

## School / Facility Radon Testing Report Form

School Year: **24-25**

Facility:	Highland Elementary School		
Address:	3100 Medway Street		
	Wheaton, MD 20902		
Reason for Testing:	Scheduled Re-Testing - <input checked="" type="checkbox"/> 2-year or <input type="checkbox"/> 5-year schedule <input type="checkbox"/> Clearance Testing (Post-Mitigation) <input type="checkbox"/> Building Envelope or HVAC Upgrades <input type="checkbox"/> New Construction – Addition or Facility		
Current Radon Status:	<input checked="" type="checkbox"/> Active Mitigation (2-year regular schedule) <input type="checkbox"/> No Active Mitigation (5-year regular schedule) <input type="checkbox"/> Not Previously Tested (New Facility)		
Round of Testing:	<input checked="" type="checkbox"/> Initial Testing -or- <input type="checkbox"/> Follow-up Testing		
Testing Status:	<input checked="" type="checkbox"/> No Further Testing Needed -or- <input type="checkbox"/> Follow-Up Testing Required		

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

Mitigation -	Facility Radon Status:		
<input checked="" type="checkbox"/> Not Required <input type="checkbox"/> Required ( $\geq 4.0$ -pCi/L) Rooms:	<input checked="" type="checkbox"/> No Change in Status <input type="checkbox"/> Active Mitigation (2-year regular schedule) <input type="checkbox"/> No Active Mitigation (5-year regular schedule)		
Number of Rooms Tested	66	Lowest Value (pCi/L)	< 0.3
Number of Rooms ( $\geq 4.0$ -pCi/L)	0	Highest Value (pCi/L)	0.8

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

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

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

Attachment 2 – Laboratory Report(s)

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

### Detector and Deployment

Detector/Device Type:	<input checked="" type="checkbox"/> Passive	<input checked="" type="checkbox"/> Charcoal Absorption (CAD) <input type="checkbox"/> Alpha Track (ATD) <input type="checkbox"/> Other
	<input type="checkbox"/> Continuous	<input type="checkbox"/> Electret ion Chamber (EIC) <input type="checkbox"/> Electronic Integration (EID)
Other—Specify here:		
Detector/Device Name:	Air Chek – Radon Test Kits	
Manufacturer:	Radon Lab	
Person(s) Deploying or Retrieving Test Devices and certification number		Organization/Company
Shannon King		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	Length of Test (days):	3	Date of Deployment and Retrieval (mm/dd/yy):	12/09/2024
<input type="checkbox"/> Long-Term				12/12/2024
Does the test period include weekends, school breaks or holidays?				<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No
If “Yes” please explain/detail in the space below:				
Was HVAC operating under occupied conditions?				<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No
If “No” please explain/detail in the space below:				

**Testing** (continued)

Round of Testing	Detectors Deployed				
	Ground-Contact		Upper-Level(s)		Total
	Initial	Follow-Up	Initial	Follow-Up	
Test Locations <sup>1</sup>	63	0	3	0	66
Duplicates <sup>2</sup>	7	0	0	0	7
Field Blanks <sup>3</sup>	3	0	0	0	3
Grand Total					76

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

2 - 10% of all locations tested, per floor

3 – 5% of all locations tested, per floor

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

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

Round of Testing	QA/QC Samples		Total
	Initial	Follow-Up	
Spikes <sup>1</sup>	Not applicable		3
Trip Blanks <sup>2</sup>	1	0	1
Office Blanks <sup>3, 4</sup>	1	0	1
			5

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

2 – One per shipping container from start of detector deployment

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

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

## Quality Assurance / Quality Control (continued)

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

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

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

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

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

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



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

Round of Testing	Ground-Contact		Upper-Level(s)		Total
	Initial	Follow-Up	Initial	Follow-Up	
Number of test locations:	63	0	3	0	66
Number of locations $\geq 8.0$ -pCi/L:	0	0	0	0	0
Number of locations $\geq 4.0$ and $\leq 8$ -pCi/L:	0	0	0	0	0
Number of locations $\geq 2.7$ and $< 4$ -pCi/L:	0	0	0	0	0
Number of locations $\geq 2.0$ and $< 2.7$ -pCi/L:	0	0	0	0	0
Number of missing required test locations <sup>3</sup> :	0	0	0	0	0
Number of failed duplicate control locations:	0	0	0	0	0
Percentage of missing test locations for the facility <sup>4,5</sup> :	0%	0%	0%	0%	0%

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

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

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

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

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

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

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

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

## Follow-Up Testing

### Required –

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

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

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

# **Attachment 1:**

## **Summary Data Tables**

Table 1- Radon Testing Results		
Highland Elementary School		
Test Period: 12/09/2024 - 12/12/2024		
Kit Number	Room / Area	Result
11892999	1	< 0.3
11906401	2	< 0.3
11893000	3	< 0.3
11906403	4	< 0.3
11906405	5	< 0.3
11906406	6	< 0.3
11906404	7	< 0.3
11906407	7	< 0.3
11906411	7	< 0.3
11892984	8	< 0.3
11892981	9	< 0.3
11892971	10	< 0.3
11892977	11	< 0.3
11892950	12	< 0.3
11892951	13	< 0.3
11892959	13	< 0.3
11906415	22	0.5
11906416	23	0.6
11906418	23	0.7
11906413	24	0.8
11906414	25	0.5
11906419	26	0.8
11906420	27	0.5
11906423	28	< 0.3
11906410	29	< 0.3
11906412	30	< 0.3
11892952	11B WELLNESS ROOM	< 0.3
11892957	12B	0.5
11892958	13	< 0.3
11892965	13A	< 0.3
11892960	13B	< 0.3
11892966	14A	< 0.3
11892982	8A	< 0.3
11892976	9A	< 0.3
11892980	9B	< 0.3
11892979	9C	< 0.3
11892948	ALL PURPOSE ROOM	< 0.3

Table 1- Radon Testing Results		
Highland Elementary School		
Test Period: 12/09/2024 - 12/12/2024		
Kit Number	Room / Area	Result
11892947	AP PICKET	< 0.3
11892964	BUILDING SERVICES	< 0.3
11892956	CAFETERIA OFFICE	< 0.3
11892983	CHAPMAN OFFICE	< 0.3
11892954	CONFERENCE ROOM IN MAIN OFFICE	< 0.3
11892967	COUNSELOR SANTI	< 0.3
11892985	COUNSELOR THOMPSON	0.5
11892986	COUNSELOR THOMPSON	< 0.3
11892991	COUNSELOR THOMPSON	< 0.3
11892962	CSL AROCHO	< 0.3
11892963	CSL AROCHO	< 0.3
11906408	GYM	< 0.3
11906409	GYM	< 0.3
11892992	H102	< 0.3
11892988	H105	< 0.3
11892987	H107	< 0.3
11892993	H110	< 0.3
11892994	H111	< 0.3
11892989	H113	< 0.3
11892990	H117	< 0.3
11892995	H118	< 0.3
11892996	H118	< 0.3
11892997	H119	< 0.3
11892998	H120	< 0.3
11892973	INTERVENTION FLORES	< 0.3
11906402	LEE	0.6
11892940	MAIN OFFICE	< 0.3
11892969	MEDIA CENTER	< 0.3
11892970	MEDIA CENTER WORK ROOM	< 0.3
11906417	MS LEES READING INTERVENTION	< 0.3

Table 1- Radon Testing Results		
Highland Elementary School		
Test Period: 12/09/2024 - 12/12/2024		
Kit Number	Room / Area	Result
11892961	PCC	< 0.3
11892955	PRINCIPLE STEFFAN	< 0.3
11892978	SLP OFFICE	< 0.3
11892974	SPEECH MARTINEZ	< 0.3
11892975	SPEECH MARTINEZ	< 0.3
11892968	STAFF LOUNGE	< 0.3
11892972	STAFF LOUNGE	< 0.3
11892953	STAFF WORK ROOM	< 0.3
11892946	WORK ROOM IN MAIN OFFICE	< 0.3

[illegible]

Table 3 - QC Radon Testing Results			
Highland Elementary School			
Test Period: 12/09/2024 - 12/12/2024			
Kit Number	QC Type	Room / Area	Result
11906407	D	7	< 0.3
11906411	FB	7	< 0.3
11892958	D	13	< 0.3
11892959	FB	13	< 0.3
11906418	D	23	0.7
11892985	D	Counselor Thompson	0.5
11892991	FB	Counselor Thompson	< 0.3
11892962	D	CSL Arocho	< 0.3
11892996	D	H118	< 0.3
11892975	D	Speech Martinez	< 0.3
11477899	OB	OFFICE BLANK	< 0.3
11482789	TB	TRAVEL BLANK	< 0.3



Table 3a - Duplicate Worksheet / Data Validation										
Highland Elementary School										
Test Period: 12/09/2024 - 12/13/2024										
Sample ID			Duplicate Concentrations (pCi/L) and OC Checks							
Kit Numbers		Room / Area	Higher	Lower	Check #1 (Pass/Fail)	2x the Lower	Check #2 (Pass/Fail)	Average	Relative Percent Difference (RPD)	Check #3
11892963	11892962	CSL Arocho	0.3	0.3	✓	0.6	PASS	0.3	<1-pCi/L	✓
11892951	11892958	13	0.3	0.3	✓	0.6	PASS	0.3	<1-pCi/L	✓
11892974	11892975	Speech Martinez	0.3	0.3	✓	0.6	PASS	0.3	<1-pCi/L	✓
11892986	11892985	Councilor Thompson	0.5	0.3	✓	0.6	PASS	0.4	<1-pCi/L	✓
11892995	11892996	H118	0.3	0.3	✓	0.6	PASS	0.3	<1-pCi/L	✓
11906404	11906407	7	0.3	0.3	✓	0.6	PASS	0.3	<1-pCi/L	✓
11906416	11906418	23	0.7	0.6	✓	1.2	PASS	0.7	<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:

Kit #	Room Id	Started	Ended	pCi/L	Analyzed
11892999	1	2024-12-09 @ 11:00 am	2024-12-12 @ 9:00 am	< 0.3	2024-12-16
11906401	2	2024-12-09 @ 11:00 am	2024-12-12 @ 9:00 am	< 0.3	2024-12-16
11906415	22	2024-12-09 @ 11:00 am	2024-12-12 @ 10:00 am	0.5 ± 0.3	2024-12-16
11906416	23	2024-12-09 @ 11:00 am	2024-12-12 @ 10:00 am	0.6 ± 0.3	2024-12-16
11906418	23DUPLICATE	2024-12-09 @ 11:00 am	2024-12-12 @ 10:00 am	0.7 ± 0.3	2024-12-16
11906413	24	2024-12-09 @ 11:00 am	2024-12-12 @ 10:00 am	0.8 ± 0.3	2024-12-16
11906414	25	2024-12-09 @ 11:00 am	2024-12-12 @ 10:00 am	0.5 ± 0.3	2024-12-16
11906419	26	2024-12-09 @ 11:00 am	2024-12-12 @ 10:00 am	0.8 ± 0.3	2024-12-16
11906420	27	2024-12-09 @ 11:00 am	2024-12-12 @ 10:00 am	0.5 ± 0.3	2024-12-16
11906423	28	2024-12-09 @ 11:00 am	2024-12-12 @ 10:00 am	< 0.3	2024-12-16
11906410	29	2024-12-09 @ 11:00 am	2024-12-12 @ 9:00 am	< 0.3	2024-12-16
11893000	3	2024-12-09 @ 11:00 am	2024-12-12 @ 9:00 am	< 0.3	2024-12-16
11906412	30	2024-12-09 @ 11:00 am	2024-12-12 @ 10:00 am	< 0.3	2024-12-16
11906403	4	2024-12-09 @ 11:00 am	2024-12-12 @ 9:00 am	< 0.3	2024-12-16
11906405	5	2024-12-09 @ 11:00 am	2024-12-12 @ 9:00 am	< 0.3	2024-12-16
11906406	6	2024-12-09 @ 11:00 am	2024-12-12 @ 9:00 am	< 0.3	2024-12-16
11906404	7	2024-12-09 @ 11:00 am	2024-12-12 @ 9:00 am	< 0.3	2024-12-16
11906407	7 DUPLICATE	2024-12-09 @ 11:00 am	2024-12-12 @ 9:00 am	< 0.3	2024-12-16
11892984	8	2024-12-09 @ 10:00 am	2024-12-12 @ 9:00 am	< 0.3	2024-12-16
11892982	8A	2024-12-09 @ 10:00 am	2024-12-12 @ 9:00 am	< 0.3	2024-12-16
11892981	9	2024-12-09 @ 10:00 am	2024-12-12 @ 9:00 am	< 0.3	2024-12-16
11892976	9A	2024-12-09 @ 10:00 am	2024-12-12 @ 9:00 am	< 0.3	2024-12-16
11892980	9B	2024-12-09 @ 10:00 am	2024-12-12 @ 9:00 am	< 0.3	2024-12-16
11892979	9C	2024-12-09 @ 10:00 am	2024-12-12 @ 9:00 am	< 0.3	2024-12-16
11892947	AP PICKET	2024-12-09 @ 9:00 am	2024-12-12 @ 9:00 am	< 0.3	2024-12-16
11892983	CHAPMAN OFFICE	2024-12-09 @ 10:00 am	2024-12-12 @ 9:00 am	< 0.3	2024-12-16
11892967	COUNSELOR SANTI	2024-12-09 @ 10:00 am	2024-12-12 @ 9:00 am	< 0.3	2024-12-16
11892986	COUNSELOR THOMPSON	2024-12-09 @ 10:00 am	2024-12-12 @ 9:00 am	< 0.3	2024-12-16
11892985	COUNSELOR THOMPSON DUPLICATE	2024-12-09 @ 10:00 am	2024-12-12 @ 9:00 am	0.5 ± 0.3	2024-12-16
11906411	FIELD BLANK	2024-12-09 @ 11:00 am	2024-12-12 @ 10:00 am	< 0.3	2024-12-16
11892991	FIELD BLANK	2024-12-09 @ 10:00 am	2024-12-12 @ 10:00 am	< 0.3	2024-12-16
11906409	GYM	2024-12-09 @ 11:00 am	2024-12-12 @ 9:00 am	< 0.3	2024-12-16
11906408	GYM	2024-12-09 @ 11:00 am	2024-12-12 @ 10:00 am	< 0.3	2024-12-16
11892992	H102	2024-12-09 @ 10:00 am	2024-12-12 @ 9:00 am	< 0.3	2024-12-16
11892988	H105 NURSES OFFICE	2024-12-09 @ 10:00 am	2024-12-12 @ 9:00 am	< 0.3	2024-12-16
11892987	H107	2024-12-09 @ 10:00 am	2024-12-12 @ 9:00 am	< 0.3	2024-12-16
11892993	H110	2024-12-09 @ 10:00 am	2024-12-12 @ 9:00 am	< 0.3	2024-12-16

December 16, 2024

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

Radon test result report for:

Kit #	Room Id	Started	Ended	pCi/L	Analyzed
11892994	H111	2024-12-09 @ 10:00 am	2024-12-12 @ 9:00 am	< 0.3	2024-12-16
11892989	H113	2024-12-09 @ 10:00 am	2024-12-12 @ 9:00 am	< 0.3	2024-12-16
11892990	H117	2024-12-09 @ 10:00 am	2024-12-12 @ 9:00 am	< 0.3	2024-12-16
11892995	H118	2024-12-09 @ 10:00 am	2024-12-12 @ 9:00 am	< 0.3	2024-12-16
11892996	H118 DUPLICATE	2024-12-09 @ 10:00 am	2024-12-12 @ 9:00 am	< 0.3	2024-12-16
11892997	H119	2024-12-09 @ 10:00 am	2024-12-12 @ 9:00 am	< 0.3	2024-12-16
11892998	H120	2024-12-09 @ 10:00 am	2024-12-12 @ 9:00 am	< 0.3	2024-12-16
11892973	INTERVENTION FLORES	2024-12-09 @ 10:00 am	2024-12-12 @ 9:00 am	< 0.3	2024-12-16
11906402	LEE	2024-12-09 @ 11:00 am	2024-12-12 @ 9:00 am	0.6 ± 0.3	2024-12-16
11892940	MAIN OFFICE	2024-12-09 @ 9:00 am	2024-12-12 @ 8:00 am	< 0.3	2024-12-16
11906417	MS LEES READING INTERVENTION	2024-12-09 @ 11:00 am	2024-12-12 @ 10:00 am	< 0.3	2024-12-16
11892978	SLP OFFICE	2024-12-09 @ 10:00 am	2024-12-12 @ 9:00 am	< 0.3	2024-12-16
11892974	SPEECH MARTINEZ	2024-12-09 @ 10:00 am	2024-12-12 @ 9:00 am	< 0.3	2024-12-16
11892975	SPEECH MARTINEZ DUPLICATE	2024-12-09 @ 10:00 am	2024-12-12 @ 9:00 am	< 0.3	2024-12-16
11892972	STAFF LOUNGE	2024-12-09 @ 10:00 am	2024-12-12 @ 9:00 am	< 0.3	2024-12-16
11892968	STAFF LOUNGE	2024-12-09 @ 10:00 am	2024-12-12 @ 9:00 am	< 0.3	2024-12-16
11892946	WORK ROOM IN MAIN OFFICE	2024-12-09 @ 9:00 am	2024-12-12 @ 9:00 am	< 0.3	2024-12-16

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

December 16, 2024

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

Radon test result report for:  
**HIGHLAND ES**

Kit #	Room Id	Started	Ended	pCi/L	Analyzed
11892971	10	2024-12-09 @ 9:00 am	2024-12-12 @ 9:00 am	< 0.3	2024-12-16
11892977	11	2024-12-09 @ 9:00 am	2024-12-12 @ 9:00 am	< 0.3	2024-12-16
11892952	11B WELLNESS ROOM	2024-12-09 @ 9:00 am	2024-12-12 @ 9:00 am	< 0.3	2024-12-16
11892950	12	2024-12-09 @ 9:00 am	2024-12-12 @ 9:00 am	< 0.3	2024-12-16
11892957	12B	2024-12-09 @ 9:00 am	2024-12-12 @ 9:00 am	0.5 ± 0.3	2024-12-16
11892951	13	2024-12-09 @ 9:00 am	2024-12-12 @ 9:00 am	< 0.3	2024-12-16
11892958	13 DUPLICATE	2024-12-09 @ 9:00 am	2024-12-12 @ 9:00 am	< 0.3	2024-12-16
11892965	13A	2024-12-09 @ 10:00 am	2024-12-12 @ 9:00 am	< 0.3	2024-12-16
11892960	13B	2024-12-09 @ 10:00 am	2024-12-12 @ 9:00 am	< 0.3	2024-12-16
11892966	14A	2024-12-09 @ 10:00 am	2024-12-12 @ 9:00 am	< 0.3	2024-12-16
11892948	ALL PURPOSE ROOM	2024-12-09 @ 9:00 am	2024-12-12 @ 9:00 am	< 0.3	2024-12-16
11892964	BUILDING SERVICES	2024-12-09 @ 9:00 am	2024-12-12 @ 9:00 am	< 0.3	2024-12-16
11892956	CAFETERIA OFFICE	2024-12-09 @ 9:00 am	2024-12-12 @ 9:00 am	< 0.3	2024-12-16
11892954	CONFERENCE ROOM IN MAIN OFFICE	2024-12-09 @ 9:00 am	2024-12-12 @ 9:00 am	< 0.3	2024-12-16
11892963	CSL AROCHO	2024-12-09 @ 9:00 am	2024-12-12 @ 9:00 am	< 0.3	2024-12-16
11892962	CSL AROCHO	2024-12-09 @ 9:00 am	2024-12-12 @ 9:00 am	< 0.3	2024-12-16
11892959	FIELD BLANK	2024-12-09 @ 9:00 am	2024-12-12 @ 10:00 am	< 0.3	2024-12-16
11892969	MEDIA CENTER	2024-12-09 @ 9:00 am	2024-12-12 @ 9:00 am	< 0.3	2024-12-16
11892970	MEDIA CENTER WORK ROOM	2024-12-09 @ 9:00 am	2024-12-12 @ 9:00 am	< 0.3	2024-12-16
11892961	PCC	2024-12-09 @ 9:00 am	2024-12-12 @ 9:00 am	< 0.3	2024-12-16
11892955	PRINCIPLE STEFFAN	2024-12-09 @ 9:00 am	2024-12-12 @ 9:00 am	< 0.3	2024-12-16
11892953	STAFF WORK ROOM	2024-12-09 @ 9:00 am	2024-12-12 @ 9:00 am	< 0.3	2024-12-16

December 16, 2024

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

Radon test result report for:

**OFFICE  
MAIN**

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

December 16, 2024

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

Radon test result report for:

**TRAVEL  
MAIN**

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



# EXPOSURE IN BOWSER-MORNER RADON CHAMBER

CLIENT KCI TECHNOLOGIES, INC Job Number 20001560

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

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

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

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

11477880, 11477883, 11477896 \_\_\_\_\_

B4 Right

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

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

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

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

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

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

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

December 23, 2024

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

Radon test result report for:

**SK  
MAIN**

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



---

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 – Testing December 9<sup>th</sup> – December 12<sup>th</sup>, 2024

Name of Schools:

1. Georgian Forest ES
2. Glen Haven ES
3. Glenallen ES
4. Greencastle ES
5. Highland ES

---

	Date	Initials
Radon Test Kits Deployed	12/09/2024	BMM
Radon Test Kits Collected	12/12/2024	BMM
Radon Test Kits Shipped to Lab*	12/12/2024	BMM
Radon Test Kits Received by Lab*	12/16/2024	BMM

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



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

Site Name	Highland 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	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: 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: Highland Elementary School  
3100 Medway St.  
Silver Spring, MD 20902

Dear Mr. Croyle:

KCI Technologies, Inc. (KCI) is pleased to submit the following report to Montgomery County Public Schools (MCPS) pursuant to completing a “short-term” 3 day radon test for the Highland Elementary School, located at 3100 Medway St. Silver Spring, MD 20902 (subject site).

**Scope of Services:**

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

KCI visited the site on March 29, 2022 and deployed three (3) activated charcoal (AC) radon test kits. KCI deployed radon test kits in all frequently-occupied ground contact rooms, and other areas, (if applicable) in accordance with AARST guidance.

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

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

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

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

KCI returned to the site on April 01, 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		
Highland ES RT		
Test Period: 03/29/2022 - 04/01/2022		
Kit Number	Room / Area	Result
11140014	11	< 0.3
11140027	11	< 0.3
11140028	11	< 0.3

Table 2- Radon Testing Results			
Highland ES RT			
Test Period: 03/29/2022 - 04/01/2022			
Kit Number	QC Type	Room / Area	Result
11140027	D	11	< 0.3
11140014	FB	11	< 0.3
11139883	OB	OFFICE BLANK	< 0.3
11139841	TB	TRAVEL BLANK	< 0.3



## ATTACHMENT C

### Laboratory Analytical Results

---

April 4, 2022

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

---

Radon test result report for:  
**HIGHLAND ES**

---

Kit #	Room Id	Started	Ended	pCi/L	Analyzed
11140014	11	2022-03-29 @ 10:00 am	2022-04-01 @ 10:00 am	< 0.3	2022-04-04
11140027	11	2022-03-29 @ 10:00 am	2022-04-01 @ 10:00 am	< 0.3	2022-04-04
11140028	11	2022-03-29 @ 10:00 am	2022-04-01 @ 10:00 am	< 0.3	2022-04-04

---

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

# EXPOSURE IN BOWSER-MORNER RADON CHAMBER

CLIENT KCI Technologies, Inc. Job Number 204620

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

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

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

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

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

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

E3 Right

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

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

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

\_\_\_\_\_

\_\_\_\_\_

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

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

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

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

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



---

March 30, 2022

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

---

Radon test result report for:

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

---

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

---

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



---

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 – March 2022 Schools – Retesting

Name of Schools:

1. Watkins Mill HS
2. Cresthaven ES
3. East Silver Spring ES
4. Fairland Center
5. Francis Scott Key MS
6. Greencastle ES
7. Roscoe Nix ES
8. West Farm Transportation Depot
9. Wheaton HS
10. White Oak MS
11. William Tyler Page ES
12. Bel Pre ES
13. Fairland ES
14. Highland ES
15. Rolling Terrace ES
16. Takoma Park MS
17. Viers Mill ES
18. Poolesville ES

---

	Date	Initials
Radon Test Kits Deployed	03/29/2022	BMM
Radon Test Kits Collected	04/01/2022	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	Highland Elementary School
Date of Test Report	5/11/2022
Round of Testing	Initial Follow-up Post Remediation 2 Year Testing 5 Year Testing HVAC Upgrade Window Replacement New Addition New Facility
# Rooms Tested	80
# Rooms $\geq 4.0$ pCi/L	0
Lowest Value	<0.3 pCi/L
Highest Value	1.5 pCi/L

**Project Status:**

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



May 11, 2022

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

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

Location: Highland Elementary School  
3100 Medway St.  
Silver Spring, MD 20902

Dear Mr. Croyle:

KCI Technologies, Inc. (KCI) is pleased to submit the following report to Montgomery County Public Schools (MCPS) pursuant to completing a “short-term” 3 day radon test for the Highland Elementary School, located at 3100 Medway St. Silver Spring, MD 20902 (subject site).

**Scope of Services:**

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

KCI visited the site on March 14, 2022 and deployed ninety-two (92) activated charcoal (AC) radon test kits. KCI deployed radon test kits in all frequently-occupied ground contact rooms, and other areas, (if applicable) in accordance with AARST guidance.

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

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

KCI returned to the site on March 17, 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 low 20s and high temperatures ranged from the mid 70s to the high 50s Fahrenheit. Maximum sustained winds ranged from 0-32 miles per hour. Average humidity was around 61% with 0.1 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		
Highland ES		
Test Period: 03/14/2022 - 03/17/2022		
Kit Number	Room / Area	Result
11132945	1	< 0.3
11132942	2	< 0.3
11132949	3	< 0.3
11132939	4	< 0.3
11132943	5	< 0.3
11132940	6	< 0.3
11132944	7	0.7
11132950	8	< 0.3
11132968	8	< 0.3
11132948	9	< 0.3
11133000	10	< 0.3
11132999	11	NA
11132997	12	< 0.3
11132996	13	< 0.3
11139633	13	< 0.3
11139634	13	< 0.3
11139637	14	< 0.3
11139627	15	< 0.3
11139628	16	< 0.3
11139622	17	< 0.3
11139623	17	< 0.3
11139629	18	< 0.3
11139624	19	< 0.3
11139625	20	< 0.3
11139626	21	< 0.3
11139618	22	< 0.3
11139615	23	< 0.3
11139617	24	< 0.3
11139620	24	< 0.3
11139621	24	< 0.3
11139610	25	< 0.3
11139609	26	< 0.3
11139619	27	< 0.3
11139616	28	< 0.3
11139613	29	< 0.3
11139614	30	< 0.3
11132998	11A	< 0.3
11132995	12A	< 0.3
11139638	13A	< 0.3
11139630	13B	< 0.3
11139632	14A	< 0.3
11132962	8A	< 0.3

Table 1- Radon Testing Results		
Highland ES		
Test Period: 03/14/2022 - 03/17/2022		
Kit Number	Room / Area	Result
11132954	8B	0.6
11132951	8C	< 0.3
11132953	9A	< 0.3
11132966	9B	< 0.3
11132946	9C	< 0.3
11132988	ALL PURPOSE ROOM	< 0.3
11132990	ALL PURPOSE ROOM	< 0.3
11139605	ART	< 0.3
11132971	ASST PRINCIPAL OFFICE	< 0.3
11132957	BLDG SERVICES	< 0.3
11132959	COUNSELOR O5	< 0.3
11139602	GYM	< 0.3
11139611	GYM	< 0.3
11139601	GYM OFFICE	< 0.3
11132978	H 104	< 0.3
11132980	H107	< 0.3
11132981	H109	0.9
11132986	H110	0.8
11132985	H111	1.5
11132984	H113	0.8
11132982	H117	< 0.3
11132983	H117	1.2
11132987	H117	1.1
11132977	H118	0.7
11132979	H119	1.0
11132976	H120	0.7
11132975	H123	< 0.3
11132989	KITCHEN OFFICE	< 0.3
11132991	KITCHEN OFFICE	< 0.3
11132947	LOWER OFFICE	< 0.3
11132969	MAIN OFFICE	< 0.3
11132970	MAIN OFFICE	< 0.3
11132972	MAIN OFFICE WORK ROOM	< 0.3
11132963	MATH	< 0.3
11132994	MEDIA CENTER	< 0.3
11132992	MEDIA CENTER WORK ROOM	< 0.3
11132993	MEDIA STORAGE/OFFICE	< 0.3
11139631	MUSIC ROOM	< 0.3
11132974	OFFICE CONFERENCE ROOM	< 0.3
11132973	PPR AROCHO	< 0.3
11132958	PPR FISHMAN	< 0.3
11132960	PRINCIPAL OFFICE	< 0.3

Table 1- Radon Testing Results		
Highland ES		
Test Period: 03/14/2022 - 03/17/2022		
Kit Number	Room / Area	Result
11139603	READING ROOM	< 0.3
11139604	READING ROOM	< 0.3
11132955	SD	< 0.3
11132964	SOAR	< 0.3
11132956	STAFF LOUNGE	< 0.3
11132961	STAFF LOUNGE	< 0.3
11132967	STAFF LOUNGE	< 0.3
11132952	STAFF WORK ROOM	< 0.3

Table 2- Radon Testing Results			
Highland ES			
Test Period: 03/14/2022 - 03/17/2022			
Kit Number	QC Type	Room / Area	Result
11132968	D	8	< 0.3
11132961	D	Staff Lounge	< 0.3
11132956	FB	Staff Lounge	< 0.3
11132970	D	Main Office	< 0.3
11132987	D	H117	1.1
11132982	FB	H117	< 0.3
11139633	D	13	< 0.3
11132996	FB	13	< 0.3
11139622	D	17	< 0.3
11139621	D	24	< 0.3
11139620	FB	24	< 0.3
11139604	D	Reading Room	< 0.3
11138932	OB	OFFICE BLANK	< 0.3
11138946	TB	TRAVEL BLANK	< 0.3



## ATTACHMENT C

### Laboratory Analytical Results

Radon test result report for:

Kit #	Room Id	Started	Ended	pCi/L	Analyzed
11132945	1	2022-03-14 @ 9:00 am	2022-03-17 @ 10:00 am	< 0.3	2022-03-21
11133000	10	2022-03-14 @ 11:00 am	2022-03-17 @ 10:00 am	< 0.3	2022-03-21
11132999	11	2022-03-14 @ 11:00 am	2022-03-17 @ 11:00 am	???? IF1	2022-03-21
11132998	11A	2022-03-14 @ 11:00 am	2022-03-17 @ 11:00 am	< 0.3	2022-03-21
11132997	12	2022-03-14 @ 11:00 am	2022-03-17 @ 11:00 am	< 0.3	2022-03-21
11132995	12A	2022-03-14 @ 11:00 am	2022-03-17 @ 11:00 am	< 0.3	2022-03-21
11132996	13	2022-03-14 @ 11:00 am	2022-03-17 @ 11:00 am	< 0.3	2022-03-21
11139634	13	2022-03-14 @ 11:00 am	2022-03-17 @ 11:00 am	< 0.3	2022-03-21
11139633	13	2022-03-14 @ 11:00 am	2022-03-17 @ 11:00 am	< 0.3	2022-03-21
11139638	13A	2022-03-14 @ 11:00 am	2022-03-17 @ 11:00 am	< 0.3	2022-03-21
11139630	13B	2022-03-14 @ 12:00 pm	2022-03-17 @ 11:00 am	< 0.3	2022-03-21
11139637	14	2022-03-14 @ 11:00 am	2022-03-17 @ 11:00 am	< 0.3	2022-03-21
11139632	14A	2022-03-14 @ 12:00 pm	2022-03-17 @ 11:00 am	< 0.3	2022-03-21
11139627	15	2022-03-14 @ 12:00 pm	2022-03-17 @ 11:00 am	< 0.3	2022-03-21
11139628	16	2022-03-14 @ 12:00 pm	2022-03-17 @ 11:00 am	< 0.3	2022-03-21
11139622	17	2022-03-14 @ 12:00 pm	2022-03-17 @ 11:00 am	< 0.3	2022-03-21
11139623	17	2022-03-14 @ 12:00 pm	2022-03-17 @ 11:00 am	< 0.3	2022-03-21
11139629	18	2022-03-14 @ 12:00 pm	2022-03-17 @ 11:00 am	< 0.3	2022-03-21
11139624	19	2022-03-14 @ 12:00 pm	2022-03-17 @ 11:00 am	< 0.3	2022-03-21
11132942	2	2022-03-14 @ 9:00 am	2022-03-17 @ 10:00 am	< 0.3	2022-03-21
11139625	20	2022-03-14 @ 12:00 pm	2022-03-17 @ 11:00 am	< 0.3	2022-03-21
11139626	21	2022-03-14 @ 12:00 pm	2022-03-17 @ 11:00 am	< 0.3	2022-03-21
11139618	22	2022-03-14 @ 12:00 pm	2022-03-17 @ 11:00 am	< 0.3	2022-03-21
11139615	23	2022-03-14 @ 12:00 pm	2022-03-17 @ 11:00 am	< 0.3	2022-03-21
11139621	24	2022-03-14 @ 12:00 pm	2022-03-17 @ 11:00 am	< 0.3	2022-03-21
11139620	24	2022-03-14 @ 12:00 pm	2022-03-17 @ 11:00 am	< 0.3	2022-03-21
11139617	24	2022-03-14 @ 12:00 pm	2022-03-17 @ 11:00 am	< 0.3	2022-03-21
11139610	25	2022-03-14 @ 12:00 pm	2022-03-17 @ 11:00 am	< 0.3	2022-03-21
11139609	26	2022-03-14 @ 12:00 pm	2022-03-17 @ 11:00 am	< 0.3	2022-03-21
11139619	27	2022-03-14 @ 12:00 pm	2022-03-17 @ 11:00 am	< 0.3	2022-03-21
11139616	28	2022-03-14 @ 12:00 pm	2022-03-17 @ 11:00 am	< 0.3	2022-03-21
11139613	29	2022-03-14 @ 12:00 pm	2022-03-17 @ 11:00 am	< 0.3	2022-03-21
11132949	3	2022-03-14 @ 9:00 am	2022-03-17 @ 10:00 am	< 0.3	2022-03-21
11139614	30	2022-03-14 @ 12:00 pm	2022-03-17 @ 11:00 am	< 0.3	2022-03-21
11132939	4	2022-03-14 @ 9:00 am	2022-03-17 @ 10:00 am	< 0.3	2022-03-21
11132943	5	2022-03-14 @ 9:00 am	2022-03-17 @ 10:00 am	< 0.3	2022-03-21
11132940	6	2022-03-14 @ 9:00 am	2022-03-17 @ 10:00 am	< 0.3	2022-03-21



Radon test result report for:

Kit #	Room Id	Started	Ended	pCi/L	Analyzed
11132944	7	2022-03-14 @ 9:00 am	2022-03-17 @ 10:00 am	0.7 ± 0.3	2022-03-21
11132968	8	2022-03-14 @ 9:00 am	2022-03-17 @ 10:00 am	< 0.3	2022-03-21
11132950	8	2022-03-14 @ 9:00 am	2022-03-17 @ 10:00 am	< 0.3	2022-03-21
11132962	8A	2022-03-14 @ 9:00 am	2022-03-17 @ 10:00 am	< 0.3	2022-03-21
11132954	8B	2022-03-14 @ 9:00 am	2022-03-17 @ 10:00 am	0.6 ± 0.3	2022-03-21
11132951	8C	2022-03-14 @ 9:00 am	2022-03-17 @ 10:00 am	< 0.3	2022-03-21
11132948	9	2022-03-14 @ 9:00 am	2022-03-17 @ 10:00 am	< 0.3	2022-03-21
11132953	9A	2022-03-14 @ 9:00 am	2022-03-17 @ 10:00 am	< 0.3	2022-03-21
11132966	9B	2022-03-14 @ 9:00 am	2022-03-17 @ 10:00 am	< 0.3	2022-03-21
11132946	9C	2022-03-14 @ 9:00 am	2022-03-17 @ 10:00 am	< 0.3	2022-03-21
11132988	ALL PURPOSE ROOM	2022-03-14 @ 11:00 am	2022-03-17 @ 10:00 am	< 0.3	2022-03-21
11132990	ALL PURPOSE ROOM	2022-03-14 @ 11:00 am	2022-03-17 @ 10:00 am	< 0.3	2022-03-21
11139605	ART	2022-03-14 @ 1:00 pm	2022-03-17 @ 11:00 am	< 0.3	2022-03-21
11132971	ASST PRINCIPAL OFFICE	2022-03-14 @ 10:00 am	2022-03-17 @ 10:00 am	< 0.3	2022-03-21
11132957	BLDG SERVICES	2022-03-14 @ 10:00 am	2022-03-17 @ 9:00 am	< 0.3	2022-03-21
11132959	COUNSELOR O5	2022-03-14 @ 9:00 am	2022-03-17 @ 10:00 am	< 0.3	2022-03-21
11139611	GYM	2022-03-14 @ 12:00 pm	2022-03-17 @ 11:00 am	< 0.3	2022-03-21
11139602	GYM	2022-03-14 @ 12:00 pm	2022-03-17 @ 11:00 am	< 0.3	2022-03-21
11139601	GYM OFFICE	2022-03-14 @ 12:00 pm	2022-03-17 @ 11:00 am	< 0.3	2022-03-21
11132978	H 104	2022-03-14 @ 10:00 am	2022-03-17 @ 10:00 am	< 0.3	2022-03-21
11132980	H107	2022-03-14 @ 10:00 am	2022-03-17 @ 10:00 am	< 0.3	2022-03-21
11132981	H109	2022-03-14 @ 10:00 am	2022-03-17 @ 10:00 am	0.9 ± 0.3	2022-03-21
11132986	H110	2022-03-14 @ 11:00 am	2022-03-17 @ 10:00 am	0.8 ± 0.3	2022-03-21
11132985	H111	2022-03-14 @ 11:00 am	2022-03-17 @ 10:00 am	1.5 ± 0.4	2022-03-21
11132984	H113	2022-03-14 @ 11:00 am	2022-03-17 @ 10:00 am	0.8 ± 0.3	2022-03-21
11132983	H117	2022-03-14 @ 10:00 am	2022-03-17 @ 10:00 am	1.2 ± 0.3	2022-03-21
11132982	H117	2022-03-14 @ 10:00 am	2022-03-17 @ 10:00 am	< 0.3	2022-03-21
11132987	H117	2022-03-14 @ 10:00 am	2022-03-17 @ 10:00 am	1.1 ± 0.3	2022-03-21
11132977	H118	2022-03-14 @ 11:00 am	2022-03-17 @ 10:00 am	0.7 ± 0.3	2022-03-21
11132979	H119	2022-03-14 @ 10:00 am	2022-03-17 @ 11:00 am	1.0 ± 0.3	2022-03-21
11132976	H120	2022-03-14 @ 10:00 am	2022-03-17 @ 10:00 am	0.7 ± 0.3	2022-03-21
11132975	H123	2022-03-14 @ 10:00 am	2022-03-17 @ 10:00 am	< 0.3	2022-03-21
11132989	KITCHEN OFFICE	2022-03-14 @ 11:00 am	2022-03-17 @ 10:00 am	< 0.3	2022-03-21
11132991	KITCHEN OFFICE	2022-03-14 @ 11:00 am	2022-03-17 @ 10:00 am	< 0.3	2022-03-21
11132947	LOWER OFFICE	2022-03-14 @ 9:00 am	2022-03-17 @ 10:00 am	< 0.3	2022-03-21
11132970	MAIN OFFICE	2022-03-14 @ 10:00 am	2022-03-17 @ 10:00 am	< 0.3	2022-03-21
11132969	MAIN OFFICE	2022-03-14 @ 10:00 am	2022-03-17 @ 10:00 am	< 0.3	2022-03-21

March 22, 2022

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

Radon test result report for:

Kit #	Room Id	Started	Ended	pCi/L	Analyzed
11132972	MAIN OFFICE WORK ROOM	2022-03-14 @ 10:00 am	2022-03-17 @ 10:00 am	< 0.3	2022-03-21
11132963	MATH	2022-03-14 @ 10:00 am	2022-03-17 @ 10:00 am	< 0.3	2022-03-21
11132994	MEDIA CENTER	2022-03-14 @ 11:00 am	2022-03-17 @ 11:00 am	< 0.3	2022-03-21
11132992	MEDIA CENTER WORK ROOM	2022-03-14 @ 11:00 am	2022-03-17 @ 11:00 am	< 0.3	2022-03-21
11132993	MEDIA STORAGE/OFFICE	2022-03-14 @ 11:00 am	2022-03-17 @ 11:00 am	< 0.3	2022-03-21
11139631	MUSIC ROOM	2022-03-14 @ 12:00 pm	2022-03-17 @ 11:00 am	< 0.3	2022-03-21
11132974	OFFICE CONFERENCE ROOM	2022-03-14 @ 10:00 am	2022-03-17 @ 11:00 am	< 0.3	2022-03-21
11132973	PPR AROCHO	2022-03-14 @ 10:00 am	2022-03-17 @ 10:00 am	< 0.3	2022-03-21
11132958	PPR FISHMAN	2022-03-14 @ 10:00 am	2022-03-17 @ 10:00 am	< 0.3	2022-03-21
11132960	PRINCIPAL OFFICE	2022-03-14 @ 10:00 am	2022-03-17 @ 10:00 am	< 0.3	2022-03-21
11139603	READING ROOM	2022-03-14 @ 1:00 pm	2022-03-17 @ 11:00 am	< 0.3	2022-03-21
11139604	READING ROOM	2022-03-14 @ 1:00 pm	2022-03-17 @ 11:00 am	< 0.3	2022-03-21
11132955	SD	2022-03-14 @ 10:00 am	2022-03-17 @ 10:00 am	< 0.3	2022-03-21
11132964	SOAR	2022-03-14 @ 10:00 am	2022-03-17 @ 10:00 am	< 0.3	2022-03-21
11132961	STAFF LOUNGE	2022-03-14 @ 10:00 am	2022-03-17 @ 10:00 am	< 0.3	2022-03-21
11132956	STAFF LOUNGE	2022-03-14 @ 10:00 am	2022-03-17 @ 10:00 am	< 0.3	2022-03-21
11132967	STAFF LOUNGE	2022-03-14 @ 10:00 am	2022-03-17 @ 10:00 am	< 0.3	2022-03-21
11132952	STAFF WORK ROOM	2022-03-14 @ 9:00 am	2022-03-17 @ 10:00 am	< 0.3	2022-03-21

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

# EXPOSURE IN BOWSER-MORNER RADON CHAMBER

CLIENT KCI Technologies, Inc. Job Number 204620

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

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

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

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

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

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

E3 Right

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

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

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

\_\_\_\_\_

\_\_\_\_\_

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

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

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

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

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

---

March 30, 2022

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

---

Radon test result report for:

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

---

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

---

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



---

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 – March 2022 Schools

Name of Schools:

1. Silver Spring International MS
2. Sligo Creek ES
3. Takoma Park MS
4. Takoma Park ES
5. Highland ES
6. Rolling Terrace ES

---

	Date	Initials
Radon Test Kits Deployed	03/14/2022	BMM
Radon Test Kits Collected	03/17/2022	BMM
Radon Test Kits Shipped to Lab*	03/17/2022	BMM
Radon Test Kits Received by Lab*	03/20/2022	BMM

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

# RADON SCREENING SURVEY – FOLLOW-UP HIGHLAND ELEMENTARY SCHOOL

3100 Medway Street,

Silver Spring, Maryland 20902

## EXECUTIVE SUMMARY

Date of Test Report:	3/15/19
Round of Testing:	Initial Follow-up Post Remediation
# Rooms Tested	2
# Rooms $\geq$ 4.0 pCi/L:	0
Low Value:	2.0
High Value:	2.1
Confirmed Rooms $\geq$ 4.0 pCi/L US EPA Action Level	0

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

Room	Result (pCi/L) 2/13/19	Result (pCi/L) 3/15/19	Average Result (pCi/L)
24	4.9	2.1	3.5
26	4.4	2.0	3.2



## MONTGOMERY COUNTY PUBLIC SCHOOLS RADON TESTING

### Executive Summary: Highland Elementary School

3100 Medway Street  
Silver Spring, MD 20902

Date of Test Report:	3/15/2019
Round of Testing:	Initial <b>Follow-up</b> Post Remediation 2 Year Testing 5 Year Testing HVAC Upgrade Window Replacement New Addition New Facility
# of Rooms Tested:	2
# of Rooms $\geq$ 4.0 pCi/L:	0
Low Value:	2.0
High Value:	2.1

### Project Status

**Retesting completed:** No further action at this time.



March 15, 2019

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

Re: Radon Testing Services

Location: Highland Elementary School  
3100 Medway Street  
Silver Spring, MD 20902

Dear Mr. Cox:

Intertek-PSI (PSI) is pleased to submit the following report to the Montgomery County Public Schools (MCPS) for completion of a "short-term" 3-day radon test for Highland Elementary School, located at 3100 Medway Street, Silver Spring, MD 20902 (subject site).

#### **Scope of Services:**

PSI conducted radon testing at the subject site to evaluate indoor radon levels relative to the USEPA's recommended action level of 4.0 picocuries per Liter (pCi/L) - the level at which EPA recommends that schools take action to reduce the level. PSI conducted the radon testing in accordance with American Association of Radon Scientists and Technologists (AARST) Protocol for Conducting Measurements of Radon and Radon Decay Products in Schools and Large Buildings. A National Radon Safety Board (NRSB) Radon Measurement Specialist (certification #14SS007) supervised the testing. Additional information on radon management and the health effects of radon exposure is available from [www.montgomerycountymd.gov/dep/air/radon](http://www.montgomerycountymd.gov/dep/air/radon) or [www.epa.gov/radon](http://www.epa.gov/radon).

PSI visited the site on February 25, 2019 and deployed two (2) activated charcoal (AC) radon test kit. PSI deployed radon test kits in frequently-occupied ground contact rooms, and other areas, (if applicable) in accordance with AARST guidance. PSI returned to the site on February 28, 2019 to retrieve the radon sampling test kit. A floor plan map of the building with the test location is included as Attachment A of this report.

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

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

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

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





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

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

### **Results:**

The results of the radon test analysis indicated the following:

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

Notes:

D -Duplicate Sample

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

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

Laboratory results and exposure data for the spike samples are also included in Attachment C. Our professional services have been performed in accordance with customary principles and practices in the field of industrial hygiene and engineering. If you have any questions or comments regarding this report, please feel free to contact me at (703) 698-9300.

Respectfully Submitted,

**INTERTEK - PSI**

A handwritten signature in black ink, appearing to read "Nand Kaushik". The signature is fluid and cursive, with the first name "Nand" and last name "Kaushik" clearly distinguishable.

Nand Kaushik, P.E.

Department Manager, Environmental Services

[Nand.Kaushik@intertek.com](mailto:Nand.Kaushik@intertek.com)

Attachments:

A – Floor Plan with Test Locations

B – Table 1 – Radon Test Summary Spreadsheet

C – Laboratory Analytical Results

## **ATTACHMENT B**

Radon Test Summary Spreadsheet

Radon Testing Results		
Highland Elementary School		
Testing period: 2/25/19 - 2/28/19		
Kit Number	Room / Area	Result (pCi/L)
3923408	24	2.1
3923409	26	2.0

**Table Notes:**

D – Duplicate

FB – Field Blank

OB – Office Blank

TB – Transit Blank

QC – Quality Control

# **ATTACHMENT C**

Laboratory Analytical Results

NRPP 105011 AL  
NRSB ARL0007

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

Laboratory Report for:

Property Tested: Project # 04481387-1

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

MCPS Radon Survey Highland ES  
3100 Medway Street  
Wheaton MD 20902

Log Number	Device Number	Test Exposure Duration:	Area Tested	Result pCi/L
3220606	3923408	02/25/2019 4:00 pm 02/28/2019 3:54 pm	Floor lower level Room 24	2.1
3220607	3923409	02/25/2019 4:04 pm 02/28/2019 3:56 pm	Floor Lower Level Room 26	2.0

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

Distributed by: Intertek-PSI (VA)

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

Report Reviewed By: 

Report Approved By: 

**Disclaimer:**

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

Shawn Price, Director of Laboratory Operations, AccuStar Labs

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



## MONTGOMERY COUNTY PUBLIC SCHOOLS RADON TESTING

### Executive Summary: Highland Elementary School

3100 Medway Street  
Silver Spring, MD 20902

Date of Test Report:	2/13/2019
Round of Testing:	Initial Follow-up <b>Post Remediation</b> 2 Year Testing 5 Year Testing HVAC Upgrade Window Replacement New Addition New Facility
# of Rooms Tested:	77
# of Rooms $\geq 4.0$ pCi/L:	2
Low Value:	< 0.4
High Value:	4.9
Rooms with Results	24
$\geq 4.0$ pCi/L:	26

### Project Status

**Initial testing complete:** Re-test needed for results  $\geq 4.0$  pCi/L





February 13, 2019

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

Re: Radon Testing Services

Location: Highland Elementary School  
3100 Medway Street  
Silver Spring, MD 20902

Dear Mr. Cox:

Intertek-PSI (PSI) is pleased to submit the following report to the Montgomery County Public Schools (MCPS) for completion of a "short-term" 3-day radon test for Highland Elementary School, located at 3100 Medway Street, Silver Spring, MD 20902 (subject site).

**Scope of Services:**

PSI conducted radon testing at the subject site to evaluate indoor radon levels relative to the USEPA's recommended action level of 4.0 picocuries per Liter (pCi/L) - the level at which EPA recommends that schools take action to reduce the level. PSI conducted the radon testing in accordance with American Association of Radon Scientists and Technologists (AARST) Protocol for Conducting Measurements of Radon and Radon Decay Products in Schools and Large Buildings. A National Radon Safety Board (NRSB) Radon Measurement Specialist (certification #14SS007) supervised the testing. Additional information on radon management and the health effects of radon exposure is available from [www.montgomerycountymd.gov/dep/air/radon](http://www.montgomerycountymd.gov/dep/air/radon) or [www.epa.gov/radon](http://www.epa.gov/radon).

PSI visited the site on November 13, 2018 and deployed ninety-four (94) activated charcoal (AC) radon test kits. PSI deployed radon test kits in frequently-occupied ground contact rooms, and other areas, (if applicable) in accordance with AARST guidance. A floor plan map of the building with the test locations is included as Attachment A of this report.

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

PSI returned to the site on November 16, 2018 to retrieve the radon sampling test kits. PSI shipped all radon tests via overnight delivery to AccuStar Labs for analysis by gamma-ray spectroscopy. Accustar Labs is a NRSB certified analytical laboratory for radon analysis located at 929 Mount Zion Road, Lebanon, Pennsylvania (certification # ARL0007) and 2 Saber Way, Haverhill, Massachusetts (certification # ARL0017).



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

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

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

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

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

### **Results:**

The results of the radon test analysis indicated the following:

Radon Concentration	Room	Result
$\geq 4.0$ pCi/L	24	4.9
	26	4.4
$\leq 4.0$ pCi/L	See Attachment B	

Notes:  
D -Duplicate Sample

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

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

Laboratory results and exposure data for the spike samples are also included in Attachment C. Our professional services have been performed in accordance with customary principles and practices in the field of industrial hygiene and engineering. If you have any questions or comments regarding this report, please feel free to contact me at (703) 698-9300.



Respectfully Submitted,

**INTERTEK-PSI**

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

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



## **ATTACHMENT B**

Radon Test Summary Spreadsheet

Radon Testing Results		
Highland Elementary School		
Testing period: 11/13/18 - 11/16/18		
Kit Number	Room / Area	Result (pCi/L)
3918802	1	< 0.4
3918810	Across From Room 1	< 0.4
3918804	2	< 0.4
3918803	3	< 0.4
3918807	4	0.4
3918805	5	< 0.4
3918809	6	0.4
3918808	7	< 0.4
3918856	8	1.8
3918854	8A	2.3
3918853	9	2.0
3918870	9A	0.8
3918852	9B	0.7
3918851	9C	0.8
3918661	10	0.7
3918675	11	0.6
3918676	12	0.9
3918679	13	1.0
3918651	13A	< 0.4
3918653	13V	0.8
3918680	14	1.0
3918654	14A	1.0
3918684	15	1.4
3918685	16	2.3
3918683	17	1.1
3918660	18	1.7
3918658	19	1.3
3918659	20	1.4
3918657	21	1.8
3918871	22	2.9
3918873	23	2.5
3918689	24	4.9
3918690	25	1.9
3918687	26	4.4
3918688	27	1.6
3918686	28	1.6
3918877	29	1.4
3918879	30	0.6
3881160	APR	0.6
3881181	APR	0.7
3918652	Art	0.9
3918665	Building Services	< 0.4
3918677	Computer Lab	0.8

Radon Testing Results		
Highland Elementary School		
Testing period: 11/13/18 - 11/16/18		
Kit Number	Room / Area	Result (pCi/L)
3918863	Conference	0.7
3918859	Counselor	3.7
3918875	Gym	< 0.4
3918876	Gym	0.4
3918874	Gym Office	0.5
3918836	H104	< 0.4
3918835	H107	0.9
3918860	H109	< 0.4
3918833	H110	< 0.4
3918832	H111	< 0.4
3918831	H113	< 0.4
3918837	H117	< 0.4
3918838	H118	0.5
3918839	H119	< 0.4
3918840	H120	< 0.4
3918834	H123	0.4
3918671	IMC	0.4
3918672	IMC	0.7
3918673	IMC Workroom	0.6
3918662	Kitchen	0.5
3918663	Kitchen	0.6
3918880	Left of Music Room	1.5
3918670	Main Office	< 0.4
3918664	Math Closet	< 0.4
3918655	Music	1.3
3918858	Office	1.7
3918667	Para Office	0.5
3918668	Parent Resources	0.5
3918674	PD Office	0.9
3918862	Principal	0.4
3918869	SD Room	0.4
3918868	SOAR	< 0.4
3918857	SPED	0.9
3918865	Staff Lounge (Back Room)	< 0.4
3918864	Staff Lounge (Front Room)	< 0.4
3918669	Suite B (Old Health Room)	0.5
3918861	Vice Principal	0.6
3918866	Work Room	0.4

Radon Testing Results		
Highland Elementary School		
Testing period: 11/13/18 - 11/16/18		
Kit Number	QC Type	Result (pCi/L)
3918806	5 (D)	< 0.4
3918855	8A (D)	2.1
3918872	22 (D)	3.0
3918878	29 (D)	1.5
3918666	Building Services (D)	0.6
3918678	Computer Lab (D)	0.8
3918801	H104 (D)	0.5
3918656	Music (D)	1.0
3918867	Work Room (D)	0.4
3918822	Field Blank	< 0.4
3918823	Field Blank	< 0.4
3917863	Office Blank	< 0.4
3918816	Trip Blank	< 0.4



**Table Notes:**

D – Duplicate

FB – Field Blank

OB – Office Blank

TB – Transit Blank

QC – Quality Control

# **ATTACHMENT C**

Laboratory Analytical Results

NRPP 105011 AL  
NRSB ARL0007

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

Laboratory Report for:

Property Tested: Project # 04481387-1

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

MCPS Radon Survey Highland ES  
Not Indicated

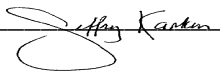
Log Number	Device Number	Test Exposure Duration:		Area Tested	Result (pCi/L)
3196322	3917863	11/13/2018 6:00 am	11/16/2018 4:00 pm	Office Blank	< 0.4
3196323	3918651	11/13/2018 1:00 pm	11/16/2018 9:48 am	First Floor Room 13A	< 0.4
3196324	3918652	11/13/2018 1:02 pm	11/16/2018 9:49 am	First Floor Room Art	0.9
3196325	3918653	11/13/2018 1:05 pm	11/16/2018 9:50 am	First Floor Room 13V	0.8
3196326	3918654	11/13/2018 1:07 pm	11/16/2018 9:51 am	First Floor Room 14A	1.0
3196327	3918655	11/13/2018 1:08 pm	11/16/2018 9:52 am	First Floor Room Music	1.3
3196328	3918656	11/13/2018 1:08 pm	11/16/2018 9:52 am	First Floor Room Music Duplicate	1.0
3196329	3918657	11/13/2018 1:10 pm	11/16/2018 9:54 am	First Floor Room 21	1.8
3196330	3918658	11/13/2018 1:11 pm	11/16/2018 9:55 am	First Floor Room 19	1.3
3196331	3918659	11/13/2018 1:12 pm	11/16/2018 9:56 am	First Floor Room 20	1.4

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

Test Performed By: Not Indicated

Distributed by: Intertek-PSI (VA)

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

Report Reviewed By: 

Report Approved By: 

**Disclaimer:**

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

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

NRPP 105011 AL  
NRSB ARL0007

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

Laboratory Report for:

Property Tested: Project # 04481387-1

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

MCPS Radon Survey Highland ES  
Not Indicated

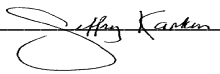
Log Number	Device Number	Test Exposure Duration:		Area Tested	Result (pCi/L)
3196332	3918660	11/13/2018 1:13 pm	11/16/2018 9:57 am	First Floor Room 18	1.7
3196333	3918661	11/13/2018 1:44 pm	11/16/2018 10:15 am	Floor Main Room 10	0.7
3196334	3918662	11/13/2018 1:48 pm	11/16/2018 10:16 am	Floor Main Room Kitchen	0.5
3196335	3918663	11/13/2018 1:48 pm	11/16/2018 10:16 am	Floor Main Room Kitchen	0.6
3196336	3918664	11/13/2018 1:56 pm	11/16/2018 10:20 am	Floor Main Room Math Closet	< 0.4
3196337	3918665	11/13/2018 1:58 pm	11/16/2018 10:22 am	Floor Main Room Building Services	< 0.4
3196338	3918666	11/13/2018 1:58 pm	11/16/2018 10:22 am	Floor Main Room Building Services Duplicate	0.6
3196339	3918667	11/13/2018 2:00 pm	11/16/2018 10:23 am	Floor Main Room Para Office	0.5
3196340	3918668	11/13/2018 2:03 pm	11/16/2018 10:24 am	Floor Main Room Parent Resources	0.5
3196341	3918669	11/13/2018 2:05 pm	11/16/2018 10:25 am	Floor Main Room Suite B Old Heath Rm	0.5

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

Test Performed By: Not Indicated

Distributed by: Intertek-PSI (VA)

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

Report Reviewed By: 

Report Approved By: 

**Disclaimer:**

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

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

NRPP 105011 AL  
NRSB ARL0007

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

Laboratory Report for:

Property Tested: Project # 04481387-1

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

MCPS Radon Survey Highland ES  
Not Indicated

Log Number	Device Number	Test Exposure Duration:		Area Tested	Result (pCi/L)
3196342	3918670	11/13/2018 2:05 pm	11/16/2018 10:26 am	Floor Main Room Main Office	< 0.4
3196343	3918671	11/13/2018 12:44 pm	11/16/2018 9:38 am	First Floor Room IMC	0.4
3196344	3918672	11/13/2018 12:45 pm	11/16/2018 9:39 am	First Floor Room IMC	0.7
3196345	3918673	11/13/2018 12:47 pm	11/16/2018 9:40 am	First Floor Room IMC	0.6
3196346	3918674	11/13/2018 12:50 pm	11/16/2018 9:41 am	First Floor Room PD Office	0.9
3196347	3918675	11/13/2018 12:53 pm	11/16/2018 9:42 am	First Floor Room 11	0.6
3196348	3918676	11/13/2018 12:55 pm	11/16/2018 9:43 am	First Floor Room 12	0.9
3196349	3918677	11/13/2018 12:56 pm	11/16/2018 9:44 am	First Floor Room Computer Lab	0.8
3196350	3918678	11/13/2018 12:56 pm	11/16/2018 9:44 am	First Floor Room Computer Lab Duplicate	0.8
3196351	3918679	11/13/2018 12:58 pm	11/16/2018 9:46 am	First Floor Room 13	1.0

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

Test Performed By: Not Indicated

Distributed by: Intertek-PSI (VA)

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

Report Reviewed By: 

Report Approved By: 

**Disclaimer:**

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

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

NRPP 105011 AL  
NRSB ARL0007

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

Laboratory Report for:

Property Tested: Project # 04481387-1

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

MCPS Radon Survey Highland ES  
Not Indicated

Log Number	Device Number	Test Exposure Duration:		Area Tested	Result (pCi/L)
3196352	3918680	11/13/2018 12:59 pm	11/16/2018 9:47 am	First Floor Room 14	1.0
3196353	3918683	11/13/2018 1:14 pm	11/16/2018 9:58 am	First Floor Room 17	1.1
3196354	3918684	11/13/2018 1:15 pm	11/16/2018 9:59 am	First Floor Room 15	1.4
3196355	3918685	11/13/2018 1:16 pm	11/16/2018 10:00 am	First Floor Room 16	2.3
3196356	3918686	11/13/2018 1:18 pm	11/16/2018 10:01 am	Floor Lower Level Room 28	1.6
3196357	3918687	11/13/2018 1:20 pm	11/16/2018 10:02 am	Floor Lower Level Room 26	4.4
3196358	3918688	11/13/2018 1:21 pm	11/16/2018 10:03 am	Floor Lower Level Room 27	1.6
3196359	3918689	11/13/2018 1:22 pm	11/16/2018 10:04 am	Floor Lower Level Room 24	4.9
3196360	3918690	11/13/2018 1:23 pm	11/16/2018 10:05 am	Floor Lower Level Room 25	1.9
3196361	3918801	11/13/2018 2:51 pm	11/16/2018 10:52 am	Floor Main Room H104 Duplicate	0.5

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

Test Performed By: Not Indicated

Distributed by: Intertek-PSI (VA)

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

Report Reviewed By: 

Report Approved By: 

**Disclaimer:**

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

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

NRPP 105011 AL  
NRSB ARL0007

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

Laboratory Report for:

Property Tested: Project # 04481387-1

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

MCPS Radon Survey Highland ES  
Not Indicated

Log Number	Device Number	Test Exposure Duration:		Area Tested	Result (pCi/L)
3196362	3918802	11/13/2018 3:07 pm	11/16/2018 10:58 am	Floor Lower Level Room 1	< 0.4
3196363	3918803	11/13/2018 3:10 pm	11/16/2018 10:59 am	Floor Lower Level Room 3	< 0.4
3196364	3918804	11/13/2018 3:12 pm	11/16/2018 11:00 am	Floor Lower Level Room 2	< 0.4
3196365	3918805	11/13/2018 3:14 pm	11/16/2018 11:01 am	Floor Lower Level Room 5	< 0.4
3196366	3918806	11/13/2018 3:14 pm	11/16/2018 11:01 am	Floor Lower Level Room 5 Duplicate	< 0.4
3196367	3918807	11/13/2018 3:15 pm	11/16/2018 11:03 am	Floor Lower Level Room 4	0.4
3196368	3918808	11/13/2018 3:17 pm	11/16/2018 11:04 am	Floor Lower Level Room 7	< 0.4
3196369	3918809	11/13/2018 3:18 pm	11/16/2018 11:05 am	Floor Lower Level Room 6	0.4
3196370	3918810	11/13/2018 3:20 pm	11/16/2018 11:06 am	Floor Lower Level Across From Room 1	< 0.4
3196371	3918816	11/13/2018 6:00 am	11/16/2018 4:00 pm	Trip Blank	< 0.4

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

Test Performed By: Not Indicated

Distributed by: Intertek-PSI (VA)

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

Report Reviewed By: 

Report Approved By: 

**Disclaimer:**

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

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

NRPP 105011 AL  
NRSB ARL0007

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

Laboratory Report for:

Property Tested: Project # 04481387-1

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

MCPS Radon Survey Highland ES  
Not Indicated

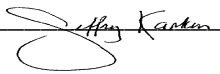
Log Number	Device Number	Test Exposure Duration:		Area Tested	Result (pCi/L)
3196372	3918822	11/13/2018 12:44 pm	11/16/2018 11:06 am	Field Blank	< 0.4
3196373	3918823	11/13/2018 12:44 pm	11/16/2018 11:06 am	Field Blank	< 0.4
3196374	3918831	11/13/2018 2:44 pm	11/16/2018 10:47 am	Floor Main Room H113	< 0.4
3196375	3918832	11/13/2018 2:45 pm	11/16/2018 10:48 am	Floor Main Room H111	< 0.4
3196376	3918833	11/13/2018 2:47 pm	11/16/2018 10:49 am	Floor Main Room H110	< 0.4
3196377	3918834	11/13/2018 2:48 pm	11/16/2018 10:50 am	Floor Main Room H123	0.4
3196378	3918835	11/13/2018 2:49 pm	11/16/2018 10:51 am	Floor Main Room H107	0.9
3196379	3918836	11/13/2018 2:51 pm	11/16/2018 10:52 am	Floor Main Room H104	< 0.4
3196380	3918837	11/13/2018 2:52 pm	11/16/2018 10:53 am	Floor Main Room H117	< 0.4
3196381	3918838	11/13/2018 2:54 pm	11/16/2018 10:54 am	Floor Main Room H118	0.5

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

Test Performed By: Not Indicated

Distributed by: Intertek-PSI (VA)

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

Report Reviewed By: 

Report Approved By: 

**Disclaimer:**

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

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



NRPP 105011 AL  
NRSB ARL0007

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

Laboratory Report for:

Property Tested: Project # 04481387-1

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

MCPS Radon Survey Highland ES  
Not Indicated

Log Number	Device Number	Test Exposure Duration:		Area Tested		Result (pCi/L)
3196382	3918839	11/13/2018 2:56 pm	11/16/2018 10:55 am	Floor Main Room H119		< 0.4
3196383	3918840	11/13/2018 2:57 pm	11/16/2018 10:56 am	Floor Main Room H120		< 0.4
3196384	3918851	11/13/2018 2:22 pm	11/16/2018 10:37 am	Floor Main Room 9C		0.8
3196385	3918852	11/13/2018 2:23 pm	11/16/2018 10:38 am	Floor Main Room 9B		0.7
3196386	3918853	11/13/2018 2:24 pm	11/16/2018 10:39 am	Floor Main Room 9		2.0
3196387	3918854	11/13/2018 12:25 pm	11/16/2018 10:40 am	Floor Main Room 8A		2.3
3196388	3918855	11/13/2018 12:25 pm	11/16/2018 10:40 am	Floor Main Room 8A Duplicate		2.1
3196389	3918856	11/13/2018 12:25 pm	11/16/2018 10:40 am	Floor Main Room 8		1.8
3196390	3918857	11/13/2018 2:31 pm	11/16/2018 10:43 am	Floor Main Room SPED		0.9
3196391	3918858	11/13/2018 2:32 pm	11/16/2018 10:44 am	Floor Main Room Office		1.7

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

Test Performed By: Not Indicated

Distributed by: Intertek-PSI (VA)

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

Report Reviewed By: 

Report Approved By: 

**Disclaimer:**

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

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

NRPP 105011 AL  
NRSB ARL0007

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

Laboratory Report for:

Property Tested: Project # 04481387-1

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

MCPS Radon Survey Highland ES  
Not Indicated

Log Number	Device Number	Test Exposure Duration:		Area Tested	Result (pCi/L)
3196392	3918859	11/13/2018 2:33 pm	11/16/2018 10:45 am	Floor Main Room Counselor	3.7
3196393	3918860	11/13/2018 2:42 pm	11/16/2018 10:46 am	Floor Main Room H109	< 0.4
3196394	3918861	11/13/2018 2:06 pm	11/16/2018 10:27 am	Floor Main Room Vice Principal	0.6
3196395	3918862	11/13/2018 2:08 pm	11/16/2018 10:28 am	Floor Main Room Principal	0.4
3196396	3918863	11/13/2018 2:09 pm	11/16/2018 10:29 am	Floor Main Room Conference	0.7
3196397	3918864	11/13/2018 2:11 pm	11/16/2018 10:30 am	Floor Main Room Staff Lounge Front Room	< 0.4
3196398	3918865	11/13/2018 2:14 pm	11/16/2018 10:31 am	Floor Main Room Staff Lounge Back Room	< 0.4
3196399	3918866	11/13/2018 2:15 pm	11/16/2018 10:33 am	Floor Main Room Work	0.4
3196400	3918867	11/13/2018 2:17 pm	11/16/2018 10:33 am	Floor Main Room Work Duplicate	0.4
3196401	3918868	11/13/2018 2:17 pm	11/16/2018 10:34 am	Floor Main Room SOAR	< 0.4

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

Test Performed By: Not Indicated

Distributed by: Intertek-PSI (VA)

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

Report Reviewed By: 

Report Approved By: 

**Disclaimer:**

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

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

NRPP 105011 AL  
NRSB ARL0007

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

Laboratory Report for:

Property Tested: Project # 04481387-1

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

MCPS Radon Survey Highland ES  
Not Indicated

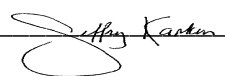
Log Number	Device Number	Test Exposure Duration:		Area Tested	Result (pCi/L)
3196402	3918869	11/13/2018 2:19 pm	11/16/2018 10:35 am	Floor Main Room SD	0.4
3196403	3918870	11/13/2018 2:20 pm	11/16/2018 10:36 am	Floor Main Room 9A	0.8
3196404	3918871	11/13/2018 1:25 pm	11/16/2018 10:06 am	Floor Lower Level Room 22	2.9
3196405	3918872	11/13/2018 1:25 pm	11/16/2018 10:06 am	Floor Lower Level Room 22 Duplicate	3.0
3196406	3918873	11/13/2018 1:26 pm	11/16/2018 10:07 am	Floor Lower Level Room 23	2.5
3196407	3918874	11/13/2018 1:27 pm	11/16/2018 10:08 am	Floor Lower Level Room Gym Office	0.5
3196408	3918875	11/13/2018 1:28 pm	11/16/2018 10:09 am	Floor Lower Level Room Gym	< 0.4
3196409	3918876	11/13/2018 1:28 pm	11/16/2018 10:10 am	Floor Lower Level Room Gym	0.4
3196410	3918877	11/13/2018 1:33 pm	11/16/2018 10:12 am	Floor Lower Level Room 29	1.4
3196411	3918878	11/13/2018 1:33 pm	11/16/2018 10:12 am	Floor Lower Level Room 29 Duplicate	1.5

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

Test Performed By: Not Indicated

Distributed by: Intertek-PSI (VA)

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

Report Reviewed By: 

Report Approved By: 

**Disclaimer:**

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

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

NRPP 105011 AL  
NRSB ARL0007

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

Laboratory Report for:

Property Tested: Project # 04481387-1

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

MCPS Radon Survey Highland ES  
Not Indicated

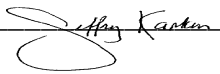
Log Number	Device Number	Test Exposure Duration:		Area Tested		Result (pCi/L)
3196412	3918879	11/13/2018 1:35 pm	11/16/2018 10:13 am	Floor Lower Level Room 30		0.6
3196413	3918880	11/13/2018 1:39 pm	11/16/2018 10:14 am	Floor Lower Level Left of Music Room		1.5

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

Test Performed By: Not Indicated

Distributed by: Intertek-PSI (VA)

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

Report Reviewed By: 

Report Approved By: 

**Disclaimer:**

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

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

NELAC NY 11769  
NRPP 103216 AL  
NRSB ARL0017

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

Laboratory Report for:

Property Tested: Project # 04481387-1

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

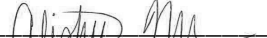
MCPS Radon Survey  
Highland ES  
Silver Spring MD 20902

Log Number	Device Number	Test Exposure Duration:	Area Tested	Result pCi/L
2393046	3881160	11/13/2018 1:51 pm 11/16/2018 10:18 am	Not Indicated	0.6

**Comment:** AMENDED REPORT for 3881160 on 1/8/19 to add the date and time the test began and ended and the property test address. A copy of this report was emailed to Intertek-PSI (VA).

Distributed by: Intertek-PSI (VA)

Date Received: 11/17/2018 Date Logged: 11/17/2018 Date Analyzed: 11/19/2018 Date Reported: 01/02/2019

Report Reviewed By: 

Report Approved By: 

**Disclaimer:**

Shawn Price, Director of Laboratory Operations, AccuStar Labs

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

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

NELAC NY 11769  
NRPP 103216 AL  
NRSB ARL0017

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

Laboratory Report for:

Property Tested: Project # 04481387-1

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


MCPS Radon Survey  
Highland ES  
Silver Spring MD 20902

Log Number	Device Number	Test Exposure Duration:	Area Tested	Result pCi/L
2393047	3881181	11/13/2018 1:51 pm 11/16/2018 10:19 am	Not Indicated	0.7

**Comment:** AMENDED REPORT for 3881181 on 1/8/19 to add the date and time the test began and ended and the property test address. A copy of this report was emailed to Intertek-PSI (VA).

Distributed by: Intertek-PSI (VA)

Date Received: 11/17/2018 Date Logged: 11/17/2018 Date Analyzed: 11/19/2018 Date Reported: 01/02/2019

Report Reviewed By: 

Report Approved By: 

**Disclaimer:**

Shawn Price, Director of Laboratory Operations, AccuStar Labs

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

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

NRPP 105011 AL  
NRSB ARL0007  
Ohio RL41

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

Laboratory Report for:

Property Tested:

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

MCPS Radon Survey  
4514 Taylorsville Road  
Dayton OH 45424

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

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

Test Performed By: Unknown

Distributed by: Intertek-PSI (VA)

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

Report Reviewed By: 

Report Approved By: 

**Disclaimer:**

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

Shawn Price, Director of Laboratory Operations, AccuStar Labs

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

# EXPOSURE IN BOWSER-MORNER RADON CHAMBER

CLIENT Intertek - PSI

Job Number 187732

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

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

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

Time Start: 0947 Time Stop: 0947

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

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

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

3926831 thru 3926840

G2 Left

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

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

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

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

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

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

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

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

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

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

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

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

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



## Chain of Custody

Project Name: MCPS Radon Survey 2018

Name of Schools:

- |                     |                      |                    |
|---------------------|----------------------|--------------------|
| 1. Highland View ES | 6. EB Lee MS         | 11. Cannon Rd ES   |
| 2. Kemp Mill ES     | 7. Forest Knolls ES  | 12. Cloverly ES    |
| 3. Sligo Creek ES   | 8. Galway ES         | 13. Springbrook HS |
| 4. Highland ES      | 9. Wheaton HS        |                    |
| 5. Kennedy HS       | 10. Briggs Chaney MS |                    |

---

	Date	Initials
Radon Test Kits Deployed	11/13/2018	NL
Radon Test Kits Sampled	11/16/2018	NL
Radon Test Kits Shipped to Lab*	11/16/2018	NL
Radon Test Kits Received by Lab*	11/17/2018; 11/18/2018; 11/20/2018	NL

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

**MCPS RADON TESTING - EXECUTIVE SUMMARY**

Site Name	Highland Elementary School
Date of Report	March 13, 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	32
# Rooms $\geq 4.0$ pCi/L	2
Lowest Value	< 0.3 pCi/L
Highest Value	10.0 pCi/L

**Project Status**

Rooms with results  $\geq 4.0$  pCi/L: Gym Office (10.0 pCi/L), STO (4.0 pCi/L)

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



ENGINEERS • PLANNERS • SCIENTISTS • CONSTRUCTION MANAGERS

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

March 13, 2018

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

Re: Radon Testing Services

KCI Job #1214634188

**Location: Highland Elementary School**

3100 Medway St.  
Silver Spring, Maryland 20902

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 Highland Elementary School, located at 3100 Medway St. in Silver Spring, Maryland 20902 (subject site).

**SCOPE OF SERVICES**

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

KCI visited the site on November 28, 2017 and deployed thirty-six 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 December 1, 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:

- Follow-up to HVAC upgrade testing.

These tests were conducted to:

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

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

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

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

KCI also compiled weather data for the testing period and conducted observations of relevant field conditions. During the test period, weather records indicate low temperatures 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>
≥4.0 pCi/L	Gym Office	10.0
≥4.0 pCi/L	STO	4.0
≤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		
Highland Elementary School		
Test Period: 02/12/18-02/15/18		
Kit Number	Room / Area	Result
7986748	17	1.1
7986744	18	1.2
7986743	21	1.5
7986749	23	1.9
7986746	14A	1.5
7986747	14C	1.5
7986723	COM	3.8
7986717	GYM OFFICE	10.0
7986720	H102	0.8
7986738	H107	1.7
7986739	H110	0.7
7986728	H111	0.6
7986731	H113	< 0.3
7986732	H118	< 0.3
7986733	* H119 (Tampered - Void by Lab)	-
7986726	H120	< 0.3
7986727	H123	0.6
7986751	IMC	2.7
7986745	KITCHEN	3.0
7986740	KITCHEN OFFICE	3.8
7986729	LINK ROOM A	1.2
7986730	LINK ROOM B	0.8
7986722	LINK ROOM C	1.0
7986710	MN. OFFICE STE B	3.3
7986742	OFF. BESIDE SR	1.2
7986734	SL2	1.4
7986737	SP. ED. 9A	1.4
7986750	SP. EDUC. MATH	1.5
7986735	SPECIAL EDUCATIO	1.9
7986741	SR	1.5
7986724	SR-1	2.7
7986721	STO	4.0

Table Note:

\* Missing or Compromised Sample

Table 2- Highland Elementary School		
Test Period: 02/12/18-02/15/18		
Kit Number	QC Type	Result
7986725	D (H123)	< 0.3
7986736	D (SPECIAL EDUCATIO)	1.4
7986719	D (SR-1)	2.6
7986716	FB (STO)	< 0.3

Table Note:

\* Missing or Compromised Sample

# ATTACHMENT C

## Laboratory Analytical Results

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

Kit #	Room Id	Started	Ended	pCi/L	Analyzed
7986746	14A	2018-02-12 @ 8:00 am	2018-02-15 @ 11:00 am	1.5 ± 0.3	2018-02-19
7986747	14C	2018-02-12 @ 8:00 am	2018-02-15 @ 11:00 am	1.5 ± 0.3	2018-02-19
7986748	17	2018-02-12 @ 8:00 am	2018-02-15 @ 11:00 am	1.1 ± 0.3	2018-02-19
7986744	18	2018-02-12 @ 8:00 am	2018-02-15 @ 11:00 am	1.2 ± 0.3	2018-02-19
7986743	21	2018-02-12 @ 8:00 am	2018-02-15 @ 11:00 am	1.5 ± 0.4	2018-02-19
7986749	23	2018-02-12 @ 8:00 am	2018-02-15 @ 11:00 am	1.9 ± 0.4	2018-02-19
7986723	COM	2018-02-12 @ 10:00 am	2018-02-15 @ 11:00 am	3.8 ± 0.4	2018-02-19
7986717	GYM OFFICE	2018-02-12 @ 10:00 am	2018-02-15 @ 11:00 am	10.0 ± 0.7	2018-02-19
7986720	H102	2018-02-12 @ 10:00 am	2018-02-15 @ 11:00 am	0.8 ± 0.3	2018-02-19
7986738	H107	2018-02-12 @ 9:00 am	2018-02-15 @ 11:00 am	1.7 ± 0.4	2018-02-19
7986739	H110	2018-02-12 @ 9:00 am	2018-02-15 @ 11:00 am	0.7 ± 0.3	2018-02-19
7986728	H111	2018-02-12 @ 9:00 am	2018-02-15 @ 11:00 am	0.6 ± 0.3	2018-02-19
7986731	H113	2018-02-12 @ 9:00 am	2018-02-15 @ 11:00 am	< 0.3	2018-02-19
7986732	H118	2018-02-12 @ 9:00 am	2018-02-15 @ 11:00 am	< 0.3	2018-02-19
7986726	H120	2018-02-12 @ 9:00 am	2018-02-15 @ 11:00 am	< 0.3	2018-02-19
7986727	H123	2018-02-12 @ 9:00 am	2018-02-15 @ 11:00 am	0.6 ± 0.3	2018-02-19
7986725	H123	2018-02-12 @ 9:00 am	2018-02-15 @ 11:00 am	< 0.3	2018-02-19
7986751	IMC	2018-02-12 @ 9:00 am	2018-02-15 @ 11:00 am	2.7 ± 0.4	2018-02-19
7986745	KITCHEN	2018-02-12 @ 9:00 am	2018-02-15 @ 11:00 am	3.0 ± 0.4	2018-02-19
7986740	KITCHEN OFFICE	2018-02-12 @ 9:00 am	2018-02-15 @ 11:00 am	3.8 ± 0.5	2018-02-19
7986729	LINK ROOM A	2018-02-12 @ 10:00 am	2018-02-15 @ 11:00 am	1.2 ± 0.3	2018-02-19
7986730	LINK ROOM B	2018-02-12 @ 10:00 am	2018-02-15 @ 11:00 am	0.8 ± 0.3	2018-02-19
7986722	LINK ROOM C	2018-02-12 @ 10:00 am	2018-02-15 @ 11:00 am	1.0 ± 0.3	2018-02-19
7986710	MN. OFFICE STE B	2018-02-12 @ 10:00 am	2018-02-15 @ 11:00 am	3.3 ± 0.4	2018-02-19
7986742	OFF. BESIDE SR	2018-02-12 @ 9:00 am	2018-02-15 @ 11:00 am	1.2 ± 0.3	2018-02-19
7986734	SL2	2018-02-12 @ 9:00 am	2018-02-15 @ 11:00 am	1.4 ± 0.3	2018-02-19
7986737	SP. ED. 9A	2018-02-12 @ 9:00 am	2018-02-15 @ 11:00 am	1.4 ± 0.4	2018-02-19
7986750	SP. EDUC. MATH	2018-02-12 @ 9:00 am	2018-02-15 @ 11:00 am	1.5 ± 0.4	2018-02-19
7986735	SPECIAL EDUCATIO	2018-02-12 @ 9:00 am	2018-02-15 @ 11:00 am	1.9 ± 0.4	2018-02-19
7986736	SPECIAL EDUCATIO	2018-02-12 @ 9:00 am	2018-02-15 @ 11:00 am	1.4 ± 0.3	2018-02-19
7986724	SR-1	2018-02-12 @ 10:00 am	2018-02-15 @ 11:00 am	2.7 ± 0.4	2018-02-19
7986719	SR-1	2018-02-12 @ 10:00 am	2018-02-15 @ 11:00 am	2.6 ± 0.4	2018-02-19
7986741	SR	2018-02-12 @ 9:00 am	2018-02-15 @ 11:00 am	1.5 ± 0.4	2018-02-19
7986721	STO	2018-02-12 @ 10:00 am	2018-02-15 @ 11:00 am	4.0 ± 0.4	2018-02-19
7986716	STO	2018-02-12 @ 10:00 am	2018-02-15 @ 11:00 am	< 0.3	2018-02-19

---

February 27, 2018

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

---

Radon test result report for:

**HIGHLAND ELEMENTARY SCHOOL  
MAIN**

---

Kit #	Room Id	Started	Ended	pCi/L	Analyzed
7986733	H119	2018-02-12 @ 9:00 am	2018-02-15 @ 11:00 am	???? UI	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



---

February 28, 2018

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

---

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: 2/16/18 Date Stop: 2/19/18 Date Start: \_\_\_\_\_ Date Stop: \_\_\_\_\_

Time Start: 1052 Time Stop: 1052 Time Start: \_\_\_\_\_ Time Stop: \_\_\_\_\_

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

7984181, 7986621, 7985683 \_\_\_\_\_

7984168, 7986618, 7984169 \_\_\_\_\_

G3 Middle \_\_\_\_\_

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

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

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

\_\_\_\_\_

\_\_\_\_\_

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

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

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

\_\_\_\_\_

\_\_\_\_\_

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

**MCPS RADON TESTING - EXECUTIVE SUMMARY**

Site Name	Highland Elementary School
Date of Report	January 31, 2018
Round of Testing	Initial Follow-up Post Remediation 2 year testing 5 year testing <b>HVAC Upgrade</b> Window Replacement New Addition New Facility
# of Rooms Tested	54
# Rooms $\geq 4.0$ pCi/L	0
Lowest Value	< 0.3 pCi/L
Highest Value	3.1 pCi/L

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



ENGINEERS • PLANNERS • SCIENTISTS • CONSTRUCTION MANAGERS

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

January 31, 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: Highland Elementary School**

3100 Medway St.  
Silver Spring, Maryland 20902

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 Highland Elementary School, located at 3100 Medway St. in Silver Spring, Maryland 20902 (subject site).

**SCOPE OF SERVICES**

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

KCI visited the site on November 28, 2017 and deployed sixty-eight (68) activated charcoal (AC) radon test kits. KCI deployed radon test kits in frequently-occupied ground contact rooms, and other areas, (if applicable) in accordance with AARST guidance. A floor plan map of the building with the test locations is included as 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 1, 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:

- HVAC upgrade testing.

These tests were conducted to:

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

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

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

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

KCI also compiled weather data for the testing period and conducted observations of relevant field conditions. During the test period, weather records indicate low temperatures were in the 30s and high temperatures ranged from the low-50s to mid-60s. Maximum sustained winds ranged from 8-15 miles per hour. Average humidity was around 65%. 0.02 Inches of precipitation was recorded during the testing period.

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

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

## **RESULTS**

The sampling locations, field observations, and analytical results are listed on Table 1 (Attachment B). The quality control sample locations and analytical results are listed on Table 2 (Attachment B). Missing/compromised tests, missed rooms, and locked rooms are listed on Table 3 (Attachment B). The laboratory analytical results are included in Attachment C. Laboratory results and exposure data for the spike samples are also included in Attachment C.

The results of the radon test analysis indicated the following:

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

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

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

Sincerely,



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

**Attachments:**

B - Tables 1-3, Radon Test Summary Spreadsheets

C- Laboratory Analytical Results

## ATTACHMENT B

### Radon Test Summary Spreadsheet



**Table Notes:**

AC- Activated Charcoal

ACI- Air Chek, Inc.

D- Duplicate

FB- Field Blank

KCI- KCI Technologies, Inc.

OB- Office Blank

PM- Project Manager

QC- Quality Control

Radon Testing Results		
Highland Elementary School		
Test Period: 11/28/17-12/01/17		
Kit Number	Room / Area	Result
7975831	1	1.0
7975855	2	1.6
7975824	3	1.2
7975811	4	1.0
7975832	5	1.3
7975856	6	3.1
7975825	7	1.9
7975821	8	1.3
7975884	9	1.6
7975843	10	1.5
7975842	11	1.7
7975865	12	2.5
7975857	13	2.1
7975892	14	2.4
7975890	15	0.8
7975889	16	0.7
7975887	19	0.6
7975888	20	0.8
7975872	22	1.9
7975878	24	1.8
7975869	25	1.1
7975863	26	1.9
7975870	27	0.7
7975871	28	1.7
7975877	29	1.0
7975875	30	0.6
7975898	14A	0.6
7975864	* 23 (Missing)	2.6
7975819	8A	1.2
7975853	9A	1.1
7975883	9B	1.2
7975894	ART	0.9
7975862	BUILDING SERVICE	1.8
7975886	* COM (Missing)	-
7975866	COMPUTER LABS	1.6
7975820	COUNSELOR	2.1
7975867	GYM	2.2
7975899	GYM	2.6
7975900	GYM	2.6
7975822	H104	0.6
7975846	HR	2.8
7975841	IMC	2.9
7975845	IMC	2.8
7975881	MAIN OFFICE	1.9
7975876	MU	0.9
7975895	MU2	0.6

Table Note:

\* Missing or Compromised Sample

<b>Radon Testing Results</b>		
<b>Highland Elementary School</b>		
<b>Test Period: 11/28/17-12/01/17</b>		
<b>Kit Number</b>	<b>Room / Area</b>	<b>Result</b>
7975859	MULTI PURPOSE	1.5
7975860	MULTI PURPOSE	1.6
7975850	PRINCIPAL	1.8
7975896	PRR	1.6
7975848	SL	1.2
7975851	SL EXTEND	0.9
7975852	SOAR	0.9
7975893	SR1	0.5
7975897	SR1	1.5
7975858	SR2	2.5
7975880	STO	0.7
7975861	VP	1.6
7975847	WORK ROOM	1.6

Table Note:

\* Missing or Compromised Sample

Radon Testing Results		
Highland Elementary School		
Test Period: 11/28/17-12/01/17		
Kit Number	QC Type	Result
7975844	D (10)	1.5
7975891	D (19)	0.9
7975879	D (29)	1.0
7975849	D (3)	1.0
7975854	D (9A)	1.1
7975882	D (MAIN OFFICE)	< 0.3
7975885	FB (13)	< 0.3
7975823	FB (3)	< 0.3
7978578	OB (OB)	< 0.3

Table Note:

\* Missing or Compromised Sample

Summary of Missed Locations		
Highland Elementary School		
Test Period: 11/27/17-12/01/17		
Kit Number	Room / Area	Result
-	14A (Missed location)	-
-	14C (Missed location)	-
-	17 (Missed location)	-
-	18 (Missed location)	-
-	21 (Missed location)	-
-	H102 (Missed location)	-
-	SPECIAL EDUCATION (Missed location)	-
-	H107 (Missed location)	-
-	H110 (Missed location)	-
-	H111 (Missed location)	-
-	H113 (Missed location)	-
-	H118 (Missed location)	-
-	H119 (Missed location)	-
-	H120 (Missed location)	-
-	H123 (Missed location)	-
-	MAIN OFFICE SUITE B (Missed location)	-
-	SL2 (Missed location)	-
-	SPECIAL EDUCATION 9A (Missed location)	-
-	SPECIAL EDUCATION MATH (Missed location)	-
-	IMC (Missed location)	-
-	OFFICE BESIDE SR (Missed location)	-
-	SR (Missed location)	-
-	KITCHEN (Missed location)	-
-	KITCHEN OFFICE (Missed location)	-
-	LINK ROOM A (Missed location)	-
-	LINK ROOM B (Missed location)	-
-	LINK ROOM C (Missed location)	-

Table Note:

# ATTACHMENT C

## Laboratory Analytical Results



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 Phase

Names of Schools:

- |                                    |                                   |
|------------------------------------|-----------------------------------|
| 1. Chevy Chase Elementary School   | 15. Viers Mill Elementary School  |
| 2. Greencastle Elementary School   | 16. Albert Einstein High School   |
| 3. English Manor                   | 17. Wayside Elementary School     |
| 4. Rock View Elementary School     | 18. Thomas S. Wootton High School |
| 5. Wheaton Woods Elementary School | 19. Highland Elementary School    |
| 6. Sequoyah Elementary School      | 20. Bethesda Transportation Depot |
| 7. Fallsmead Elementary School     | 21. Bethesda Maintenance Depot    |
| 8. Beall Elementary School         | 22. Travilah Elementary School    |
| 9. Stephen Knolls School           | 23. Lathrop E. Smith Center       |
| 10. Maryvale Elementary School     |                                   |
| 11. Redland Middle School          |                                   |
| 12. Walt Whitman High School       |                                   |
| 13. Springbrook High School        |                                   |
| 14. Blair G. Ewing Center          |                                   |

---

	Date	Initials
Radon Test Kits Deployed	11/28/17	JM
Radon Test Kits Collected	12/01/17	JM
Radon Test Kits Shipped to Lab*	12/01/17	JM
Radon Test Kits Received by Lab*	12/05/17	JM

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

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

Kit #	Room Id	Started	Ended	pCi/L	Analyzed
7975831	1	2017-11-28 @ 5:00 pm	2017-12-01 @ 9:00 am	1.0 ± 0.3	2017-12-04
7975843	10	2017-11-28 @ 4:00 pm	2017-12-01 @ 9:00 am	1.5 ± 0.3	2017-12-04
7975844	10	2017-11-28 @ 4:00 pm	2017-12-01 @ 9:00 am	1.5 ± 0.3	2017-12-04
7975842	11	2017-11-28 @ 4:00 pm	2017-12-01 @ 9:00 am	1.7 ± 0.3	2017-12-04
7975865	12	2017-11-28 @ 4:00 pm	2017-12-01 @ 9:00 am	2.5 ± 0.3	2017-12-04
7975885	13	2017-11-28 @ 4:00 pm	2017-12-01 @ 9:00 am	< 0.3	2017-12-04
7975857	13	2017-11-28 @ 4:00 pm	2017-12-01 @ 9:00 am	2.1 ± 0.3	2017-12-04
7975892	14	2017-11-28 @ 4:00 pm	2017-12-01 @ 9:00 am	2.4 ± 0.3	2017-12-04
7975898	14A	2017-11-28 @ 3:00 pm	2017-12-01 @ 10:00 am	0.6 ± 0.3	2017-12-04
7975890	15	2017-11-28 @ 4:00 pm	2017-12-01 @ 9:00 am	0.8 ± 0.3	2017-12-04
7975889	16	2017-11-28 @ 4:00 pm	2017-12-01 @ 9:00 am	0.7 ± 0.3	2017-12-04
7975887	19	2017-11-28 @ 4:00 pm	2017-12-01 @ 10:00 am	0.6 ± 0.3	2017-12-04
7975891	19	2017-11-28 @ 4:00 pm	2017-12-01 @ 10:00 am	0.9 ± 0.3	2017-12-04
7975855	2	2017-11-28 @ 5:00 pm	2017-12-01 @ 9:00 am	1.6 ± 0.3	2017-12-04
7975888	20	2017-11-28 @ 4:00 pm	2017-12-01 @ 10:00 am	0.8 ± 0.3	2017-12-04
7975872	22	2017-11-28 @ 3:00 pm	2017-12-01 @ 10:00 am	1.9 ± 0.3	2017-12-04
7975864	23	2017-11-28 @ 3:00 pm	2017-12-01 @ 10:00 am	2.6 ± 0.3	2017-12-04
7975878	24	2017-11-28 @ 3:00 pm	2017-12-01 @ 10:00 am	1.8 ± 0.3	2017-12-04
7975869	25	2017-11-28 @ 3:00 pm	2017-12-01 @ 10:00 am	1.1 ± 0.3	2017-12-04
7975863	26	2017-11-28 @ 3:00 pm	2017-12-01 @ 10:00 am	1.9 ± 0.3	2017-12-04
7975870	27	2017-11-28 @ 3:00 pm	2017-12-01 @ 10:00 am	0.7 ± 0.3	2017-12-04
7975871	28	2017-11-28 @ 3:00 pm	2017-12-01 @ 10:00 am	1.7 ± 0.3	2017-12-04
7975877	29	2017-11-28 @ 3:00 pm	2017-12-01 @ 10:00 am	1.0 ± 0.3	2017-12-04
7975879	29	2017-11-28 @ 3:00 pm	2017-12-01 @ 10:00 am	1.0 ± 0.3	2017-12-04
7975823	3	2017-11-28 @ 5:00 pm	2017-12-01 @ 9:00 am	< 0.3	2017-12-04
7975824	3	2017-11-28 @ 5:00 pm	2017-12-01 @ 9:00 am	1.2 ± 0.3	2017-12-04
7975849	3	2017-11-28 @ 5:00 pm	2017-12-01 @ 9:00 am	1.0 ± 0.3	2017-12-04
7975875	30	2017-11-28 @ 3:00 pm	2017-12-01 @ 10:00 am	0.6 ± 0.3	2017-12-04
7975811	4	2017-11-28 @ 5:00 pm	2017-12-01 @ 9:00 am	1.0 ± 0.3	2017-12-04
7975832	5	2017-11-28 @ 5:00 pm	2017-12-01 @ 9:00 am	1.3 ± 0.3	2017-12-04
7975856	6	2017-11-28 @ 5:00 pm	2017-12-01 @ 9:00 am	3.1 ± 0.4	2017-12-04
7975825	7	2017-11-28 @ 5:00 pm	2017-12-01 @ 9:00 am	1.9 ± 0.3	2017-12-04
7975821	8	2017-11-28 @ 5:00 pm	2017-12-01 @ 9:00 am	1.3 ± 0.3	2017-12-04
7975819	8A	2017-11-28 @ 5:00 pm	2017-12-01 @ 4:00 pm	1.2 ± 0.3	2017-12-04
7975884	9	2017-11-28 @ 5:00 pm	2017-12-01 @ 9:00 am	1.6 ± 0.3	2017-12-04
7975853	9A	2017-11-28 @ 4:00 pm	2017-12-01 @ 9:00 am	1.1 ± 0.3	2017-12-04
7975854	9A	2017-11-28 @ 4:00 pm	2017-12-01 @ 9:00 am	1.1 ± 0.3	2017-12-04



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

Kit #	Room Id	Started	Ended	pCi/L	Analyzed
7975883	9B	2017-11-28 @ 4:00 pm	2017-12-01 @ 9:00 am	1.2 ± 0.3	2017-12-04
7975894	ART	2017-11-28 @ 3:00 pm	2017-12-01 @ 10:00 am	0.9 ± 0.3	2017-12-04
7975862	BUILDING SERVICE	2017-11-28 @ 3:00 pm	2017-12-01 @ 9:00 am	1.8 ± 0.3	2017-12-04
7975866	COMPUTER LABS	2017-11-28 @ 4:00 pm	2017-12-01 @ 9:00 am	1.6 ± 0.3	2017-12-04
7975820	COUNSELOR	2017-11-28 @ 5:00 pm	2017-12-01 @ 9:00 am	2.1 ± 0.3	2017-12-04
7975867	GYM	2017-11-28 @ 3:00 pm	2017-12-01 @ 9:00 am	2.2 ± 0.3	2017-12-04
7975899	GYM	2017-11-28 @ 3:00 pm	2017-12-01 @ 10:00 am	2.6 ± 0.3	2017-12-04
7975900	GYM	2017-11-28 @ 3:00 pm	2017-12-01 @ 10:00 am	2.6 ± 0.3	2017-12-04
7975822	H104	2017-11-28 @ 5:00 pm	2017-12-01 @ 9:00 am	0.6 ± 0.3	2017-12-04
7975846	HR	2017-11-28 @ 4:00 pm	2017-12-01 @ 9:00 am	2.8 ± 0.4	2017-12-04
7975845	IMC	2017-11-28 @ 4:00 pm	2017-12-01 @ 9:00 am	2.8 ± 0.4	2017-12-04
7975841	IMC	2017-11-28 @ 4:00 pm	2017-12-01 @ 9:00 am	2.9 ± 0.4	2017-12-04
7975881	MAIN OFFICE	2017-11-28 @ 2:00 pm	2017-12-01 @ 10:00 am	1.9 ± 0.3	2017-12-04
7975882	MAIN OFFICE	2017-11-28 @ 3:00 pm	2017-12-01 @ 9:00 am	< 0.3	2017-12-04
7975876	MU	2017-11-28 @ 3:00 pm	2017-12-01 @ 10:00 am	0.9 ± 0.3	2017-12-04
7975895	MU2	2017-11-28 @ 3:00 pm	2017-12-01 @ 10:00 am	0.6 ± 0.3	2017-12-04
7975859	MULTI PURPOSE	2017-11-28 @ 3:00 pm	2017-12-01 @ 9:00 am	1.5 ± 0.3	2017-12-04
7975860	MULTI PURPOSE	2017-11-28 @ 3:00 pm	2017-12-01 @ 9:00 am	1.6 ± 0.3	2017-12-04
7975878	OB	2017-11-28 @ 4:00 pm	2017-12-01 @ 4:00 pm	< 0.3	2017-12-04
7975850	PRINCIPAL	2017-11-28 @ 4:00 pm	2017-12-01 @ 9:00 am	1.8 ± 0.3	2017-12-04
7975896	PRR	2017-11-28 @ 3:00 pm	2017-12-01 @ 9:00 am	1.6 ± 0.3	2017-12-04
7975848	SL	2017-11-28 @ 4:00 pm	2017-12-01 @ 9:00 am	1.2 ± 0.3	2017-12-04
7975851	SL EXTEND	2017-11-28 @ 4:00 pm	2017-12-01 @ 9:00 am	0.9 ± 0.3	2017-12-04
7975852	SOAR	2017-11-28 @ 4:00 pm	2017-12-01 @ 9:00 am	0.9 ± 0.3	2017-12-04
7975897	SR1	2017-11-28 @ 3:00 pm	2017-12-01 @ 9:00 am	1.5 ± 0.3	2017-12-04
7975893	SR1	2017-11-28 @ 3:00 pm	2017-12-01 @ 10:00 am	0.5 ± 0.3	2017-12-04
7975858	SR2	2017-11-28 @ 5:00 pm	2017-12-01 @ 9:00 am	2.5 ± 0.3	2017-12-04
7975880	STO	2017-11-28 @ 4:00 pm	2017-12-01 @ 9:00 am	0.7 ± 0.3	2017-12-04
7975861	VP	2017-11-28 @ 4:00 pm	2017-12-01 @ 9:00 am	1.6 ± 0.3	2017-12-04
7975847	WORK ROOM	2017-11-28 @ 4:00 pm	2017-12-01 @ 9:00 am	1.6 ± 0.3	2017-12-04

---

December 21, 2017

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

---

Radon test result report for:

**HIGHLAND ES  
MAIN**

---

Kit #	Room Id	Started	Ended	pCi/L	Analyzed
7975886	COM	@	@		

---

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 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

---

December 19, 2017

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

---

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).**

---

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

---

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: Highland Elementary School

Date of Test Report:	10/19/2016
Round of Testing:	Initial Follow-up Post Remediation
# Rooms Tested:	35
# Rooms $\geq$ 4.0 pCi/L:	0
Low Value:	< 0.3
High Value:	2.8

### Project Status:

Follow-up testing after HVAC update 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

October 19, 2016

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

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

Location: Highland Elementary School  
3100 Medway Street  
Silver Spring, MD 20902

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 Highland Elementary School, located at 3100 Medway Street in Silver Spring, Maryland 20902 (subject site).

**Scope of Services:**

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

KCI visited the site on September 26, 2016 and deployed thirty-nine (39) activated charcoal (AC) radon test kits. KCI deployed radon test kits in frequently-occupied ground contact rooms, and other areas, (if applicable) in accordance with AARST guidance. A floor plan map of the building with the test locations is included as Attachment A of this report.

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

KCI returned to the site on September 29, 2016 to retrieve the radon sampling test kits. KCI shipped all radon tests via overnight delivery to Airchek, Inc. for analysis by gamma-ray spectroscopy. Airchek, Inc. is a NRSB certified analytical laboratory for radon analysis (certification # ARL1402) located at 1936 Butler Bridge Road, Mills River, North Carolina.

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

These tests represent:

- Follow-up sampling of a school that had HVAC modifications over the summer.

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

- Determine if the HVAC project changed previously detected radon levels.

Future periodic testing should be conducted during the heating season in ideal conditions as described below. According to AARST, *Protocol for Conducting Measurements of Radon and Radon Decay Products in Schools and Large Buildings*, ideal testing conditions would be when the building is fully occupied and the heating system is active. For this test, the facility's HVAC system was operating in cooling mode; therefore, KCI concludes that this test was not conducted during ideal testing conditions.

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

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

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

### **Results:**

The results of the radon test analysis indicated the following:

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

Notes:

D- Duplicate sample

The field blank, 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

Radon Testing Results		
Highland Elementary School		
Test Period: 09/26/16-09/29/16		
Kit Number	Room / Area	Result
7802405	8	1.7
7802454	9	1.6
7802417	8A	1.5
7802432	8B	1.4
7802431	8C	0.9
7802498	9A	1.1
7802428	9B	1.1
7802453	* 9C (Tampered)	1.0
7802458	CONFERENCE	2.8
7802408	COUNSELOR	0.6
7802493	COUNSELOR 2	2.2
7802495	CR1	0.8
7802468	CR2	1.0
7802467	CR3	1.4
7802471	CR4	1.4
7802472	CR5	1.7
7802481	CR6	2.5
7802451	CR7	2.4
7802494	H104	1.3
7802466	H107	1.2
7802402	H109	0.8
7802427	H110	< 0.3
7802414	H111	< 0.3
7802439	H113	0.6
7802401	H117	< 0.3
7802435	H118	0.8
7802418	H119	0.9
7802438	H120	0.5
7802456	MAIN OFFICE	2.1
7802411	PARA OFFICE	0.8
7802464	PRINCIPAL OFFICE	1.3
7802455	STAFF LOUNGE	1.2
7802465	VICE PRINCIPAL	1.2
7802463	WORK RM 1	2.7
7802410	WORK RM 2	1.7

Table Note:

\* Missing or Compromised Sample

Radon Testing Results		
Highland Elementary School		
Test Period: 09/26/16-09/29/16		
Kit Number	QC Type	Result
7802412	* D (9:Tampered)	1.7
7802480	D (CR3)	1.0
7802457	D (MAIN OFFICE)	1.9
7802497	FB (CR3)	< 0.3

Table Note:

\* Missing or Compromised Sample

## ATTACHMENT C

### Laboratory Analytical Results

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

Kit #	Room Id	Started	Ended	pCi/L	Analyzed
7802405	8	2016-09-26 @ 2:00 pm	2016-09-29 @ 10:00 am	1.7 ± 0.3	2016-10-03
7802417	8A	2016-09-26 @ 2:00 pm	2016-09-29 @ 10:00 am	1.5 ± 0.3	2016-10-03
7802432	8B	2016-09-26 @ 2:00 pm	2016-09-29 @ 10:00 am	1.4 ± 0.3	2016-10-03
7802431	8C	2016-09-26 @ 2:00 pm	2016-09-29 @ 10:00 am	0.9 ± 0.3	2016-10-03
7802454	9	2016-09-26 @ 2:00 pm	2016-09-29 @ 10:00 am	1.6 ± 0.3	2016-10-03
7802412	9	2016-09-26 @ 2:00 pm	2016-09-29 @ 10:00 am	1.7 ± 0.3	2016-10-03
7802498	9A	2016-09-26 @ 2:00 pm	2016-09-29 @ 10:00 am	1.1 ± 0.3	2016-10-03
7802428	9B	2016-09-26 @ 2:00 pm	2016-09-29 @ 10:00 am	1.1 ± 0.3	2016-10-03
7802453	9C	2016-09-26 @ 2:00 pm	2016-09-29 @ 10:00 am	1.0 ± 0.3	2016-10-03
7802458	CONFERENCE	2016-09-26 @ 2:00 pm	2016-09-29 @ 10:00 am	2.8 ± 0.3	2016-10-03
7802408	COUNSELOR	2016-09-26 @ 2:00 pm	2016-09-29 @ 10:00 am	0.6 ± 0.3	2016-10-03
7802493	COUNSELOR 2	2016-09-26 @ 2:00 pm	2016-09-29 @ 10:00 am	2.2 ± 0.3	2016-10-03
7802495	CR1	2016-09-26 @ 3:00 pm	2016-09-29 @ 10:00 am	0.8 ± 0.3	2016-10-03
7802468	CR2	2016-09-26 @ 3:00 pm	2016-09-29 @ 10:00 am	1.0 ± 0.3	2016-10-03
7802497	CR3	2016-09-26 @ 3:00 pm	2016-09-29 @ 10:00 am	< 0.3	2016-10-03
7802480	CR3	2016-09-26 @ 3:00 pm	2016-09-29 @ 10:00 am	1.0 ± 0.3	2016-10-03
7802467	CR3	2016-09-26 @ 3:00 pm	2016-09-29 @ 10:00 am	1.4 ± 0.3	2016-10-03
7802471	CR4	2016-09-26 @ 3:00 pm	2016-09-29 @ 10:00 am	1.4 ± 0.3	2016-10-03
7802472	CR5	2016-09-26 @ 3:00 pm	2016-09-29 @ 10:00 am	1.7 ± 0.3	2016-10-03
7802481	CR6	2016-09-26 @ 3:00 pm	2016-09-29 @ 10:00 am	2.5 ± 0.3	2016-10-03
7802451	CR7	2016-09-26 @ 3:00 pm	2016-09-29 @ 10:00 am	2.4 ± 0.3	2016-10-03
7802494	H104	2016-09-26 @ 2:00 pm	2016-09-29 @ 10:00 am	1.3 ± 0.3	2016-10-03
7802466	H107	2016-09-26 @ 2:00 pm	2016-09-29 @ 10:00 am	1.2 ± 0.3	2016-10-03
7802402	H109	2016-09-26 @ 2:00 pm	2016-09-29 @ 10:00 am	0.8 ± 0.3	2016-10-03
7802427	H110	2016-09-26 @ 2:00 pm	2016-09-29 @ 11:00 am	< 0.3	2016-10-03
7802414	H111	2016-09-26 @ 2:00 pm	2016-09-29 @ 10:00 am	< 0.3	2016-10-03
7802439	H113	2016-09-26 @ 2:00 pm	2016-09-29 @ 10:00 am	0.6 ± 0.3	2016-10-03
7802401	H117	2016-09-26 @ 2:00 pm	2016-09-29 @ 10:00 am	< 0.3	2016-10-03
7802435	H118	2016-09-26 @ 2:00 pm	2016-09-29 @ 11:00 am	0.8 ± 0.3	2016-10-03
7802418	H119	2016-09-26 @ 2:00 pm	2016-09-29 @ 11:00 am	0.9 ± 0.3	2016-10-03
7802438	H120	2016-09-26 @ 2:00 pm	2016-09-29 @ 11:00 am	0.5 ± 0.3	2016-10-03
7802456	MAIN OFFICE	2016-09-26 @ 1:00 pm	2016-09-29 @ 10:00 am	2.1 ± 0.3	2016-10-03
7802457	MAIN OFFICE	2016-09-26 @ 1:00 pm	2016-09-29 @ 10:00 am	1.9 ± 0.3	2016-10-03
7802411	PARA OFFICE	2016-09-26 @ 2:00 pm	2016-09-29 @ 10:00 am	0.8 ± 0.3	2016-10-03
7802464	PRINCIPAL OFFICE	2016-09-26 @ 2:00 pm	2016-09-29 @ 10:00 am	1.3 ± 0.3	2016-10-03
7802455	STAFF LOUNGE	2016-09-26 @ 2:00 pm	2016-09-29 @ 10:00 am	1.2 ± 0.3	2016-10-03
7802465	VICE PRINCIPAL	2016-09-26 @ 1:00 pm	2016-09-29 @ 10:00 am	1.2 ± 0.3	2016-10-03

---

October 7, 2016

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

---

Radon test result report for:

**HIGHLAND ELEMENTARY SCHOOL  
MAIN**

---

<b>Kit #</b>	<b>Room Id</b>	<b>Started</b>	<b>Ended</b>	<b>pCi/L</b>	<b>Analyzed</b>
7802463	WORK RM 1	2016-09-26 @ 1:00 pm	2016-09-29 @ 10:00 am	2.7 ± 0.3	2016-10-03
7802410	WORK RM 2	2016-09-26 @ 2:00 pm	2016-09-29 @ 10:00 am	1.7 ± 0.3	2016-10-03

---

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



---

October 7, 2016

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

---

Radon test result report for:

**MCPS Radon**

**Phase 18 Office Blanks**

---

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

---

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

---

October 7, 2016

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

---

Radon test result report for:

**MCPS Radon**

**Phase 18 Transit Blanks**

---

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

---

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

---

October 12, 2016

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

---

Radon test result report for:

**MCPS Radon**

**Spike Sample Results**

---

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

---

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

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

# EXPOSURE IN BOWSER-MORNER RADON CHAMBER

CLIENT KCI Technologies Inc. Job Number 176788

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

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

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

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

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

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

F3 Left

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

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

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

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

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

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

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



## Radon Test Kit Chain of Custody

Project Name: MCPS Radon Phase 18

Name of Schools:

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

---

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

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



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 Phase 18

Name of Schools:

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

---

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

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



## MCPS RADON TESTING

### Executive Summary: Highland Elementary School

Date of Test Report:	2/23/2016 (Rev 2)
Round of Testing:	Initial Follow-up Post Remediation
# Rooms Tested:	70
# Rooms $\geq$ 4.0 pCi/L:	0
Low Value:	< 0.3
High Value:	3.2

### Project Status:

Initial testing completed; no further action at this time.



February 23, 2016 (Rev 2)

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

Re: **Radon Testing Services**  
KCI Job # 12146341.19

Location: Highland Elementary School  
3100 Medway Street  
Silver Spring, MD 20902

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 Highland Elementary School, located at 3100 Medway Street in Silver Spring, Maryland 20902 (subject site).

**Scope of Services:**

KCI conducted radon testing at the subject site to evaluate indoor radon levels relative to the USEPA's recommended action level of 4.0 picocuries per Liter (pCi/L) - the level at which EPA recommends that schools take action to reduce the level. KCI conducted the radon testing in accordance with American Association of Radon Scientists and Technologists (AARST) *Protocol for Conducting Measurements of Radon and Radon Decay Products in Schools and Large Buildings*. A National Radon 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 15, 2016 and deployed eighty-eight (88) activated charcoal (AC) radon test kits. KCI deployed radon test kits in frequently-occupied ground contact rooms, and other areas, (if applicable) in accordance with AARST guidance. A floor plan map of the building with the test locations is included as Attachment A of this report.

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

KCI returned to the site on December 18, 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>	none	n/a
<b><math>&lt; 4.0</math> pCi/L</b>	See Attachment B	

Notes:

D- Duplicate sample

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

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

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

Sincerely,



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

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

# ATTACHMENT A

## Floor Plan With Test Locations

## ATTACHMENT B

### Radon Test Summary Spreadsheet

**Table Notes:**

AC- Activated Charcoal

ACI- Air Chek, Inc.

D- Duplicate

FB- Field Blank

KCI- KCI Technologies, Inc.

OB- Office Blank

PM- Project Manager

QC- Quality Control

Radon Testing Results		
Highland Elementary		
Test Period: 12/15/15-12/18/15		
Kit Number	Room / Area	Result
7708374	117	0.7
7708385	8A	2.1
7708349	8C	1.0
7708332	9B	0.9
7708380	APR	1.6
7706503	ART ROOM	1.1
7708383	CAC8	0.8
7708377	CAC9	1.3
7706514	COMM	1.4
7708387	COMPU LAB	1.2
7708378	CONF.	3.1
7708394	COUNSELOR	2.0
7708334	CR MU	1.3
7708367	CR1	0.7
7708350	CR10	1.8
7708323	CR11	2.5
7708364	CR12	2.3
7708358	CR13	3.2
7708320	CR14	2.2
7708308	CR14A	0.9
7708306	CR14C	0.8
7708311	CR15	0.5
7708307	CR16	0.6
7708313	CR17	< 0.3
7708321	CR18	< 0.3
7708309	CR19	< 0.3
7708370	CR2	0.9
7706528	CR20	< 0.3
7706527	CR21	0.9
7708360	CR22	1.4
7708315	CR23	1.3
7708357	CR24	1.4
7708319	CR25	1.0
7708310	CR26	2.1
7708352	CR27	1.4
7708384	CR28	1.2
7708305	CR29	2.8
7708362	CR3	0.5
7708325	CR30	0.8
7708398	CR4	0.5
7708368	CR5	< 0.3
7708400	CR6	2.2
7708369	CR7	0.8
7708316	GAITA SPEC ED	0.7
7706502	GYM	2.4
7708322	GYM	2.4

Table Note:

\* Missing or Compromised Sample

Radon Testing Results		
Highland Elementary		
Test Period: 12/15/15-12/18/15		
Kit Number	Room / Area	Result
7708333	GYM	1.6
7708372	H102	0.6
7708393	H107	0.9
7708337	H110	< 0.3
7708302	H111	< 0.3
7708379	H113	< 0.3
7708375	H118	0.5
7708376	H119	< 0.3
7708381	H120	0.5
7708397	H123	< 0.3
7706504	IMC	2.8
7706501	IMC	2.2
7708330	MAIN OFF SUIT B	2.4
7708327	MAIN OFFICE	2.0
7708342	MPR	1.8
7708344	MPR	1.9
7708348	PRINCIPAL	1.9
7708382	SCH COUN.	1.2
7708331	SL1	1.2
7708329	SL2	1.5
7708336	SOAR	1.4
7708396	SPEC ED	1.2
7708373	SPEC ED 9A	1.1
7708301	SPEC ED MATH	1.4
7708371	SR-1	< 0.3
7708395	SR-2	1.0
7708363	VICE PRINCIPAL	2.1
7708353	WORK ROOM	1.8

Table Note:

\* Missing or Compromised Sample

Radon Testing Results		
Highland Elementary		
Test Period: 12/15/15-12/18/15		
Kit Number	QC Type	Result
7708339	D (CAC8)	1.3
7708361	D (CR1)	0.6
7708366	D (CR1)	< 0.3
7708355	D (CR13)	3.0
7708326	D (CR14)	2.2
7708399	D (CR2)	0.5
7708324	D (CR21)	0.8
7708388	D (CR24)	< 0.3
7708354	D (CR26)	1.8
7708347	D (CR28)	1.2
7708343	FB (8A)	< 0.3
7706519	FB (CR15)	< 0.3
7708303	FB (CR27)	< 0.3
7708205	OB (OFFICE BLANK)	< 0.3

Table Note:

\* Missing or Compromised Sample



## ATTACHMENT C

### Laboratory Analytical Results

Radon test result report for:  
**HIGHLAND ELEMENTARY**  
**1**

Kit #	Room Id	Started	Ended	pCi/L	Analyzed
7708374	117	2015-12-15 @ 5:00 pm	2015-12-18 @ 9:00 am	0.7 ± 0.3	2015-12-22
7708385	8A	2015-12-15 @ 5:00 pm	2015-12-18 @ 9:00 am	2.1 ± 0.3	2015-12-22
7708343	8A	2015-12-15 @ 5:00 pm	2015-12-18 @ 9:00 am	< 0.3	2015-12-22
7708349	8C	2015-12-15 @ 5:00 pm	2015-12-18 @ 9:00 am	1.0 ± 0.3	2015-12-22
7708332	9B	2015-12-15 @ 5:00 pm	2015-12-18 @ 9:00 am	0.9 ± 0.3	2015-12-22
7708380	APR	2015-12-15 @ 6:00 pm	2015-12-18 @ 9:00 am	1.6 ± 0.3	2015-12-22
7706503	ART ROOM	2015-12-15 @ 6:00 pm	2015-12-18 @ 10:00 am	1.1 ± 0.3	2015-12-22
7708383	CAC8	2015-12-15 @ 5:00 pm	2015-12-18 @ 9:00 am	0.8 ± 0.3	2015-12-22
7708339	CAC8	2015-12-15 @ 5:00 pm	2015-12-18 @ 9:00 am	1.3 ± 0.3	2015-12-22
7708377	CAC9	2015-12-15 @ 5:00 pm	2015-12-18 @ 9:00 am	1.3 ± 0.3	2015-12-22
7706514	COMM	2015-12-15 @ 6:00 pm	2015-12-18 @ 10:00 am	1.4 ± 0.3	2015-12-22
7708387	COMPU LAB	2015-12-15 @ 6:00 pm	2015-12-18 @ 10:00 am	1.2 ± 0.3	2015-12-22
7708378	CONFERENCE	2015-12-15 @ 5:00 pm	2015-12-18 @ 9:00 am	3.1 ± 0.4	2015-12-22
7708394	COUNSELOR	2015-12-15 @ 5:00 pm	2015-12-18 @ 9:00 am	2.0 ± 0.3	2015-12-22
7708334	CR MU	2015-12-15 @ 6:00 pm	2015-12-18 @ 10:00 am	1.3 ± 0.3	2015-12-22
7708361	CR1	2015-12-15 @ 4:00 pm	2015-12-18 @ 8:00 am	0.6 ± 0.3	2015-12-22
7708366	CR1	2015-12-15 @ 4:00 pm	2015-12-18 @ 8:00 am	< 0.3	2015-12-22
7708367	CR1	2015-12-15 @ 4:00 pm	2015-12-18 @ 8:00 am	0.7 ± 0.3	2015-12-22
7708350	CR10	2015-12-15 @ 6:00 pm	2015-12-18 @ 10:00 am	1.8 ± 0.4	2015-12-22
7708323	CR11	2015-12-15 @ 6:00 pm	2015-12-18 @ 10:00 am	2.5 ± 0.4	2015-12-22
7708364	CR12	2015-12-15 @ 6:00 pm	2015-12-18 @ 10:00 am	2.3 ± 0.3	2015-12-22
7708355	CR13	2015-12-15 @ 7:00 pm	2015-12-18 @ 10:00 am	3.0 ± 0.4	2015-12-22
7708358	CR13	2015-12-15 @ 6:00 pm	2015-12-18 @ 10:00 am	3.2 ± 0.4	2015-12-22
7708320	CR14	2015-12-15 @ 6:00 pm	2015-12-18 @ 10:00 am	2.2 ± 0.4	2015-12-22
7708326	CR14	2015-12-15 @ 6:00 pm	2015-12-18 @ 10:00 am	2.2 ± 0.3	2015-12-22
7708308	CR14A	2015-12-15 @ 6:00 pm	2015-12-18 @ 10:00 am	0.9 ± 0.3	2015-12-22
7708306	CR14C	2015-12-15 @ 6:00 pm	2015-12-18 @ 10:00 am	0.8 ± 0.3	2015-12-22
7708311	CR15	2015-12-15 @ 6:00 pm	2015-12-18 @ 10:00 am	0.5 ± 0.3	2015-12-22
7706519	CR15	2015-12-15 @ 6:00 pm	2015-12-18 @ 10:00 am	< 0.3	2015-12-22
7708307	CR16	2015-12-15 @ 6:00 pm	2015-12-18 @ 10:00 am	0.6 ± 0.3	2015-12-22
7708313	CR17	2015-12-15 @ 6:00 pm	2015-12-18 @ 10:00 am	< 0.3	2015-12-22
7708321	CR18	2015-12-15 @ 6:00 pm	2015-12-18 @ 10:00 am	< 0.3	2015-12-22
7708309	CR19	2015-12-15 @ 6:00 pm	2015-12-18 @ 10:00 am	< 0.3	2015-12-22
7708370	CR2	2015-12-15 @ 4:00 pm	2015-12-18 @ 9:00 am	0.9 ± 0.3	2015-12-22
7708399	CR2	2015-12-15 @ 4:00 pm	2015-12-18 @ 9:00 am	0.5 ± 0.3	2015-12-22
7706528	CR20	2015-12-15 @ 6:00 pm	2015-12-18 @ 10:00 am	< 0.3	2015-12-22
7708324	CR21	2015-12-15 @ 6:00 pm	2015-12-18 @ 10:00 am	0.8 ± 0.3	2015-12-22

December 30, 2015

# LABORATORY ANALYSIS REPORT \*\*

Radon test result report for:  
**HIGHLAND ELEMENTARY**  
**1**

Kit #	Room Id	Started	Ended	pCi/L	Analyzed
7706527	CR21	2015-12-15 @ 6:00 pm	2015-12-18 @ 10:00 am	0.9 ± 0.3	2015-12-22
7708360	CR22	2015-12-15 @ 7:00 pm	2015-12-18 @ 10:00 am	1.4 ± 0.3	2015-12-22
7708315	CR23	2015-12-15 @ 7:00 pm	2015-12-18 @ 10:00 am	1.3 ± 0.3	2015-12-22
7708357	CR24	2015-12-15 @ 7:00 pm	2015-12-18 @ 10:00 am	1.4 ± 0.3	2015-12-22
7708388	CR24	2015-12-15 @ 7:00 pm	2015-12-18 @ 10:00 am	< 0.3	2015-12-22
7708319	CR25	2015-12-15 @ 7:00 pm	2015-12-18 @ 10:00 am	1.0 ± 0.3	2015-12-22
7708310	CR26	2015-12-15 @ 7:00 pm	2015-12-18 @ 10:00 am	2.1 ± 0.3	2015-12-22
7708354	CR26	2015-12-15 @ 7:00 pm	2015-12-18 @ 10:00 am	1.8 ± 0.3	2015-12-22
7708303	CR27	2015-12-15 @ 7:00 pm	2015-12-18 @ 11:00 am	< 0.3	2015-12-22
7708352	CR27	2015-12-15 @ 7:00 pm	2015-12-18 @ 11:00 am	1.4 ± 0.3	2015-12-22
7708384	CR28	2015-12-15 @ 7:00 pm	2015-12-18 @ 10:00 am	1.2 ± 0.3	2015-12-22
7708347	CR28	2015-12-15 @ 7:00 pm	2015-12-18 @ 10:00 am	1.2 ± 0.3	2015-12-22
7708305	CR29	2015-12-15 @ 6:00 pm	2015-12-18 @ 10:00 am	2.8 ± 0.4	2015-12-22
7708362	CR3	2015-12-15 @ 4:00 pm	2015-12-18 @ 9:00 am	0.5 ± 0.3	2015-12-22
7708325	CR30	2015-12-15 @ 6:00 pm	2015-12-18 @ 10:00 am	0.8 ± 0.3	2015-12-22
7708398	CR4	2015-12-15 @ 4:00 pm	2015-12-18 @ 9:00 am	0.5 ± 0.3	2015-12-22
7708368	CR5	2015-12-15 @ 4:00 pm	2015-12-18 @ 9:00 am	< 0.3	2015-12-22
7708400	CR6	2015-12-15 @ 4:00 pm	2015-12-18 @ 9:00 am	2.2 ± 0.4	2015-12-22
7708369	CR7	2015-12-15 @ 4:00 pm	2015-12-18 @ 9:00 am	0.8 ± 0.3	2015-12-22
7708316	GAITA SPEC ED	2015-12-15 @ 6:00 pm	2015-12-18 @ 10:00 am	0.7 ± 0.3	2015-12-22
7708322	GYM	2015-12-15 @ 6:00 pm	2015-12-18 @ 10:00 am	2.4 ± 0.4	2015-12-22
7708333	GYM	2015-12-15 @ 6:00 pm	2015-12-18 @ 10:00 am	1.6 ± 0.3	2015-12-22
7706502	GYM	2015-12-15 @ 6:00 pm	2015-12-18 @ 10:00 am	2.4 ± 0.4	2015-12-22
7708372	H102	2015-12-15 @ 4:00 pm	2015-12-18 @ 9:00 am	0.6 ± 0.3	2015-12-22
7708393	H107	2015-12-15 @ 5:00 pm	2015-12-18 @ 9:00 am	0.9 ± 0.3	2015-12-22
7708337	H110	2015-12-15 @ 5:00 pm	2015-12-18 @ 9:00 am	< 0.3	2015-12-22
7708302	H111	2015-12-15 @ 5:00 pm	2015-12-18 @ 10:00 am	< 0.3	2015-12-22
7708379	H113	2015-12-15 @ 5:00 pm	2015-12-18 @ 10:00 am	< 0.3	2015-12-22
7708375	H118	2015-12-15 @ 5:00 pm	2015-12-18 @ 9:00 am	0.5 ± 0.3	2015-12-22
7708376	H119	2015-12-15 @ 5:00 pm	2015-12-18 @ 9:00 am	< 0.3	2015-12-22
7708381	H120	2015-12-15 @ 5:00 pm	2015-12-18 @ 9:00 am	0.5 ± 0.3	2015-12-22
7708397	H123	2015-12-15 @ 5:00 pm	2015-12-18 @ 9:00 am	< 0.3	2015-12-22
7706501	IMC	2015-12-15 @ 6:00 pm	2015-12-18 @ 10:00 am	2.2 ± 0.4	2015-12-22
7706504	IMC	2015-12-15 @ 6:00 pm	2015-12-18 @ 10:00 am	2.8 ± 0.4	2015-12-22
7708330	MAIN OFF SUIT B	2015-12-15 @ 5:00 pm	2015-12-18 @ 9:00 am	2.4 ± 0.4	2015-12-22
7708327	MAIN OFFICE	2015-12-15 @ 5:00 pm	2015-12-18 @ 9:00 am	2.0 ± 0.3	2015-12-22
7708342	MPR	2015-12-15 @ 6:00 pm	2015-12-18 @ 9:00 am	1.8 ± 0.4	2015-12-22

December  
30,  
2015

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

Radon test result report for:

**HIGHLAND ELEMENTARY**

**1**

Kit #	Room Id	Started	Ended	pCi/L	Analyzed
7708344	MPR	2015-12-15 @ 6:00 pm	2015-12-18 @ 9:00 am	1.9 ± 0.3	2015-12-22
7708348	PRINCIPAL	2015-12-15 @ 5:00 pm	2015-12-18 @ 9:00 am	1.9 ± 0.4	2015-12-22
7708382	SCH COUNSELOR	2015-12-15 @ 6:00 pm	2015-12-18 @ 10:00 am	1.2 ± 0.3	2015-12-22
7708331	SL1	2015-12-15 @ 6:00 pm	2015-12-18 @ 10:00 am	1.2 ± 0.3	2015-12-22
7708329	SL2	2015-12-15 @ 6:00 pm	2015-12-18 @ 10:00 am	1.5 ± 0.4	2015-12-22
7708336	SOAR	2015-12-15 @ 6:00 pm	2015-12-18 @ 10:00 am	1.4 ± 0.3	2015-12-22
7708396	SPEC ED	2015-12-15 @ 5:00 pm	2015-12-18 @ 9:00 am	1.2 ± 0.3	2015-12-22
7708373	SPEC ED 9A	2015-12-15 @ 6:00 pm	2015-12-18 @ 9:00 am	1.1 ± 0.3	2015-12-22
7708301	SPEC ED MATH	2015-12-15 @ 6:00 pm	2015-12-18 @ 9:00 am	1.4 ± 0.3	2015-12-22
7708371	SR-1	2015-12-15 @ 4:00 pm	2015-12-18 @ 9:00 am	< 0.3	2015-12-22
7708395	SR-2	2015-12-15 @ 4:00 pm	2015-12-18 @ 10:00 am	1.0 ± 0.3	2015-12-22
7708363	VICE PRINCIPAL	2015-12-15 @ 5:00 pm	2015-12-18 @ 9:00 am	2.1 ± 0.4	2015-12-22
7708353	WORK ROOM	2015-12-15 @ 5:00 pm	2015-12-18 @ 9:00 am	1.8 ± 0.3	2015-12-22

December  
30,  
2015

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

Radon test result report for:

**HIGHLAND ELEMENTARY  
OFFICE BLANK**

Kit #	Room Id	Started	Ended	pCi/L	Analyzed
7708205	OFFICE BLANK	2015-12-15 @ 3:00 pm	2015-12-18 @ 3:00 pm	< 0.3	2015-12-22

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

December  
29,  
2015

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

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

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

December  
23,  
2015

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

Spike Sample Laboratory Results

Radon test result report for:  
**MCPS**

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

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

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

# EXPOSURE IN BOWSER-MORNER RADON CHAMBER

CLIENT KCI Technologies Inc. Job Number 173224

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

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

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

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

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

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

F3 Left

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

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

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

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

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

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

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





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

## Radon Test Kit Chain of Custody

Project Name: MCPS Radon Phase I

Name of Schools:

- |                            |                        |                        |                       |
|----------------------------|------------------------|------------------------|-----------------------|
| 1. Westland M.S.           | 6. South Lake E.S.     | 11. Highland View E.S. | 16. Ridgeview M.S.    |
| 2. East Silver Spring E.S. | 7. Jones Lane E.S.     | 12. Cresthaven E.S.    | 17. Rockwell E.S.     |
| 3. Oakland Terrace E.S.    | 8. Quince Orchard H.S. | 13. Viers Mill E.S.    | 18. Oak View E.S.     |
| 4. Rocking Horse Road E.S. | 9. Damascus E.S.       | 14. Smith Center       | 19. Jackson Road E.S. |
| 5. Beall E.S.              | 10. Westbrooke E.S.    | 15. Rosemont E.S.      | 20. Highland E.S.     |
|                            |                        |                        | 21. Watkins Mill E.S. |

---

	Date	Initials
Radon Test Kits Deployed	12/15/15	KM
Radon Test Kits Collected	12/18/15	KM
Radon Test Kits Shipped to Lab*	12/18/15	KM
Radon Test Kits Received by Lab*	12/22/15	KM

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

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

November 30, 2015

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

Re: Radon Evaluation- Highland Elementary School

Dear Mr. Yarup:

Environmental radon testing has been completed at Highland Elementary School.

A charcoal canister was placed in the gym of school as a follow-up to a previously completed survey. The canister was placed on November 13, 2015 and retrieved on November 16, 2015. The detected radon concentration (2.8) was below the EPA recommended level of 4.0 pico curries per liter (pCi/l) of air.

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

Sincerely,

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

# A.B.E. Radiation Measurements Laboratory

Division of Health Physics Associates, Inc.

1005 Old 22 PO Box 214 Lenhartsville, PA 19534

dee@radprotection.com

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

November 24, 2015

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

Attn: Kimberly Tayman

re: **Radon Sampling**, Highland Elementary School,  
3100 Medway St., Silver Spring, MD 20902.

**Dates of tests:** November 13 to 16, 2015

**Chamber Spikes:** 2.9 % Deviation; September 19 to 21, 2015

Dear Ms. Tayman:

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

<b>Canister Number</b>	<b>Location</b>	<b>Start Time</b>	<b>End Time</b>	<b>pCi/l</b>
172523	Gym	15:08	08:33	2.8

## CONCLUSIONS

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

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

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

Thank you for the opportunity to serve you.

Sincerely,



A. LaMastra  
President