-15
7721401	IMC	2016-02-08 @ 12:00 pm	2016-02-11 @ 1:00 pm	3.0 ± 0.3	2016-02-15
7717262	MUS	2016-02-08 @ 11:00 am	2016-02-11 @ 1:00 pm	2.3 ± 0.3	2016-02-15
7717238	PRN	2016-02-08 @ 11:00 am	2016-02-11 @ 1:00 pm	4.2 ± 0.4	2016-02-15

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February 19, 2016

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

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

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Kit #	Room Id	Started	Ended	pCi/L	Analyzed
7717282	S&H	2016-02-08 @ 12:00 pm	2016-02-11 @ 1:00 pm	1.8 ± 0.3	2016-02-15
7717259	STAFF	2016-02-08 @ 11:00 am	2016-02-11 @ 1:00 pm	6.7 ± 0.5	2016-02-15
7717256	WR	2016-02-08 @ 11:00 am	2016-02-11 @ 1:00 pm	5.3 ± 0.4	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

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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        |

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

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



## MCPS RADON TESTING

### Executive Summary: DuFief Elementary School

Date of Test Report:	1/20/2016
Round of Testing:	Initial Follow-up Post Remediation
# Rooms Tested:	50
# Rooms $\geq$ 4.0 pCi/L:	24
Low Value:	1.9
High Value:	9.7

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

IDA (9.7 pCi/L), PE (9.5 pCi/L), MPR (7.8 pCi/L), Staff (7.3 pCi/L), MPR (6.9 pCi/L), Principal (6.2 pCi/L), Room 10 (5.8 pCi/L), Main Office (5.7 pCi/L), Room 19 (5.7 pCi/L), Gym (5.6 pCi/L), Gym (5.3 pCi/L), Art (5.3 pCi/L), WR (5.1 pCi/L), Room 23 (5.1 pCi/L), Room 11 (5.1 pCi/L), Counselor (5.1 pCi/L), Counselor (4.4 pCi/L), Room 12 (4.4 pCi/L), IMC (4.1 pCi/L), Room 17 (4.1 pCi/L), Conference (4.0 pCi/L), Comp (4.0 pCi/L), Room 21 (4.0 pCi/L), Room 24 (4.0 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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January 20, 2016

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

Re: **Radon Testing Services**  
KCI Job # 12146341.21

Location: DuFief Elementary School  
15001 DuFief Drive  
Gaithersburg, MD 20878

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 DuFief Elementary School, located at 15001 DuFief Drive in Gaithersburg, Maryland 20878 (subject site).

**Scope of Services:**

KCI conducted radon testing at the subject site to evaluate indoor radon levels relative to the USEPA's recommended action level of 4.0 picocuries per Liter (pCi/L) - the level at which EPA recommends that schools take action to reduce the level. KCI conducted the radon testing in accordance with American Association of Radon Scientists and Technologists (AARST) *Protocol for Conducting Measurements of Radon and Radon Decay Products in Schools and Large Buildings*. A National Radon Safety Board (NRSB) Radon Measurement Specialist (certification #14SS056) supervised the testing. Additional information on radon management and the health effects of radon exposure is available from [www.montgomerycountymd.gov/dep/air/radon](http://www.montgomerycountymd.gov/dep/air/radon) or [www.epa.gov/radon](http://www.epa.gov/radon).

KCI visited the site on December 28, 2015 and deployed fifty-eight (58) activated charcoal (AC) radon test kits. KCI deployed radon test kits in frequently-occupied ground contact rooms, and other areas, (if applicable) in accordance with AARST guidance. A floor plan map of the building with the test locations is included as Attachment A of this report.

As a quality control measure, KCI included duplicate samples, field blanks, lab transit blanks, and office blanks in accordance with AARST recommendations. In addition, KCI submitted six (6) test kits to Bowser-Morner, Inc. as spike samples. The spiked tests were exposed to a known radon concentration by Bowser-Morner prior to being returned to the laboratory for analysis.

KCI returned to the site on December 31, 2015 to retrieve the radon sampling test kits. KCI shipped all radon tests via overnight delivery to Airchek, Inc. for analysis by gamma-ray spectroscopy. Airchek, Inc. is a NRSB certified analytical laboratory for radon analysis (certification # ARL1402) located at 1936

Butler Bridge Road, Mills River, North Carolina.

**Evaluation of Testing Conditions:**

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

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:

Radon Concentration	Room	Result
$\geq 4.0\text{ pCi/L}$	IDA	9.7
	PE	9.5
	MPR	7.8
	Staff	7.3
	MPR	6.9
	Principal	6.2, 5.8(D)
	10	5.8
	Main Office	5.7, 4.6(D)
	19	5.7
	Gym	5.6
	Gym	5.3
	Art	5.3
	23	5.1
	11	5.1
	22	5.0
	WR	4.8, 5.1(D)
	Counselor	4.4, 5.1(D)
	12	4.4
	IMC	4.1
	17	4.1
	Conference	4.0

Radon Concentration	Room	Result
≥4.0 pCi/L	Comp	4.0
	21	4.0
	24	4.0
<4.0 pCi/L	See Attachment B	

Notes:

D- Duplicate sample

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

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

Our professional services have been performed in accordance with customary principles and practices in the field of industrial hygiene and engineering. If you have any questions or comments regarding this report, please feel free to contact me at (410) 316-7800.

Sincerely,



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 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		
DuFief ES		
Test Period: 12/28/15-12/31/15		
Kit Number	Room / Area	Result
7708852	1	2.3
7708847	2	2.6
7708853	3	3.6
7708858	4	1.9
7708850	5	3.8
7708849	6	3.2
7708845	7	3.8
7708846	8	2.9
7708848	9	3.7
7708844	10	5.8
7708843	11	5.1
7708842	12	4.4
7708829	13	2.7
7708828	14	2.5
7708825	15	2
7708824	16	3.4
7708827	17	4.1
7708821	18	3.8
7708835	19	5.7
7708836	20	3.6
7708838	21	4
7708837	22	5
7708840	23	5.1
7708839	24	4
7708841	25	3.8
7708855	ART	5.3
7708819	BSO	3.7
7708831	COMP	4
7708834	COMP2	3.3
7708816	CONF	4
7708815	COUNS	4.4
7708814	* GYM (knocked down)	5.3
7708817	* GYM (knocked down)	5.6
7708803	HEALTH	2.8
7708856	IDA	9.7
7708826	IMC	4.1
7708830	IMC	3.8
7708851	K1	2.8
7708854	K2	3.1
7708801	MAIN OFFICE	5.7
7708818	MPR	7.8
7708820	MPR	6.9
7708823	MUS	3.2
7708822	PE	9.5
7708811	PRN	6.2
7708832	RSC	3.9

Table Note:

\* Missing or Compromised Sample

Radon Testing Results		
DuFief ES		
Test Period: 12/28/15-12/31/15		
Kit Number	Room / Area	Result
7708857	S&H	2.9
7708812	STAFF	7.3
7708805	WR	4.8
7708833	WR2	3.1

Table Note:

\* Missing or Compromised Sample

Radon Testing Results		
DuFief ES		
Test Period: 12/28/15-12/31/15		
Kit Number	QC Type	Result
7708860	D (COUNS)	5.1
7708804	D (HEALTH)	3.6
7708802	D (MAIN OFFICE)	4.6
7708861	D (PRN)	5.8
7708813	D (WR)	5.1
7708859	FB (CONF)	< 0.3
7708808	FB (STAFF)	< 0.3
7708964	OB (0)	< 0.3

Table Note:

\* Missing or Compromised Sample

## ATTACHMENT C

### Laboratory Analytical Results

January 16, 2016

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

Radon test result report for:

**DUFIEF ES  
MAIN**

Kit #	Room Id	Started	Ended	pCi/L	Analyzed
7708964	0	2015-12-28 @ 12:00 pm	2015-12-31 @ 1:00 pm	< 0.3	2016-01-05
7708852	1	2015-12-28 @ 11:00 am	2015-12-31 @ 9:00 am	2.3 ± 0.5	2016-01-05
7708844	10	2015-12-28 @ 10:00 am	2015-12-31 @ 9:00 am	5.8 ± 0.7	2016-01-05
7708843	11	2015-12-28 @ 10:00 am	2015-12-31 @ 9:00 am	5.1 ± 0.6	2016-01-05
7708842	12	2015-12-28 @ 10:00 am	2015-12-31 @ 9:00 am	4.4 ± 0.6	2016-01-05
7708829	13	2015-12-28 @ 9:00 am	2015-12-31 @ 9:00 am	2.7 ± 0.5	2016-01-05
7708828	14	2015-12-28 @ 9:00 am	2015-12-31 @ 9:00 am	2.5 ± 0.5	2016-01-05
7708825	15	2015-12-28 @ 9:00 am	2015-12-31 @ 9:00 am	2.0 ± 0.4	2016-01-05
7708824	16	2015-12-28 @ 9:00 am	2015-12-31 @ 9:00 am	3.4 ± 0.5	2016-01-05
7708827	17	2015-12-28 @ 9:00 am	2015-12-31 @ 9:00 am	4.1 ± 0.6	2016-01-05
7708821	18	2015-12-28 @ 9:00 am	2015-12-31 @ 9:00 am	3.8 ± 0.5	2016-01-05
7708835	19	2015-12-28 @ 10:00 am	2015-12-31 @ 9:00 am	5.7 ± 0.6	2016-01-05
7708847	2	2015-12-28 @ 11:00 am	2015-12-31 @ 9:00 am	2.6 ± 0.5	2016-01-05
7708836	20	2015-12-28 @ 10:00 am	2015-12-31 @ 9:00 am	3.6 ± 0.5	2016-01-05
7708838	21	2015-12-28 @ 10:00 am	2015-12-31 @ 9:00 am	4.0 ± 0.5	2016-01-05
7708837	22	2015-12-28 @ 10:00 am	2015-12-31 @ 9:00 am	5.0 ± 0.6	2016-01-05
7708840	23	2015-12-28 @ 10:00 am	2015-12-31 @ 9:00 am	5.1 ± 0.6	2016-01-05
7708839	24	2015-12-28 @ 10:00 am	2015-12-31 @ 9:00 am	4.0 ± 0.5	2016-01-05
7708841	25	2015-12-28 @ 10:00 am	2015-12-31 @ 9:00 am	3.8 ± 0.5	2016-01-05
7708853	3	2015-12-28 @ 11:00 am	2015-12-31 @ 9:00 am	3.6 ± 0.5	2016-01-05
7708858	4	2015-12-28 @ 11:00 am	2015-12-31 @ 9:00 am	1.9 ± 0.5	2016-01-05
7708850	5	2015-12-28 @ 11:00 am	2015-12-31 @ 9:00 am	3.8 ± 0.5	2016-01-05
7708849	6	2015-12-28 @ 10:00 am	2015-12-31 @ 9:00 am	3.2 ± 0.5	2016-01-05
7708845	7	2015-12-28 @ 10:00 am	2015-12-31 @ 9:00 am	3.8 ± 0.5	2016-01-05
7708846	8	2015-12-28 @ 10:00 am	2015-12-31 @ 9:00 am	2.9 ± 0.5	2016-01-05
7708848	9	2015-12-28 @ 10:00 am	2015-12-31 @ 9:00 am	3.7 ± 0.5	2016-01-05
7708855	ART	2015-12-28 @ 11:00 am	2015-12-31 @ 9:00 am	5.3 ± 0.6	2016-01-05
7708819	BSO	2015-12-28 @ 9:00 am	2015-12-31 @ 9:00 am	3.7 ± 0.5	2016-01-05
7708831	COMP	2015-12-28 @ 10:00 am	2015-12-31 @ 9:00 am	4.0 ± 0.6	2016-01-05
7708834	COMP2	2015-12-28 @ 10:00 am	2015-12-31 @ 9:00 am	3.3 ± 0.5	2016-01-05
7708816	CONF	2015-12-28 @ 9:00 am	2015-12-31 @ 9:00 am	4.0 ± 0.5	2016-01-05
7708859	CONF	2015-12-28 @ 11:00 am	2015-12-31 @ 9:00 am	< 0.3	2016-01-05
7708815	COUNS	2015-12-28 @ 9:00 am	2015-12-31 @ 9:00 am	4.4 ± 0.6	2016-01-05
7708860	COUNS	2015-12-28 @ 11:00 am	2015-12-31 @ 9:00 am	5.1 ± 0.6	2016-01-05
7708814	GYM	2015-12-28 @ 9:00 am	2015-12-31 @ 9:00 am	5.3 ± 0.6	2016-01-05
7708817	GYM	2015-12-28 @ 9:00 am	2015-12-31 @ 9:00 am	5.6 ± 0.6	2016-01-05
7708803	HEALTH	2015-12-28 @ 9:00 am	2015-12-31 @ 9:00 am	2.8 ± 0.5	2016-01-05

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

Radon test result report for:

**DUFIEF ES  
MAIN**

Kit #	Room Id	Started	Ended	pCi/L	Analyzed
7708804	HEALTH	2015-12-28 @ 9:00 am	2015-12-31 @ 9:00 am	3.6 ± 0.5	2016-01-05
7708856	IDA	2015-12-28 @ 11:00 am	2015-12-31 @ 9:00 am	9.7 ± 0.9	2016-01-05
7708830	IMC	2015-12-28 @ 10:00 am	2015-12-31 @ 9:00 am	3.8 ± 0.6	2016-01-05
7708826	IMC	2015-12-28 @ 10:00 am	2015-12-31 @ 9:00 am	4.1 ± 0.6	2016-01-05
7708851	K1	2015-12-28 @ 11:00 am	2015-12-31 @ 9:00 am	2.8 ± 0.5	2016-01-05
7708854	K2	2015-12-28 @ 11:00 am	2015-12-31 @ 9:00 am	3.1 ± 0.5	2016-01-05
7708801	MAIN OFFICE	2015-12-28 @ 9:00 am	2015-12-31 @ 8:00 am	5.7 ± 0.7	2016-01-05
7708802	MAIN OFFICE	2015-12-28 @ 9:00 am	2015-12-31 @ 8:00 am	4.6 ± 0.6	2016-01-05
7708818	MPR	2015-12-28 @ 9:00 am	2015-12-31 @ 9:00 am	7.8 ± 0.8	2016-01-05
7708820	MPR	2015-12-28 @ 9:00 am	2015-12-31 @ 9:00 am	6.9 ± 0.7	2016-01-05
7708823	MUS	2015-12-28 @ 9:00 am	2015-12-31 @ 9:00 am	3.2 ± 0.5	2016-01-05
7708822	PE	2015-12-28 @ 9:00 am	2015-12-31 @ 9:00 am	9.5 ± 0.9	2016-01-05
7708811	PRN	2015-12-28 @ 9:00 am	2015-12-31 @ 9:00 am	6.2 ± 0.7	2016-01-05
7708861	PRN	2015-12-28 @ 11:00 am	2015-12-31 @ 9:00 am	5.8 ± 0.6	2016-01-05
7708832	RSC	2015-12-28 @ 10:00 am	2015-12-31 @ 9:00 am	3.9 ± 0.6	2016-01-05
7708857	S&H	2015-12-28 @ 11:00 am	2015-12-31 @ 9:00 am	2.9 ± 0.5	2016-01-05
7708808	STAFF	2015-12-28 @ 9:00 am	2015-12-31 @ 9:00 am	< 0.3	2016-01-05
7708812	STAFF	2015-12-28 @ 9:00 am	2015-12-31 @ 9:00 am	7.3 ± 0.8	2016-01-05
7708805	WR	2015-12-28 @ 9:00 am	2015-12-31 @ 9:00 am	4.8 ± 0.6	2016-01-05
7708813	WR	2015-12-28 @ 9:00 am	2015-12-31 @ 9:00 am	5.1 ± 0.6	2016-01-05
7708833	WR2	2015-12-28 @ 10:00 am	2015-12-31 @ 9:00 am	3.1 ± 0.5	2016-01-05

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

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

December  
23,  
2015

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

Spike Sample Laboratory Results

Radon test result report for:  
**MCPS**

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

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



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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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## Chain of Custody

Project Name: MCPS Radon Phase III

Name of Schools:

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

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

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