School / Facility Radon Testing Report Form

Instructions: *Submit one testing report form per-facility per-round of testing. 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 ≥2.0-pCi/L; ≥2.7-pCi/L; ≥4.0-pCi/L; and ≥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.

School Year: **23-24**

Facility:	Westbrook Elementary School
Address:	5110 Allan Terrace
	Bethesda, MD 20816

Reason for Testing:	☒ Scheduled Re-Testing (2 or 5-year schedule) ☐ Clearance Testing (Post-Mitigation) ☐ System(s) Performance Testing (Post-Mitigation) ☐ New Construction/Facility
Facility Current Radon Status:	☐ Active Mitigation (2-year regular schedule) ☒ No Active Mitigation (5-year regular schedule) ☐ Not Previously Tested
Round of Testing:	☒ Initial Testing **-or-** ☐ Follow-up Testing
Testing Status:	☒ No Further Testing Needed **-or-** ☐ Follow-Up Testing Required

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

Mitigation -	**Facility Radon Status:**
☒ Not Required or Considered ☐ Required (>8.0-pCi/L) ☐ Required (≥4.0-pCi/L) ☐ Consider (≥2.0 & <4.0-pCi/L)	☒ No Change in Status ☐ Active Mitigation (2-year regular schedule) ☐ No Active Mitigation (5-year regular schedule)

MCPS DEM SUSTAINABILITY & COMPLIANCE

School / Facility Radon Testing Report Form

Detector and Deployment

Detector/Device Type:	☒ Passive ☐ Continuous	☒ Charcoal Absorption (CAD) ☐ Alpha Track (ATD) ☐ Other ☐ Electret ion Chamber (EIC) ☐ 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
Shakia Dawkins	KCI Technologies, Inc.
If noncertified individuals, the qualified measurement professional providing oversight -	
Tyler McCleaf, CSP – Cert. #111004-RMP	KCI Technologies, Inc.

Testing

☒ Short-Term ☐ Long-Term	Length of Test (days):	3	Date of Deployment and Retrieval (mm/dd/yy):	01/22/24 01/25/24
Does the test period include weekends, school breaks or holidays?				☐ Yes ☒ No
*If "**Yes**" please explain/detail in the space below:*				
Was HVAC operating under occupied conditions?				☒ Yes ☐ No
*If "**No**" please explain/detail in the space below:*				

Testing (continued)

	Detectors Deployed		
	Ground-Contact	**Upper-Level(s)**	**Total**
Test Locations[1]	31	4	35
Duplicates[2]	2	1	3
Field Blanks[3]	2	0	1
		Grand Total	39

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.

Spike Samples[1]	6	Trip Blank(s)[2]	2	Office Blank(s)[3,4]	2

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.

Spike Sample Lab Results. Measured values are satisfactory, i.e., within ± 25% of the chamber's reference value.	☒ Yes ☐ No
Quality Control measurements comply with QA/QC requirements in the QA plan previously submitted?	☒ Yes ☐ No

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

*If "**No**" to either, please describe any QC measurements that were missing or outside of control tolerances established in the QAP here:*

Summary of Test Results[1] and Determination of Valid Measurements[2]

	Ground-Contact	Upper-Level(s)	Total
Number of test locations:	31	4	35
Number of locations ≥8.0-pCi/L:	0	0	0
Number of locations ≥4.0 and ≤8-pCi/L:	0	0	0
Number of locations ≥2.7 and ≤4-pCi/L:	0	0	0
Number of locations ≥2.0 and ≤4-pCi/L:	6	0	6
Number of missing required test locations[3]:	2	0	2
Percentage of missing test locations for the facility[4,5]:	6.5%	0	6.5%

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 ≥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;
5 – 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.

School / Facility Radon Testing Report Form

Summary of Test Results[1] and Determination of Valid Measurements[2] (continued)

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?	☐ Yes ☒ 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?	☐ Yes ☒ No
If Yes to both above *– then Testing Status –* ***'No Further Testing Needed'*** *mark 'NA' below and complete Conclusions section*	
If No to either above, were all results obtained under 4.0-pCi/L **and** were there sufficient valid measurements obtained?[1,2] ***If Yes*** *– then Testing Status -* ***'No Further Testing Needed'*** *complete Conclusion section* ***If No****, then Testing Status -* ***'Follow-up Testing Required'*** *continue below*	☒ Yes ☐ No ☐ 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.

- **If 'No Further Testing Needed'** complete conclusions section on first page.
- **If 'Follow-up Testing Required'** – complete Follow-up Testing described below and the conclusion section on the first page for only the valid measurements/results obtained

Follow-Up Testing (if required)

Required if –

1- Not enough valid results were obtained from a facility (table above);
2- Any results ≥ 4.0 – pCi/L; and
3- At the discretion of MCPS IAQ Staff

Follow-up Testing:

1- If an insufficient number of valid measurements obtained during initial round:
   - return to facility to test locations that require valid measurements
2- Follow-up Testing for valid measurements ≥ 4.0-pCi/L

Initial Result(s)	Procedure	Follow-up Result	Conclusion
≥ 4.0-pCi/L	1- Short-term follow-up test 2- Average the results of the two tests	≥4.0	Mitigation Required
		<4.0 but >2.0	Consider Mitigation
		<2.0	Not Required or Considered

- **Complete second School/Facility Radon Testing Report Form for only Follow-up Testing locations.**

Attachment 1:

Summary Data Tables

Table 1- Radon Testing Results		
Westbrook Elementary School		
Test Period: 01/22/2024 - 01/25/2024		
Kit Number	Room / Area	Result
11284323	103	1.4
11284314	104	1.0
11284307	105	1.4
11284310	105	1.4
11284312	106	1.2
11284324	111	< 0.3
11284318	114	< 0.3
11284322	115	0.7
11284301	117	< 0.3
11284303	120	< 0.3
11284302	121	0.5
11284325	137	1.5
11284311	204	1.1
11284309	205	1.9
11284308	207	1.1
11284305	209	1.9
11284328	210	1.9
11284306	211	0.9
11284319	211	0.8
11284339	302	1.5
11284329	200A	1.7
11284320	200A.1	1.4
11284327	200D	2.1
11284315	B06	0.7
11284316	B08	0.7
11284317	B09	0.6
11284313	B11	< 0.3
11284335	B14 GYM	< 0.3
11284336	B14 GYM	0.9
11284331	B14A	1.3
11284332	B14A	1.5
11284333	BS MANAGER	2.4
11284330	BS OFFICE	2.0
11284304	KITCHEN OFFICE	0.6
11284321	MAIN OFFICE 200	1.6
11284326	MPR	2.6
11284338	MPR	2.4
11284337	STAGE	2.6

Table 1- Radon Testing Results		
Westbrook Elementary School		
Test Period: 01/22/2024 - 01/25/2024		
11478087	104	0.7
11478095	302	<0.3

Table 2 - Summary Testing Results ≥2.0 pCi/L							
Westbrook Elementary School							
Test Period: 01/22/2024 - 01/25/2024							
≥2.0 and <2.7 pCi/L		≥2.7 and <4.0 pCi/L		≥4.0 and <8.0 pCi/l		≥8.0 pCi/L	
Room / Area	**Result**	**Room / Area**	**Result**	**Room / Area**	**Result**	**Room / Area**	**Result**
200D	2.1	N/A	N/A	N/A	N/A	N/A	N/A
BS MANAGER	2.4						
BS OFFICE	2.0						
MPR	2.6						
MPR	2.4						
STAGE	2.6						

Table 3 - QC Radon Testing Results			
Westbrook Elementary School			
Test Period: 01/22/2024 - 01/25/2024			
Kit Number	**QC Type**	**Room / Area**	**Result**
11284310	FB	105	1.4
11284319	D	211	0.8
11284331	D	B14A	1.3
11463686	OB	OFFICE BLANK	< 0.3
11463685	TB	TRAVEL BLANK	< 0.3
11478087	D	104	0.7
11478095	FB	302	<0.3

Table 4 - Summary of Invalid Measurement Locations		
Westbrook Elementary School		
Test Period: 01/22/24 - 01/25/24		
Kit Number	**Room/Area**	**Result**
N/A	116	Missed Location
N/A	100	Missed Location

Attachment 2:

Laboratory Reports

February 7, 2024

** LABORATORY ANALYSIS REPORT **

Radon test result report for:

Kit #	Room Id	Started	Ended	pCi/L	Analyzed
11284323	103	2024-01-22 @ 12:00 pm	2024-01-25 @ 11:00 am	1.4 ± 0.3	2024-01-29
11284314	104	2024-01-22 @ 12:00 pm	2024-01-25 @ 11:00 am	1.0 ± 0.3	2024-01-29
11284307	105	2024-01-22 @ 12:00 pm	2024-01-25 @ 11:00 am	1.4 ± 0.3	2024-01-29
11284310	105	2024-01-22 @ 12:00 pm	2024-01-25 @ 11:00 am	1.4 ± 0.3	2024-01-29
11284312	106	2024-01-22 @ 12:00 pm	2024-01-25 @ 11:00 am	1.2 ± 0.3	2024-01-29
11284324	111	2024-01-22 @ 12:00 pm	2024-01-25 @ 11:00 am	< 0.3	2024-01-29
11284318	114	2024-01-22 @ 12:00 pm	2024-01-25 @ 11:00 am	< 0.3	2024-01-29
11284322	115	2024-01-22 @ 12:00 pm	2024-01-25 @ 11:00 am	0.7 ± 0.3	2024-01-29
11284301	117	2024-01-22 @ 12:00 pm	2024-01-25 @ 11:00 am	< 0.3	2024-01-29
11284303	120	2024-01-22 @ 12:00 pm	2024-01-25 @ 11:00 am	< 0.3	2024-01-29
11284302	121	2024-01-22 @ 12:00 pm	2024-01-25 @ 11:00 am	0.5 ± 0.3	2024-01-29
11284325	137	2024-01-22 @ 1:00 pm	2024-01-25 @ 11:00 am	1.5 ± 0.4	2024-01-29
11284329	200A	2024-01-22 @ 12:00 pm	2024-01-25 @ 11:00 am	1.7 ± 0.3	2024-01-29
11284320	200A.1	2024-01-22 @ 12:00 pm	2024-01-25 @ 11:00 am	1.4 ± 0.3	2024-01-29
11284327	200D	2024-01-22 @ 12:00 pm	2024-01-25 @ 11:00 am	2.1 ± 0.4	2024-01-29
11284311	204	2024-01-22 @ 12:00 pm	2024-01-25 @ 11:00 am	1.1 ± 0.3	2024-01-29
11284309	205	2024-01-22 @ 12:00 pm	2024-01-25 @ 11:00 am	1.9 ± 0.4	2024-01-29
11284308	207	2024-01-22 @ 12:00 pm	2024-01-25 @ 11:00 am	1.1 ± 0.3	2024-01-29
11284305	209	2024-01-22 @ 12:00 pm	2024-01-25 @ 11:00 am	1.9 ± 0.4	2024-01-29
11284328	210	2024-01-22 @ 12:00 pm	2024-01-25 @ 11:00 am	1.9 ± 0.4	2024-01-29
11284319	211	2024-01-22 @ 12:00 pm	2024-01-25 @ 11:00 am	0.8 ± 0.3	2024-01-29
11284306	211	2024-01-22 @ 12:00 pm	2024-01-25 @ 11:00 am	0.9 ± 0.3	2024-01-29
11284339	302	2024-01-22 @ 1:00 pm	2024-01-25 @ 11:00 am	1.5 ± 0.4	2024-01-29
11284315	B06	2024-01-22 @ 12:00 pm	2024-01-25 @ 11:00 am	0.7 ± 0.3	2024-01-29
11284316	B08	2024-01-22 @ 12:00 pm	2024-01-25 @ 11:00 am	0.7 ± 0.3	2024-01-29
11284317	B09	2024-01-22 @ 12:00 pm	2024-01-25 @ 11:00 am	0.6 ± 0.3	2024-01-29
11284313	B11	2024-01-22 @ 12:00 pm	2024-01-25 @ 11:00 am	< 0.3	2024-01-29
11284335	B14 GYM	2024-01-22 @ 12:00 pm	2024-01-25 @ 11:00 am	< 0.3	2024-01-29
11284336	B14 GYM	2024-01-22 @ 12:00 pm	2024-01-25 @ 11:00 am	0.9 ± 0.3	2024-01-29
11284331	B14A	2024-01-22 @ 12:00 pm	2024-01-25 @ 11:00 am	1.3 ± 0.3	2024-01-29
11284332	B14A	2024-01-22 @ 12:00 pm	2024-01-25 @ 11:00 am	1.5 ± 0.4	2024-01-29
11284333	BS MANAGER	2024-01-22 @ 1:00 pm	2024-01-25 @ 11:00 am	2.4 ± 0.4	2024-01-29
11284330	BS OFFICE	2024-01-22 @ 1:00 pm	2024-01-25 @ 11:00 am	2.0 ± 0.4	2024-01-29
11284304	KITCHEN OFFICE	2024-01-22 @ 1:00 pm	2024-01-25 @ 11:00 am	0.6 ± 0.3	2024-01-29
11284321	MAIN OFFICE 200	2024-01-22 @ 11:00 am	2024-01-25 @ 11:00 am	1.6 ± 0.3	2024-01-29
11284326	MPR	2024-01-22 @ 1:00 pm	2024-01-25 @ 11:00 am	2.6 ± 0.4	2024-01-29
11284338	MPR	2024-01-22 @ 1:00 pm	2024-01-25 @ 11:00 am	2.4 ± 0.4	2024-01-29

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

February 7, 2024

** LABORATORY ANALYSIS REPORT **

Radon test result report for:

Kit #	Room Id	Started	Ended	pCi/L	Analyzed
11284337	STAGE	2024-01-22 @ 12:00 pm	2024-01-25 @ 11:00 am	2.6 ± 0.4	2024-01-29

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March 4, 2024

** LABORATORY ANALYSIS REPORT **

Radon test result report for:

Kit #	Room Id	Started	Ended	pCi/L	Analyzed
11478087	104	2024-02-26 @ 12:00 pm	2024-02-29 @ 11:00 am	0.7 ± 0.3	2024-03-04
11478095	302	2024-02-26 @ 12:00 pm	2024-02-29 @ 11:00 am	< 0.3	2024-03-04

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

January 30, 2024

** LABORATORY ANALYSIS REPORT **

Radon test result report for:
KCI
MAIN

Kit #	Room Id	Started	Ended	pCi/L	Analyzed
11463691	OB	2024-01-23 @ 8:00 am	2024-01-26 @ 2:00 pm	< 0.3	2024-01-30
11463647	TB	2024-01-23 @ 8:00 am	2024-01-26 @ 2:00 pm	< 0.3	2024-01-30

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

March 5, 2024

** LABORATORY ANALYSIS REPORT **

Radon test result report for:
KCI
MAIN

Kit #	Room Id	Started	Ended	pCi/L	Analyzed
11284001	OB	2024-02-26 @ 8:00 am	2024-02-29 @ 1:00 pm	< 0.3	2024-03-04
11482791	TB	2024-02-26 @ 8:00 am	2024-02-29 @ 1:00 pm	< 0.3	2024-03-04

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 213327

NOMINAL Conditions: Radon Conc 49.5 pCi/L Rel. Hum 24.7 % Temp. 69.8 F

Date Start: 1/19/24 Date Stop: 1/22/24	Date Start: _____ Date Stop: _____
Time Start: 0831 Time Stop: 0831	Time Start: _____ Time Stop: _____
Device No.'s: (6) CHAR BAGS -	Device No.'s: _____
11284003, 11284005, 11284006	_____
11284007, 11284008, 11284013	_____
F3 Left	
Date Start: _____ Date Stop: _____	Date Start: _____ Date Stop: _____
Time Start: _____ Time Stop: _____	Time Start: _____ Time Stop: _____
Device No.'s: _____	Device No.'s: _____
_____	_____
_____	_____
_____	_____
Date Start: _____ Date Stop: _____	Date Start: _____ Date Stop: _____
Time Start: _____ Time Stop: _____	Time Start: _____ Time Stop: _____
Device No.'s: _____	Device No.'s: _____
_____	_____
_____	_____
_____	_____

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

January 29, 2024 **** LABORATORY ANALYSIS REPORT ****

Radon test result report for:
BOWSER MORNER
MAIN

Kit #	Room Id	Started	Ended	pCi/L	Analyzed
11284003	SK	2024-01-19 @ 9:00 am	2024-01-22 @ 9:00 am	47.0 ± 3.8	2024-01-29
11284005	SK	2024-01-19 @ 9:00 am	2024-01-22 @ 9:00 am	43.4 ± 3.5	2024-01-29
11284006	SK	2024-01-19 @ 9:00 am	2024-01-22 @ 9:00 am	42.1 ± 3.4	2024-01-29
11284007	SK	2024-01-19 @ 9:00 am	2024-01-22 @ 9:00 am	46.4 ± 3.7	2024-01-29
11284008	SK	2024-01-19 @ 9:00 am	2024-01-22 @ 9:00 am	46.2 ± 3.7	2024-01-29
11284013	SK	2024-01-19 @ 9:00 am	2024-01-22 @ 9:00 am	45.6 ± 3.6	2024-01-29

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 213819

NOMINAL Conditions: Radon Conc 50.0 pCi/L Rel. Hum 28.9 % Temp. 69.1 F

Date Start: 2/23/24 Date Stop: 2/26/24

Time Start: 0812 Time Stop: 0812

Device No.'s: (6) CHAR BAGS

11478400, 11477842, 11477845,

11477852, 11477996, 11477999

E3 Left

Date Start: _____ Date Stop: _____

Time Start: _____ Time Stop: _____

Device No.'s: _____

Date Start: _____ Date Stop: _____

Time Start: _____ Time Stop: _____

Device No.'s: _____

Date Start: _____ Date Stop: _____

Time Start: _____ Time Stop: _____

Device No.'s: _____

Date Start: _____ Date Stop: _____

Time Start: _____ Time Stop: _____

Device No.'s: _____

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

March 1, 2024

** LABORATORY ANALYSIS REPORT **

Radon test result report for:
FEB SK
MAIN

Kit #	Room Id	Started	Ended	pCi/L	Analyzed
11477842	NA	2024-02-23 @ 8:00 am	2024-02-26 @ 8:00 am	50.3 ± 4.0	2024-03-01
11477845	NA	2024-02-23 @ 8:00 am	2024-02-26 @ 8:00 am	55.3 ± 4.4	2024-03-01
11477852	NA	2024-02-23 @ 8:00 am	2024-02-26 @ 8:00 am	49.4 ± 4.0	2024-03-01
11477996	NA	2024-02-23 @ 8:00 am	2024-02-26 @ 8:00 am	49.8 ± 4.0	2024-03-01
11477999	NA	2024-02-23 @ 8:00 am	2024-02-26 @ 8:00 am	55.4 ± 4.4	2024-03-01
11478400	NA	2024-02-23 @ 8:00 am	2024-02-26 @ 8:00 am	47.0 ± 3.8	2024-03-01

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

KCI TECHNOLOGIES

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 January 22nd to January 25th

Name of Schools:

1. Fields Road ES
2. Germantown ES
3. Highland View ES
4. Westbrook ES
5. John T. Baker MS
6. Herbert Hoover MS

	Date	Initials
Radon Test Kits Deployed	01/22/2024	BMM
Radon Test Kits Collected	01/25/2024	BMM
Radon Test Kits Shipped to Lab*	01/25/2024	BMM
Radon Test Kits Received by Lab*	01/29/2024	BMM

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

KCI TECHNOLOGIES

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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 February 26th & February 29th 2024

Name of Schools:

1. Blair G. Ewing Center
2. Radnor Center
3. Rosa M. Parks MS
4. Cabin Branch ES
5. Westbrook ES
6. Clopper Mill ES

	Date	Initials
Radon Test Kits Deployed	02/26/2024	
Radon Test Kits Collected	02/29/2024	
Radon Test Kits Shipped to Lab*	02/29/2024	
Radon Test Kits Received by Lab*	01/30/2024	

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

Attachment 3:

Sampling Location Map

KCI TECHNOLOGIES

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

MCPS RADON TESTING – EXECUTIVE SUMMARY

Site Name	Westbrook Elementary School
Date of Test Report	05/12/2022
Round of Testing	Initial Follow-up Post Remediation 2 Year Testing 5 Year Testing HVAC Upgrade Window Replacement New Addition New Facility
# Rooms Tested	3
# Rooms ≥ 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

KCI TECHNOLOGIES

ENGINEERS • PLANNERS • SCIENTISTS • CONSTRUCTION MANAGERS

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

May 12, 2022

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

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

Location: Westbrook Elementary School
5110 Allan Terrace
Bethesda, MD 20817

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 Westbrook Elementary School, located at 5110 Allan Terrace, Bethesda, MD 20817 (subject site).

Scope of Services:

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

KCI visited the site on March 21, 2022 and deployed six (6) activated charcoal (AC) radon test kits. KCI deployed radon test kits in all frequently-occupied ground contact rooms, and other areas, (if applicable) in accordance with AARST guidance.

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

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

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

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

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

Evaluation of Testing Conditions:

These tests represent:

- Follow-up to initial testing.

These tests were conducted to:

- Evaluate radon concentrations at the facility.

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

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

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

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

Results:

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

The results of the radon test analysis indicated the following:

Radon Concentration	Room	Result
≥4.0 piC/L	None	N/A
<4.0 piC/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 McCleaf

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
QC- Quality Control

Table 1- Radon Testing Results		
Westbrook ES RT		
Test Period: 03/21/2022 - 03/24/2022		
Kit Number	Room / Area	Result
11131725	225	< 0.3
11131703	B09	< 0.3
11131711	B09	< 0.3
11131724	B09	< 0.3
11131722	B14 GYM	< 0.3
11131730	B14 GYM	< 0.3

Table 2- Radon Testing Results			
Westbrook ES RT			
Test Period: 03/21/2022 - 03/24/2022			
Kit Number	QC Type	Room / Area	Result
11131703	D	B09	< 0.3
11131724	FB	B09	< 0.3
11139902	OB	OFFICE BLANK	< 0.3
11139928	TB	TRAVEL BLANK	< 0.3

Summary of Missed Locations		
Westbrook ES RT		
Test Period: 03/21/22 - 03/24/22		
Kit Number	Room/Area	Result
	NA	

Summary of Missing, Compromised and >/= 4 piC/L Tests		
Westbrook ES RT		
Test Period: 03/21/22 - 03/24/22		
Kit Number	Room/Area	Result
	NA	

Table Note:

* Missing or Compromised Sample

ATTACHMENT C

Laboratory Analytical Results

March 28, 2022

** LABORATORY ANALYSIS REPORT **

Radon test result report for:
WESTBROOK ES

Kit #	Room Id	Started	Ended	pCi/L	Analyzed
11131725	225	2022-03-21 @ 11:00 am	2022-03-24 @ 10:00 am	< 0.3	2022-03-28
11131724	B09	2022-03-21 @ 11:00 am	2022-03-24 @ 10:00 am	< 0.3	2022-03-28
11131711	B09	2022-03-21 @ 11:00 am	2022-03-24 @ 10:00 am	< 0.3	2022-03-28
11131703	B09	2022-03-21 @ 11:00 am	2022-03-24 @ 10:00 am	< 0.3	2022-03-28
11131730	B14 GYM	2022-03-21 @ 11:00 am	2022-03-24 @ 10:00 am	< 0.3	2022-03-28
11131722	B14 GYM	2022-03-21 @ 11:00 am	2022-03-24 @ 10:00 am	< 0.3	2022-03-28

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 Eight	_____
Date Start: _____ Date Stop: _____	Date Start: _____ Date Stop: _____
Time Start: _____ Time Stop: _____	Time Start: _____ Time Stop: _____
Device No.'s: _____	Device No.'s: _____
_____	_____
_____	_____
_____	_____
Date Start: _____ Date Stop: _____	Date Start: _____ Date Stop: _____
Time Start: _____ Time Stop: _____	Time Start: _____ Time Stop: _____
Device No.'s: _____	Device No.'s: _____
_____	_____
_____	_____
_____	_____

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

March 30, 2022

** LABORATORY ANALYSIS REPORT **

Radon test result report for:

MCPS - Spike Sample Lab Results. Measured values are satisfactory, i.e., within ± 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 ± 2.1	2022-03-30
11139368	SK2	2022-03-18 @ 7:00 am	2022-03-21 @ 7:00 am	23.9 ± 2.0	2022-03-30
11139371	SK3	2022-03-18 @ 7:00 am	2022-03-21 @ 7:00 am	25.7 ± 2.1	2022-03-30
11139710	SK4	2022-03-18 @ 7:00 am	2022-03-21 @ 7:00 am	26.4 ± 2.1	2022-03-30
11139717	SK5	2022-03-18 @ 7:00 am	2022-03-21 @ 7:00 am	24.6 ± 2.0	2022-03-30

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

KCI TECHNOLOGIES

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

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

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

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MCPS RADON TESTING – EXECUTIVE SUMMARY

Site Name	Westbrook Elementary School
Date of Test Report	2/21/2022
Round of Testing	Initial Follow-up Post Remediation 2 Year Testing 5 Year Testing HVAC Upgrade Window Replacement New Addition New Facility
# Rooms Tested	55
# Rooms ≥ 4.0 pCi/L	0
Lowest Value	<0.3 pCi/L
Highest Value	2.7 pCi/L

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

KCI TECHNOLOGIES

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

February 21, 2022

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

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

Location: Westbrook Elementary School
5110 Allan Terrace
Bethesda, MD 20816

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 Westbrook Elementary School, located at 5110 Allan Terrace Bethesda, MD 20816 (subject site).

Scope of Services:

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

KCI visited the site on January 19, 2022 and deployed sixty four (64) activated charcoal (AC) radon test kits. KCI deployed radon test kits in all frequently-occupied ground contact rooms, and other areas, (if applicable) in accordance with AARST guidance.

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

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

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

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

Evaluation of Testing Conditions:

These tests represent:

- Follow-up to post-mitigation biennial testing

These tests were conducted to:

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

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

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

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

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

Results:

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

The results of the radon test analysis indicated the following:

Radon Concentration	Room	Result
≥4.0 piC/L	None	N/A
<4.0 piC/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 McCleaf

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
QC- Quality Control

Table 1- Radon Testing Results		
Westbrook ES		
Test Period: 01/25/2022-01/28/2022		
Kit Number	Room / Area	Result
11105683	100	1.5
11105686	100	1.5
11105692	103	< 0.3
11105697	104	0.7
11105694	105	< 0.3
11105696	106	0.7
11107517	112	< 0.3
11105695	114	< 0.3
11107511	115	< 0.3
11107512	115	< 0.3
11107519	115	< 0.3
11105691	116	< 0.3
11107507	117	< 0.3
11105690	120	< 0.3
11107518	121	0.6
11105662	126	1.6
11105670	127	< 0.3
11105649	128	< 0.3
11105647	129	1.3
11105667	130	0.6
11105669	130	< 0.3
11105673	132	< 0.3
11105681	133	0.6
11105674	136	< 0.3
11105675	137	0.6
11105639	200	1.3
11105657	204	2.7
11105646	205	1.4
11105658	205	1.5
11105654	207	0.8
11105645	208	0.6
11105661	208	0.5
11105642	209	1.4
11105651	210	< 0.3
11105655	211	0.6
11105653	212	0.6
11105648	213	0.5
11105650	214	0.8
11105644	217	< 0.3
11105660	219	< 0.3
11105659	223	< 0.3
11105652	225	NA

Table 1- Radon Testing Results		
Westbrook ES		
Test Period: 01/25/2022-01/28/2022		
Kit Number	Room / Area	Result
11105663	225	< 0.3
11105664	225	< 0.3
11105643	229	< 0.3
11105665	231	< 0.3
11105627	232	< 0.3
11105666	234	1.0
11105699	302	0.8
11105641	200A	1.5
11105640	200D	1.1
11105628	208A	0.6
11105672	B06	< 0.3
11105678	B08	< 0.3
11105677	B09	NA
11105685	B09	< 0.3
11105680	B11	< 0.3
11105676	B14 A	1
11105671	B14 GYM	1
11105679	B14 GYM	NA
11105684	B17	1.2
11105688	B17	1.3
11105687	B18B	2.3
11105689	B18D	1.3

Table 2- Radon Testing Results			
Westbrook ES			
Test Period: 12/13/2021-12/16/2021			
Kit Number	QC Type	Room / Area	Result
11105658	D	205	1.5
11105663	D	225	< 0.3
11105664	FB	225	< 0.3
11105669	D	130	< 0.3
11105678	D	B08	< 0.3
11105677	FB	B09	NA
11105683	D	100	1.5
11107512	D	115	< 0.3
11107519	FB	115	< 0.3
11106126	OB	OFFICE BLANK	< 0.3
11105790	TB	TRAVEL Blank	< 0.3

Summary of Missed Locations		
Westbrook ES		
Test Period: 01/25/22 - 01/28/22		
Kit Number	Room/Area	Result
	NA	

Summary of Missing, Compromised and >/= 4 piC/L Tests		
Westbrook ES		
Test Period: 01/25/22 - 01/28/22		
Kit Number	Room/Area	Result
11105652	225	Compromised
11105677	B09	Compromised
11105679	B14 GYM	Compromised

Table Note:

* Missing or Compromised Sample

ATTACHMENT C

Laboratory Analytical Results

P4792 / WILLIAM LYMAN

Kit Number	Start Date	Start Time	End Date	End Time	Temp.	Facility	Building	Room	Project ID	Floor	Result
11105627	2022-01-25	8:00 am	2022-01-28	8:00 am	72	WESTBROOK ES	MAIN	232		2	< 0.3
11105628	2022-01-25	8:00 am	2022-01-28	8:00 am	72	WESTBROOK ES	MAIN	208A		2	0.6
11105639	2022-01-25	8:00 am	2022-01-28	8:00 am	72	WESTBROOK ES	MAIN	200		2	1.3
11105640	2022-01-25	8:00 am	2022-01-28	8:00 am	72	WESTBROOK ES	MAIN	200D		2	1.1
11105641	2022-01-25	8:00 am	2022-01-28	8:00 am	72	WESTBROOK ES	MAIN	200A		2	1.5
11105642	2022-01-25	8:00 am	2022-01-28	8:00 am	72	WESTBROOK ES	MAIN	209		2	1.4
11105643	2022-01-25	8:00 am	2022-01-28	8:00 am	72	WESTBROOK ES	MAIN	229		2	< 0.3
11105644	2022-01-25	8:00 am	2022-01-28	8:00 am	72	WESTBROOK ES	MAIN	217		2	< 0.3
11105645	2022-01-25	8:00 am	2022-01-28	8:00 am	72	WESTBROOK ES	MAIN	208		2	0.6
11105646	2022-01-25	8:00 am	2022-01-28	8:00 am	72	WESTBROOK ES	MAIN	205		2	1.4
11105647	2022-01-25	8:00 am	2022-01-28	8:00 am	72	WESTBROOK ES	MAIN	129		1	1.3
11105648	2022-01-25	8:00 am	2022-01-28	8:00 am	72	WESTBROOK ES	MAIN	213		2	0.5
11105649	2022-01-25	8:00 am	2022-01-28	8:00 am	72	WESTBROOK ES	MAIN	128		1	< 0.3
11105650	2022-01-25	8:00 am	2022-01-28	8:00 am	72	WESTBROOK ES	MAIN	214		2	0.8
11105651	2022-01-25	8:00 am	2022-01-28	8:00 am	72	WESTBROOK ES	MAIN	210		2	< 0.3
11105652	2022-01-25	8:00 am	2022-01-28	8:00 am	72	WESTBROOK ES	MAIN	225		2	????
11105653	2022-01-25	8:00 am	2022-01-28	8:00 am	72	WESTBROOK ES	MAIN	212		2	0.6
11105654	2022-01-25	8:00 am	2022-01-28	8:00 am	72	WESTBROOK ES	MAIN	207		2	0.8
11105655	2022-01-25	8:00 am	2022-01-28	8:00 am	72	WESTBROOK ES	MAIN	211		2	0.6
11105657	2022-01-25	8:00 am	2022-01-28	8:00 am	72	WESTBROOK ES	MAIN	204		2	2.7
11105658	2022-01-25	8:00 am	2022-01-28	8:00 am	72	WESTBROOK ES	MAIN	205		2	1.5
11105659	2022-01-25	8:00 am	2022-01-28	8:00 am	72	WESTBROOK ES	MAIN	223		2	< 0.3
11105660	2022-01-25	8:00 am	2022-01-28	8:00 am	72	WESTBROOK ES	MAIN	219		2	< 0.3
11105661	2022-01-25	8:00 am	2022-01-28	8:00 am	72	WESTBROOK ES	MAIN	208		2	0.5
11105662	2022-01-25	8:00 am	2022-01-28	8:00 am	72	WESTBROOK ES	MAIN	126		1	1.6
11105663	2022-01-25	8:00 am	2022-01-28	8:00 am	72	WESTBROOK ES	MAIN	225		2	< 0.3
11105664	2022-01-25	8:00 am	2022-01-28	8:00 am	72	WESTBROOK ES	MAIN	225		2	< 0.3
11105665	2022-01-25	8:00 am	2022-01-28	8:00 am	72	WESTBROOK ES	MAIN	231		2	< 0.3
11105666	2022-01-25	8:00 am	2022-01-28	8:00 am	72	WESTBROOK ES	MAIN	234		2	1.0
11105667	2022-01-25	8:00 am	2022-01-28	8:00 am	72	WESTBROOK ES	MAIN	130		1	0.6
11105669	2022-01-25	9:00 am	2022-01-28	9:00 am	72	WESTBROOK ES	MAIN	130		1	< 0.3
11105670	2022-01-25	9:00 am	2022-01-28	9:00 am	72	WESTBROOK ES	MAIN	127		1	< 0.3
11105671	2022-01-25	9:00 am	2022-01-28	9:00 am	72	WESTBROOK ES	MAIN	B14 GYM		3	1.0
11105672	2022-01-25	9:00 am	2022-01-28	9:00 am	72	WESTBROOK ES	MAIN	B06		3	< 0.3
11105673	2022-01-25	9:00 am	2022-01-28	9:00 am	72	WESTBROOK ES	MAIN	132		1	< 0.3

P4792 / WILLIAM LYMAN

Kit Number	Start Date	Start Time	End Date	End Time	Temp.	Facility	Building	Room	Project ID	Floor	Result
11105674	2022-01-25	9:00 am	2022-01-28	9:00 am	72	WESTBROOK ES	MAIN	136		1	< 0.3
11105675	2022-01-25	9:00 am	2022-01-28	9:00 am	72	WESTBROOK ES	MAIN	137		1	0.6
11105676	2022-01-25	9:00 am	2022-01-28	9:00 am	72	WESTBROOK ES	MAIN	B14 A		3	1.0
11105677	2022-01-25	9:00 am	2022-01-28	9:00 am	72	WESTBROOK ES	MAIN	B09		3	????
11105678	2022-01-25	9:00 am	2022-01-28	9:00 am	72	WESTBROOK ES	MAIN	B08		3	< 0.3
11105679	2022-01-25	9:00 am	2022-01-28	9:00 am	72	WESTBROOK ES	MAIN	B14 GYM		3	????
11105680	2022-01-25	9:00 am	2022-01-28	9:00 am	72	WESTBROOK ES	MAIN	B11		3	< 0.3
11105681	2022-01-25	9:00 am	2022-01-28	9:00 am	72	WESTBROOK ES	MAIN	133		1	0.6
11105683	2022-01-25	9:00 am	2022-01-28	9:00 am	72	WESTBROOK ES	MAIN	100		1	1.5
11105684	2022-01-25	9:00 am	2022-01-28	9:00 am	72	WESTBROOK ES	MAIN	B17		3	1.2
11105685	2022-01-25	9:00 am	2022-01-28	9:00 am	72	WESTBROOK ES	MAIN	B09		3	< 0.3
11105686	2022-01-25	9:00 am	2022-01-28	9:00 am	72	WESTBROOK ES	MAIN	100		1	1.5
11105687	2022-01-25	9:00 am	2022-01-28	9:00 am	72	WESTBROOK ES	MAIN	B18B		3	2.3
11105688	2022-01-25	9:00 am	2022-01-28	9:00 am	72	WESTBROOK ES	MAIN	B17		3	1.3
11105689	2022-01-25	9:00 am	2022-01-28	9:00 am	72	WESTBROOK ES	MAIN	B18D		3	1.3
11105690	2022-01-25	9:00 am	2022-01-28	9:00 am	72	WESTBROOK ES	MAIN	120		1	< 0.3
11105691	2022-01-25	9:00 am	2022-01-28	9:00 am	72	WESTBROOK ES	MAIN	116		1	< 0.3
11105692	2022-01-25	9:00 am	2022-01-28	9:00 am	72	WESTBROOK ES	MAIN	103		1	< 0.3
11105694	2022-01-25	9:00 am	2022-01-28	9:00 am	72	WESTBROOK ES	MAIN	105		1	< 0.3
11105695	2022-01-25	9:00 am	2022-01-28	9:00 am	72	WESTBROOK ES	MAIN	114		1	< 0.3
11105696	2022-01-25	9:00 am	2022-01-28	9:00 am	72	WESTBROOK ES	MAIN	106		1	0.7
11105697	2022-01-25	9:00 am	2022-01-28	9:00 am	72	WESTBROOK ES	MAIN	104		1	0.7
11105699	2022-01-25	9:00 am	2022-01-28	9:00 am	72	WESTBROOK ES	MAIN	302		3	0.8
11107507	2022-01-25	9:00 am	2022-01-28	9:00 am	72	WESTBROOK ES	MAIN	117		1	< 0.3
11107511	2022-01-25	9:00 am	2022-01-28	9:00 am	72	WESTBROOK ES	MAIN	115		1	< 0.3
11107512	2022-01-25	9:00 am	2022-01-28	9:00 am	72	WESTBROOK ES	MAIN	115		1	< 0.3
11107517	2022-01-25	9:00 am	2022-01-28	9:00 am	72	WESTBROOK ES	MAIN	112		1	< 0.3
11107518	2022-01-25	9:00 am	2022-01-28	9:00 am	72	WESTBROOK ES	MAIN	121		1	0.6
11107519	2022-01-25	9:00 am	2022-01-28	9:00 am	72	WESTBROOK ES	MAIN	115		1	< 0.3

EXPOSURE IN BOWSER-MORNER RADON CHAMBER

CLIENT KCI Technologies, Inc. Job Number 203404

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

Date Start: 12/24/21 Date Stop: 12/27/21	Date Start: _____ Date Stop: _____
Time Start: 0809 Time Stop: 0809	Time Start: _____ Time Stop: _____
Device No.'s: (2) Char Bags - 9341721, 9341722	Device No.'s: _____
G4 Left	
Date Start: _____ Date Stop: _____	Date Start: _____ Date Stop: _____
Time Start: _____ Time Stop: _____	Time Start: _____ Time Stop: _____
Device No.'s: _____	Device No.'s: _____
Date Start: _____ Date Stop: _____	Date Start: _____ Date Stop: _____
Time Start: _____ Time Stop: _____	Time Start: _____ Time Stop: _____
Device No.'s: _____	Device No.'s: _____

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

December 31, 2021 **** LABORATORY ANALYSIS REPORT ****

Radon test result report for:

SK MA

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

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

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

KCI TECHNOLOGIES

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 – January 2022 Schools

Name of Schools:

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

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

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

MONTGOMERY COUNTY PUBLIC SCHOOLS
RADON TESTING

Executive Summary:
Westbrook Elementary School

5110 Allan Terrace,
Bethesda, MD 20816

Date of Test Report:	3/29/2019
Round of Testing:	Initial **Follow-up** Post Remediation 2 Year Testing 5 Year Testing HVAC Upgrade Window Replacement New Addition New Facility
# of Rooms Tested:	2
# of Rooms ≥ 4.0 pCi/L:	0
Low Value:	2.1
High Value:	2.1

Project Status
Retesting completed: No further action at this time.
Missing: B17

March 29, 2019

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

Re: Radon Testing Services

Location: Westbrook Elementary School
5110 Allan Terrace,
Bethesda, MD 20816

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 Westbrook Elementary School, located at 5110 Allan Terrace, Bethesda, MD 20816 (subject site).

Scope of Services:

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

PSI visited the site on February 26, 2019 and deployed one (1) activated charcoal (AC) radon test kit. PSI deployed radon test kits in frequently-occupied ground contact rooms, and other areas, (if applicable) in accordance with AARST guidance. PSI returned to the site on March 1, 2019 to retrieve the radon sampling test kit. On March 11, 2019 PSI deployed one (1) additional radon test kit in Room B17. On March 14, 2019 PSI returned to retrieve the test kit but the test kit was missing. 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 ≤ 65°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

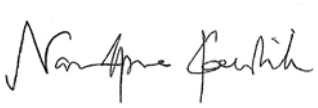
The office blank and lab transit blanks had test results of less than the laboratory detection limit of 0.4 pCi/L. Review of the duplicate sample analysis indicates that adequate laboratory measurement precision was achieved. The Spike sample analysis results indicate the laboratory is operating within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



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

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

ATTACHMENT B

Radon Test Summary Spreadsheet

Radon Testing Results		
Westbrook Elementary School		
Testing period: 2/26/19 - 3/1/19		
Kit Number	**Room / Area**	**Result (pCi/L)**
3923303	Room B18D	2.1
--	Room B17 (MISSING)	--

Radon Testing Results		
Westbrook Elementary School		
Testing period: 3/11/19 - 3/14/19		
Kit Number	**Room / Area**	**Result (pCi/L)**
--	Room B17 (MISSING)	--

Table Notes:

D – Duplicate

FB – Field Blank

OB – Office Blank

TB – Transit Blank

QC – Quality Control

ATTACHMENT C

Laboratory Analytical Results

AccuStar
Professional Radon Laboratory Services Since 1984

Radon in Air

NRPP 105011 AL
NRSB ARL0007

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

Laboratory Report for:

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

Property Tested: Project # 04481387-1

MCPS Radon Survey Westbrook Elementary School
5110 Allan Terrace
Bethesda MD 20816

Log Number	Device Number	Test Exposure Duration:				Area Tested	Result pCi/L
3220661	3923303	02/26/2019	2:26 pm	03/01/2019	11:43 am	First Floor Room B18D	2.1

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

Distributed by: Intertek-PSI (VA)

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

Report Reviewed By: _____ Report Approved By: _____

Shawn Price, Director of Laboratory Operations, AccuStar Labs

Disclaimer:

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

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:
Westbrook Elementary School

5110 Allan Terrace,
Bethesda, MD 20816

Date of Test Report:	02/21/2019
Round of Testing:	Initial Follow-up **Post Remediation** 2 Year Testing 5 Year Testing HVAC Upgrade Window Replacement New Addition New Facility
# of Rooms Tested:	32
# of Rooms ≥ 4.0 pCi/L:	0
Low Value:	< 0.4
High Value:	2.2

Project Status

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

February 21, 2019

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

Re: Radon Testing Services

Location: Westbrook Elementary School
5110 Allan Terrace,
Bethesda, MD 20816

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 Westbrook Elementary School, located at 5110 Allan Terrace, Bethesda, MD 20816 (subject site).

Scope of Services:

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

PSI visited the site on December 4, 2018 and deployed forty-two (42) activated charcoal (AC) radon test kits. PSI deployed radon test kits in frequently-occupied ground contact rooms, and other areas, (if applicable) in accordance with AARST guidance. PSI returned to the site on December 7, 2018 to retrieve the radon sampling test kits. A floor plan map of the building with the test locations is included as Attachment A of this report.

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

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

Evaluation of Testing Conditions:

The operating condition that represents the greatest amount of significantly occupied time for this building is; heating active, with outdoor temperature averages ≤ 65°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

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

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

ATTACHMENT B

Radon Test Summary Spreadsheet

Radon Testing Results		
Westbrook Elementary School		
Testing period: 12/4/18 - 12/7/18		
Kit Number	**Room / Area**	**Result (pCi/L)**
3923120	100	1.7
3923118	103	1.9
3923117	104	1.3
3923116	105	0.7
3923115	106	0.7
3923114	114	<0.4
3923113	116	0.4
3923112	120	<0.4
3923130	124	0.9
3923121	126	0.7
3923123	200	1.0
3923126	200A	0.8
3923127	200A.1	1.4
3923125	200D	0.7
3922972	204	1.8
3923030	205	2.2
3922970	207	0.8
3922971	208A	0.8
3923029	208A.1	<0.4
3923128	209	0.6
3923122	225	0.4
3922973	302	0.9
3923004	B06	<0.4
3923003	B08	<0.4
3923002	B09	<0.4
3923001	B11	<0.4
3923006	B14	0.8
3923005	B14	<0.4
3923007	B14A	2.1
3888435	B17	0.6
3923111	B17 (MISSING)	--
3923009	B18-B	1.4
--	B18D (MISSED)	--
3923008	Kitchen	<0.4
3923124	Mail Room	0.8

Radon Testing Results		
Westbrook Elementary School		
Testing period: 12/4/18 - 12/7/18		
Kit Number	**QC Type**	**Result (pCi/L)**
3923119	103 (D)	2.2
3923129	209 (D)	0.7
3922974	302 (D)	0.6
3923010	B18-B (D)	1.4
3923163	Field Blank	<0.4
3923164	Field Blank	<0.4
3917543	Office Blank	<0.4
3917533	Transit Blank	<0.4

Table Notes:

D – Duplicate

FB – Field Blank

OB – Office Blank

TB – Transit Blank

QC – Quality Control

ATTACHMENT C

Laboratory Analytical Results

AccuStar
Professional Radon Laboratory Services Since 1984

Radon in Air

NELAC NY 11769
NRPP 103216 AL
NRSB ARL0017

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

Laboratory Report for:

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

Property Tested: Project # 04481387-1

MCPS Radon Survey
Westbrook Elementary School
Bethesda MD 20817

Log Number	Device Number	Test Exposure Duration:		Area Tested	Result pCi/L
2405348	3923001	12/04/2018 1:40 pm	12/07/2018 11:19 am	Bldg Westbrook Elementary School Flr 1 Rm B11	< 0.4
2405349	3923002	12/04/2018 1:40 pm	12/07/2018 11:19 am	Bldg Westbrook Elementary School Flr 1 Rm B09	< 0.4
2405350	3923003	12/04/2018 1:41 pm	12/07/2018 11:20 am	Bldg Westbrook Elementary School Flr 1 Rm B08	< 0.4
2405351	3923004	12/04/2018 1:42 pm	12/07/2018 11:20 am	Bldg Westbrook Elementary School Flr 1 Rm B06	< 0.4
2405352	3923005	12/04/2018 1:48 pm	12/07/2018 11:22 am	Bldg Westbrook Elementary School Flr 1 Rm B14	< 0.4
2405353	3923006	12/04/2018 1:49 pm	12/07/2018 11:23 am	Bldg Westbrook Elementary School Flr 1 Rm B14	0.8
2405354	3923007	12/04/2018 1:50 pm	12/07/2018 11:22 am	Bldg Westbrook Elementary School Flr 1 Rm B14	2.1
2405355	3923008	12/04/2018 1:51 pm	12/07/2018 11:23 am	Bldg Westbrook Elementary School Flr 1 Rm Kitc	< 0.4
2405356	3923009	12/04/2018 1:52 pm	12/07/2018 11:24 am	Bldg Westbrook Elementary School Flr 1 Rm B18	1.4
2405357	3923010	12/04/2018 1:52 pm	12/07/2018 11:24 am	Bldg Westbrook Elementary School Flr 1 Rm B18	1.4
2405358	3923112	12/04/2018 1:57 pm	12/07/2018 11:31 am	Bldg Westbrook Elementary School Flr 1 Rm 120	< 0.4

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

Distributed by: Intertek-PSI (VA)

Date Received: 12/08/2018 Date Logged: 12/08/2018 Date Analyzed: 12/11/2018 Date Reported: 01/29/2019

Report Reviewed By: _____ Report Approved By: _____

Shawn Price, Director of Laboratory Operations, AccuStar Labs

Disclaimer:

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

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
Charcoal Canister
NRPP Device Code 6048
NRSB Device Code 10317

Laboratory Report for:

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

Property Tested: Project # 04481387-1

MCPS Radon Survey
Westbrook Elementary School
Bethesda MD 20817

Log Number	Device Number	Test Exposure Duration:		Area Tested	Result pCi/L
2405359	3923113	12/04/2018 1:58 pm	12/07/2018 11:44 am	Bldg Westbrook Elementary School Flr 1 Rm 116	0.4
2405360	3923114	12/04/2018 1:59 pm	12/07/2018 11:32 am	Bldg Westbrook Elementary School Flr 1 Rm 114	< 0.4
2405361	3923115	12/04/2018 2:01 pm	12/07/2018 11:33 am	Bldg Westbrook Elementary School Flr 1 Rm 106	0.7
2405362	3923116	12/04/2018 2:02 pm	12/07/2018 11:44 am	Bldg Westbrook Elementary School Flr 1 Rm 105	0.7
2405363	3923117	12/04/2018 2:03 pm	12/07/2018 11:35 am	Bldg Westbrook Elementary School Flr 1 Rm 104	1.3
2405364	3923118	12/04/2018 2:03 pm	12/07/2018 11:36 am	Bldg Westbrook Elementary School Flr 1 Rm 103	1.9
2405365	3923119	12/04/2018 2:04 pm	12/07/2018 11:36 am	Bldg Westbrook Elementary School Flr 1 Rm 103	2.2
2405366	3923120	12/04/2018 2:07 pm	12/07/2018 11:36 am	Bldg Westbrook Elementary School Flr 1 Rm 100	1.7
2405367	3923121	12/04/2018 2:13 pm	12/07/2018 11:44 am	Bldg Westbrook Elementary School Flr 2 Rm 126	0.7
2405368	3923122	12/04/2018 2:17 pm	12/07/2018 11:42 am	Bldg Westbrook Elementary School Flr 2 Rm 225	0.4
2405369	3923123	12/04/2018 2:18 pm	12/07/2018 11:43 am	Bldg Westbrook Elementary School Flr 2 Rm 200	1.0

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

Distributed by: Intertek-PSI (VA)

Date Received: 12/08/2018 Date Logged: 12/08/2018 Date Analyzed: 12/11/2018 Date Reported: 01/29/2019

Report Reviewed By: _____ Report Approved By: _____

Shawn Price, Director of Laboratory Operations, AccuStar Labs

Disclaimer:

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NELAC NY 11769
NRPP 103216 AL
NRSB ARL0017

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

Laboratory Report for:

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

Property Tested: Project # 04481387-1

MCPS Radon Survey
Westbrook Elementary School
Bethesda MD 20817

Log Number	Device Number	Test Exposure Duration:		Area Tested	Result pCi/L
2405370	3923124	12/04/2018 2:19 pm	12/07/2018 11:45 am	Bldg Westbrook Elementary School Flr 2 Rm Mail	0.8
2405371	3923125	12/04/2018 2:20 pm	12/07/2018 11:45 am	Bldg Westbrook Elementary School Flr 2 Rm 200	0.7
2405372	3923126	12/04/2018 2:21 pm	12/07/2018 11:43 am	Bldg Westbrook Elementary School Flr 2 Rm 200	1.4
2405373	3923127	12/04/2018 2:22 pm	12/07/2018 11:43 am	Bldg Westbrook Elementary School Flr 2 Rm 200	1.4
2405374	3923128	12/04/2018 2:22 pm	12/07/2018 11:46 am	Bldg Westbrook Elementary School Flr 2 Rm 209	0.6
2405375	3923129	12/04/2018 2:22 pm	12/07/2018 11:46 am	Bldg Westbrook Elementary School Flr 2 Rm 209	0.7
2405376	3923130	12/04/2018 2:34 pm	12/07/2018 11:49 am	Bldg Westbrook Elementary School Flr 2 Rm 124	0.9
2405377	3922970	12/04/2018 2:35 pm	12/07/2018 11:50 am	Bldg Westbrook Elementary School Flr 2 Rm 207	0.8
2405378	3922971	12/04/2018 2:36 pm	12/07/2018 11:50 am	Bldg Westbrook Elementary School Flr 2 Rm 208	0.8
2405379	3923029	12/04/2018 2:37 pm	12/07/2018 11:50 am	Bldg Westbrook Elementary School Flr 2 Rm 208	< 0.4
2405380	3923030	12/04/2018 2:39 pm	12/07/2018 11:51 am	Bldg Westbrook Elementary School Flr 2 Rm 205	2.2

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

Distributed by: Intertek-PSI (VA)

Date Received: 12/08/2018 Date Logged: 12/08/2018 Date Analyzed: 12/11/2018 Date Reported: 01/29/2019

Report Reviewed By: _____ Report Approved By: _____

Shawn Price, Director of Laboratory Operations, AccuStar Labs

Disclaimer:

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NELAC NY 11769
NRPP 103216 AL
NRSB ARL0017

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

Laboratory Report for:

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

Property Tested: Project # 04481387-1

MCPS Radon Survey
Westbrook Elementary School
Bethesda MD 20817

Log Number	Device Number	Test Exposure Duration:		Area Tested	Result pCi/L
2405381	3922972	12/04/2018 2:40 pm	12/07/2018 11:51 am	Bldg Westbrook Elementary School Flr 2 Rm 204	1.8
2405382	3922973	12/04/2018 2:42 pm	12/07/2018 11:52 am	Bldg Westbrook Elementary School Flr 3 Rm 302	0.9
2405383	3922974	12/04/2018 2:42 pm	12/07/2018 11:52 am	Bldg Westbrook Elementary School Flr 3 Rm 302	0.6
2405384	3923163	12/04/2018 1:40 pm	12/07/2018 11:52 am	Bldg Westbrook Elementary School Flr NA Rm N	< 0.4
2405385	3923164	12/04/2018 1:40 pm	12/07/2018 11:52 am	Bldg Westbrook Elementary School Flr NA Rm N	< 0.4
2405386	3917543	12/04/2018 6:00 am	12/07/2018 11:52 am	Bldg Westbrook Elementary School Flr NA Rm N	< 0.4
2405387	3917533	12/04/2018 6:00 am	12/07/2018 11:52 am	Bldg Westbrook Elementary School Flr NA Rm N	< 0.4

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

Distributed by: Intertek-PSI (VA)

Date Received: 12/08/2018 Date Logged: 12/08/2018 Date Analyzed: 12/11/2018 Date Reported: 01/29/2019

Report Reviewed By: _____ Report Approved By: _____

Shawn Price, Director of Laboratory Operations, AccuStar Labs

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AccuStar
Professional Radon Laboratory Services Since 1984

NELAC NY 11769
NRPP 103216 AL
NRSB ARL0017

Laboratory Report for:

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

Property Tested: Project # 04481387-1

MCPS Radon Survey
Westbrook Elementary School
MD 20817

Log Number	Device Number	Test Exposure Duration:		Area Tested	Result pCi/L
2405388	3888435	12/04/2018 1:53 pm	12/07/2018 11:25 am	Bldg Westbrook Elementary School Flr 1 Rm B17	0.6

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

Distributed by: Intertek-PSI (VA)

Date Received: 12/08/2018 Date Logged: Date Analyzed: 12/10/2018 Date Reported: 01/02/2019

Report Reviewed By: _____ Report Approved By: _____

Shawn Price, Director of Laboratory Operations, AccuStar Labs

Disclaimer:

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AccuStar
Professional Radon Laboratory Services Since 1984

Radon in Air

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:

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

Property Tested:

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: _____

Shawn Price, Director of Laboratory Operations, AccuStar Labs

Disclaimer:

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EXPOSURE IN BOWSER-MORNER RADON CHAMBER

CLIENT Intertek - PSI Job Number 187732

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

Date Start: 12/7/18 Date Stop: 12/10/18	Date Start: _____ Date Stop: _____
Time Start: 0947 Time Stop: 0947	Time Start: _____ Time Stop: _____
Device No.'s: (10) Char. Cans -	Device No.'s: _____
3926831 thru 3926840	_____
_____	_____
Gx Left	_____
Date Start: _____ Date Stop: _____	Date Start: _____ Date Stop: _____
Time Start: _____ Time Stop: _____	Time Start: _____ Time Stop: _____
Device No.'s: _____	Device No.'s: _____
_____	_____
_____	_____
_____	_____
Date Start: _____ Date Stop: _____	Date Start: _____ Date Stop: _____
Time Start: _____ Time Stop: _____	Time Start: _____ Time Stop: _____
Device No.'s: _____	Device No.'s: _____
_____	_____
_____	_____
_____	_____

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

intertek
psi

Chain of Custody

Project Name: MCPS Radon Survey 2018

Name of Schools:

1. Grosvenor Center (Luxmanor ES)
2. Montrose Center
3. Gibbs ES
4. Westbrook ES
5. Hadley Farms (Resnik ES)
6. Kingsview MS
7. Longview School
8. Lynnbrook Center
9. Magruder HS
10. McAuliffe ES
11. McNair ES
12. Mill Creek Towne ES
13. Martin Luther King MS
14. Montgomery Village MS
15. Great Seneca Creek ES
16. Quince Orchard HS
17. Redland MS
18. North Bethesda MS
19. Spark Matsunaga ES
20. Whetstone ES
21. Wood Acres ES

	Date	Initials
Radon Test Kits Deployed	12/04/2018	NL
Radon Test Kits Sampled	12/07/2018	NL
Radon Test Kits Shipped to Lab*	12/07/2018	NL
Radon Test Kits Received by Lab*	12/08/2018; 12/09/2018	NL

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

RADON SCREENING SURVEY – FOLLOW-UP WESTBROOK ELEMENTARY SCHOOL

5110 Allan Terr., Bethesda, Maryland 20816

EXECUTIVE SUMMARY

Date of Test Report:	3/28/18
Round of Testing:	Initial Follow-up Post Remediation
# Rooms Tested	3
# Rooms ≥ 4.0 pCi/L:	1
Low Value:	2.6
High Value:	5.3
Confirmed Rooms ≥ 4.0 pCi/L US EPA Action Level	2

Summary of Sampling Events ≥ 4.0 pCi/L

Room	Result (pCi/L) 1/30/18	Result (pCi/L) 3/9/18	Result (pCi/L) 3/28/18	Average Result (pCi/L)
124	Not Sampled	7.0	3.2	5.1
205	Not Sampled	5.3	5.3	5.3
100	Not Sampled	4.0	2.6	3.3

KCI TECHNOLOGIES
ENGINEERS • PLANNERS • SCIENTISTS • CONSTRUCTION MANAGERS
936 RIDGEBROOK ROAD • SPARKS, MD 21152 • 410-316-7800 • (FAX) 410-316-7935

MCPS RADON TESTING - EXECUTIVE SUMMARY

Site Name	Westbrook Elementary School
Date of Report	March 28, 2018
Round of Testing	Initial **Follow-up** Post Remediation 2 year testing 5 year testing HVAC Upgrade Window Replacement New Addition New Facility
# of Rooms Tested	3
# Rooms ≥4.0 pCi/L	1
Lowest Value	2.6 pCi/L
Highest Value	5.3 pCi/L

Project Status

Rooms with results ≥ 4.0 pCi/L: 205 (5.3 pCi/L)

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

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March 28, 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: Westbrook Elementary School
5110 Allan Terr.
Bethesda, Maryland 20816

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 Westbrook Elementary School, located at 5110 Allan Terr. in Bethesda, Maryland 20816 (subject site).

SCOPE OF SERVICES

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

KCI visited the site on March 19, 2018 and deployed three (3) activated charcoal (AC) radon test kits. KCI deployed radon test kits in frequently-occupied ground contact rooms, and other areas, (if applicable) in accordance with AARST guidance.

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

1. Rooms with elevated February 2018 results.

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 March 22, 2018 to retrieve the radon sampling test kits. KCI shipped all radon tests via overnight delivery to Aircheck, Inc. for analysis by gamma-ray spectroscopy. Aircheck, Inc. is a NRSB certified analytical laboratory for radon analysis (certification #ARL1402) located at 1936 Butler Bridge Road, Mills River, North Carolina.

EVALUATION OF TESTING CONDITIONS

These tests represent:

- Follow-up to post-mitigation biennial testing.

These tests were conducted to:

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

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

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

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

KCI also compiled weather data for the testing period and conducted observations of relevant field conditions. During the test period, weather records indicate low temperatures were in the upper-20s and high temperatures ranged from the mid-30s to the low-60s. Maximum sustained winds ranged from 9-16 miles per hour. Average humidity was around 74%. 1.04 Inches of precipitation including rain and snow, were recorded during the testing period. The weather conditions during the testing period may have resulted in atypical radon test results for this facility.

RESULTS

The sampling locations and analytical results are listed on Table 1 (Attachment B). The 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 piC/L	205	5.3
≤4.0 piC/L	See Attachment 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 410-316-7800.

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

Radon Testing Results		
Westbrook Elementary School		
Test Period: 03/19/18-03/22/18		
Kit Number	**Room / Area**	**Result**
7986558	100	2.6
7979488	124	3.2
7986545	205	5.3

Table Note:
* Missing or Compromised Sample

ATTACHMENT C

Laboratory Analytical Results

March 26, 2018 **** LABORATORY ANALYSIS REPORT ****

Radon test result report for:
WESTBROOK ELEMENTARY SCHOOL
MAIN

Kit #	Room Id	Started	Ended	pCi/L	Analyzed
7986558	100	2018-03-19 @ 10:00 am	2018-03-22 @ 8:00 am	2.6 ± 0.4	2018-03-26
7979488	124	2018-03-19 @ 10:00 am	2018-03-22 @ 8:00 am	3.2 ± 0.5	2018-03-26
7986545	205	2018-03-19 @ 10:00 am	2018-03-22 @ 8:00 am	5.3 ± 0.6	2018-03-26

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

KCI TECHNOLOGIES

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. Clearspring Elementary School
2. Maryvale Elementary School
3. Watkins Mill High School
4. Westbrook Elementary School

	Date	Initials
Radon Test Kits Deployed	3/19/18	JM
Radon Test Kits Collected	3/22/18	JM
Radon Test Kits Shipped to Lab*	3/23/18	JM
Radon Test Kits Received by Lab*	3/26/18	JM

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

February 27, 2018 **** LABORATORY ANALYSIS REPORT ****

Radon test result report for:
OFFICE BLANKS

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

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

February 27, 2018 **** LABORATORY ANALYSIS REPORT ****

Radon test result report for:
TRANSIT BLANKS

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

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

February 28, 2018 **** LABORATORY ANALYSIS REPORT ****

Radon test result report for:

MCPS - Spike Sample Laboratory Results. Measured values are satisfactory, i.e. within ±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 ± 0.8	2018-02-21
7986621	2	2018-02-16 @ 11:00 am	2018-02-19 @ 11:00 am	19.4 ± 0.8	2018-02-21
7985683	3	2018-02-16 @ 11:00 am	2018-02-19 @ 11:00 am	19.5 ± 0.8	2018-02-21
7984168	4	2018-02-16 @ 11:00 am	2018-02-19 @ 11:00 am	20.5 ± 0.8	2018-02-21
7986618	5	2018-02-16 @ 11:00 am	2018-02-19 @ 11:00 am	19.9 ± 0.8	2018-02-21
7984169	6	2018-02-16 @ 11:00 am	2018-02-19 @ 11:00 am	20.4 ± 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 µR/h Elevation = 820 ft

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MCPS RADON TESTING - EXECUTIVE SUMMARY

Site Name	Westbrook Elementary School
Date of Report	March 14, 2018
Round of Testing	Initial **Follow-up** Post Remediation 2 year testing 5 year testing HVAC Upgrade Window Replacement New Addition New Facility
# of Rooms Tested	9
# Rooms ≥4.0 pCi/L	3
Lowest Value	0.7 pCi/L
Highest Value	7.0 pCi/L

Project Status

Rooms with results ≥ 4.0 pCi/L: 124 (7.0 pCi/L), 205 (5.3 pCi/L), 100 (4.0 pCi/L)

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

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March 14, 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: Westbrook Elementary School
5110 Allan Terr.
Bethesda, Maryland 20816

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 Westbrook Elementary School, located at 5110 Allan Terr. in Bethesda, Maryland 20816 (subject site).

SCOPE OF SERVICES

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

KCI visited the site on February 13, 2018 and deployed eleven (11) activated charcoal (AC) radon test kits. KCI deployed radon test kits in frequently-occupied ground contact rooms, and other areas, (if applicable) in accordance with AARST guidance.

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

1. Rooms not successfully tested,
2. Rooms with elevated November 2017 results (i.e. ≥3.5 piC/L).

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

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

KCI returned to the site on February 16, 2018 to retrieve the radon sampling test kits. KCI shipped all radon tests via overnight delivery to Aircheck, Inc. for analysis by gamma-ray spectroscopy. Aircheck, Inc. is a NRSB certified analytical laboratory for radon analysis (certification #ARL1402) located at 1936 Butler Bridge Road, Mills River, North Carolina.

EVALUATION OF TESTING CONDITIONS

These tests represent:

- Follow-up to post-mitigation biennial testing.

These tests were conducted to:

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

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

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

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

KCI also compiled weather data for the testing period and conducted observations of relevant field conditions. During the test period, weather records indicate low temperatures ranged from the mid-20s to upper 40s and high temperatures ranged from the high-30s to the high-60s. Maximum sustained winds ranged from 10-18 miles per hour. Average humidity was around 73%. 0.30 Inches of precipitation was recorded during the testing period.

RESULTS

The sampling locations and analytical results are listed on Table 1 (Attachment B). The quality control sample locations and analytical results are listed on Table 2 (Attachment B). The laboratory analytical results are included in Attachment C. Laboratory results and exposure data for the spike samples are also included in Attachment C.

The results of the radon test analysis indicated the following:

Radon Concentration	Room	Result
≥4.0 piC/L	124	7.0
≥4.0 piC/L	205	5.3
≥4.0 piC/L	100	4.0
≤4.0 piC/L	See Attachment B	See Attachment B

Quality Control Samples	
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		
Westbrook Elementary School		
Test Period: 02/13/18-02/16/18		
Kit Number	**Room / Area**	**Result**
7975494	100	4.0
7975500	124	7.0
7975487	205	5.3
7975488	207	2.7
7975489	208	1.7
7975490	209	2.7
7975485	211	0.8
7975492	231	0.8
7975486	B19	2.0

Table Note:
* Missing or Compromised Sample

Table 2 - Radon Testing Results		
Westbrook Elementary School		
Test Period: 02/13/18-02/16/18		
Kit Number	**QC Type**	**Result**
7975491	D (211)	0.7
7975493	FB (124)	< 0.3

Table Note:
* Missing or Compromised Sample

ATTACHMENT C

Laboratory Analytical Results

February 27, 2018 **** LABORATORY ANALYSIS REPORT ****

Radon test result report for:
WESTBROOK ELEMENTARY SCHOOL
MAIN

Kit #	Room Id	Started	Ended	pCi/L	Analyzed
7975494	100	2018-02-13 @ 9:00 am	2018-02-16 @ 9:00 am	4.0 ± 0.5	2018-02-20
7975493	124	2018-02-13 @ 9:00 am	2018-02-16 @ 10:00 am	< 0.3	2018-02-20
7975500	124	2018-02-13 @ 9:00 am	2018-02-16 @ 10:00 am	7.0 ± 0.6	2018-02-20
7975487	205	2018-02-13 @ 9:00 am	2018-02-16 @ 9:00 am	5.3 ± 0.5	2018-02-20
7975488	207	2018-02-13 @ 9:00 am	2018-02-16 @ 9:00 am	2.7 ± 0.4	2018-02-20
7975489	208	2018-02-13 @ 9:00 am	2018-02-16 @ 9:00 am	1.7 ± 0.3	2018-02-20
7975490	209	2018-02-13 @ 9:00 am	2018-02-16 @ 9:00 am	2.7 ± 0.4	2018-02-20
7975485	211	2018-02-13 @ 9:00 am	2018-02-16 @ 9:00 am	0.8 ± 0.3	2018-02-20
7975491	211	2018-02-13 @ 9:00 am	2018-02-16 @ 9:00 am	0.7 ± 0.3	2018-02-20
7975492	231	2018-02-13 @ 9:00 am	2018-02-16 @ 9:00 am	0.8 ± 0.3	2018-02-20
7975486	B19	2018-02-13 @ 9:00 am	2018-02-16 @ 9:00 am	2.0 ± 0.4	2018-02-20

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

KCI TECHNOLOGIES

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

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

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

February 27, 2018 **** LABORATORY ANALYSIS REPORT ****

Radon test result report for:
OFFICE BLANKS

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

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

February 27, 2018 **** LABORATORY ANALYSIS REPORT ****

Radon test result report for:
TRANSIT BLANKS

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

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

February 28, 2018 **** LABORATORY ANALYSIS REPORT ****

Radon test result report for:

MCPS - Spike Sample Laboratory Results. Measured values are satisfactory, i.e. within ±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 ± 0.8	2018-02-21
7986621	2	2018-02-16 @ 11:00 am	2018-02-19 @ 11:00 am	19.4 ± 0.8	2018-02-21
7985683	3	2018-02-16 @ 11:00 am	2018-02-19 @ 11:00 am	19.5 ± 0.8	2018-02-21
7984168	4	2018-02-16 @ 11:00 am	2018-02-19 @ 11:00 am	20.5 ± 0.8	2018-02-21
7986618	5	2018-02-16 @ 11:00 am	2018-02-19 @ 11:00 am	19.9 ± 0.8	2018-02-21
7984169	6	2018-02-16 @ 11:00 am	2018-02-19 @ 11:00 am	20.4 ± 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 µR/h Elevation = 820 ft

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MCPS RADON TESTING - EXECUTIVE SUMMARY

Site Name	Westbrook Elementary School
Date of Report	January 30, 2018
Round of Testing	Initial Follow-up Post Remediation **2 year testing** 5 year testing HVAC Upgrade Window Replacement New Addition New Facility
# of Rooms Tested	28
# Rooms ≥4.0 pCi/L	0
Lowest Value	< 0.3 pCi/L
Highest Value	3.5 pCi/L

Project Status

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

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January 30, 2018

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

Re: Radon Testing Services

KCI Job #1214694182

Location: Westbrook Elementary School
5110 Allan Terr.
Bethesda, Maryland 20816

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 Westbrook Elementary School, located at 5110 Allan Terr. in Bethesda, Maryland 20816 (subject site).

SCOPE OF SERVICES

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

KCI visited the site on November 27, 2017 and deployed thirty-seven (37) activated charcoal (AC) radon test kits. KCI deployed radon test kits in frequently-occupied ground contact rooms, and other areas, (if applicable) in accordance with AARST guidance. A floor plan map of the building with the test locations is included as Appendix A of this report.

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

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

KCI returned to the site on November 30, 2017 to retrieve the radon sampling test kits. KCI shipped all radon tests via overnight delivery to Aircheck, Inc. for analysis by gamma-ray spectroscopy. Aircheck, Inc. is a NRSB certified analytical laboratory for radon analysis (certification #ARL1402) located at 1936 Butler Bridge Road, Mills River, North Carolina.

EVALUATION OF TESTING CONDITIONS

These tests represent:

- Post-mitigation biennial testing.

These tests were conducted to:

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

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

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

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

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

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

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

RESULTS

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

The results of the radon test analysis indicated the following:

Radon Concentration	Room	Result
≥4.0 piC/L	None	N/A
≤4.0 piC/L	See Attachment B	See Attachment B

Quality Control Samples	
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 Moulsdale, 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		
Westbrook Elementary School		
Test Period: 11/27/17-11/30/17		
Kit Number	**Room / Area**	**Result**
7975712	103	0.8
7975719	104	2.5
7975720	105	0.8
7975725	106	1.0
7975714	114	< 0.3
7975721	116	0.6
7975722	120	< 0.3
7975715	127	3.5
7975716	128	1.2
7975723	129	0.7
7975724	130	0.9
7975734	200	1.7
7975736	204	2.3
7975735	207	1.9
7975730	212	0.9
7975731	223	< 0.3
7975737	302	1.6
7975733	200A	2.6
7975732	200D	2.0
7975701	B06	< 0.3
7975702	B08	< 0.3
7975703	B09	0.8
7975704	B11	< 0.3
7975709	B14	0.8
7975710	B14	< 0.3
7975705	B14A	0.8
7975706	B17	2.5
7975707	B17	2.7
7975713	B18B	1.9
7975711	B18D	1.9

Table Note:
* Missing or Compromised Sample

Radon Testing Results		
Westbrook Elementary School		
Test Period: 11/27/17-11/30/17		
Kit Number	**QC Type**	**Result**
7975717	D (103)	0.7
7975726	D (106)	< 0.3
7975727	D (120)	< 0.3
7975708	D (B17)	2.6
7975718	FB (103)	< 0.3
7975728	FB (120)	< 0.3
7977283	OB (OB)	< 0.3

Table Note:
* Missing or Compromised Sample

Summary of Missed Locations		
Westbrook Elementary School		
Test Period: 11/27/17-11/30/17		
Kit Number	**Room / Area**	**Result**
-	205 (Missed location)	-
-	211 (Missed location)	-
-	231 (Missed location)	-
-	208 (Missed location)	-
-	207 (Missed location)	-
-	124 (Missed location)	-
-	209 (Missed location)	-
-	B19 Kitchen (Missed location)	-

Summary of Missing, Compromised and ≥4 piC/L Tests		
Westbrook Elementary School		
Test Period: 11/27/17-11/30/17		
Kit Number	**Room / Area**	**Result**
	(none)	

Table Note:
* Missing or Compromised Sample

ATTACHMENT C

Laboratory Analytical Results

December 19, 2017 **** LABORATORY ANALYSIS REPORT ****

Radon test result report for:
WESTBROOK ES
MAIN

Kit #	Room Id	Started	Ended	pCi/L	Analyzed
7975717	103	2017-11-27 @ 11:00 am	2017-11-30 @ 10:00 am	0.7 ± 0.3	2017-12-04
7975712	103	2017-11-27 @ 11:00 am	2017-11-30 @ 10:00 am	0.8 ± 0.3	2017-12-04
7975718	103	2017-11-27 @ 11:00 am	2017-11-30 @ 10:00 am	< 0.3	2017-12-04
7975719	104	2017-11-27 @ 11:00 am	2017-11-30 @ 10:00 am	2.5 ± 0.4	2017-12-04
7975720	105	2017-11-27 @ 11:00 am	2017-11-30 @ 10:00 am	0.8 ± 0.4	2017-12-04
7975725	106	2017-11-27 @ 11:00 am	2017-11-30 @ 10:00 am	1.0 ± 0.4	2017-12-04
7975726	106	2017-11-27 @ 11:00 am	2017-11-30 @ 10:00 am	< 0.3	2017-12-04
7975714	114	2017-11-27 @ 11:00 am	2017-11-30 @ 10:00 am	< 0.3	2017-12-04
7975721	116	2017-11-27 @ 11:00 am	2017-11-30 @ 10:00 am	0.6 ± 0.3	2017-12-04
7975727	120	2017-11-27 @ 11:00 am	2017-11-30 @ 10:00 am	< 0.3	2017-12-04
7975722	120	2017-11-27 @ 11:00 am	2017-11-30 @ 10:00 am	< 0.3	2017-12-04
7975728	120	2017-11-27 @ 11:00 am	2017-11-30 @ 10:00 am	< 0.3	2017-12-04
7975715	127	2017-11-27 @ 11:00 am	2017-11-30 @ 10:00 am	3.5 ± 0.5	2017-12-04
7975724	130	2017-11-27 @ 11:00 am	2017-11-30 @ 10:00 am	0.9 ± 0.3	2017-12-04
7975716	128	2017-11-27 @ 11:00 am	2017-11-30 @ 10:00 am	1.2 ± 0.4	2017-12-04
7975723	129	2017-11-27 @ 11:00 am	2017-11-30 @ 10:00 am	0.7 ± 0.3	2017-12-04
7975734	200	2017-11-27 @ 12:00 pm	2017-11-30 @ 10:00 am	1.7 ± 0.4	2017-12-04
7975733	200A	2017-11-27 @ 12:00 pm	2017-11-30 @ 10:00 am	2.6 ± 0.4	2017-12-04
7975732	200D	2017-11-27 @ 12:00 pm	2017-11-30 @ 10:00 am	2.0 ± 0.4	2017-12-04
7975736	204	2017-11-27 @ 12:00 pm	2017-11-30 @ 10:00 am	2.3 ± 0.4	2017-12-04
7975735	207	2017-11-27 @ 12:00 pm	2017-11-30 @ 10:00 am	1.9 ± 0.4	2017-12-04
7975730	212	2017-11-27 @ 12:00 pm	2017-11-30 @ 10:00 am	0.9 ± 0.4	2017-12-04
7975731	223	2017-11-27 @ 12:00 pm	2017-11-30 @ 10:00 am	< 0.3	2017-12-04
7975737	302	2017-11-27 @ 12:00 pm	2017-11-30 @ 10:00 am	1.6 ± 0.4	2017-12-04
7975701	B06	2017-11-27 @ 10:00 am	2017-11-30 @ 10:00 am	< 0.3	2017-12-04
7975702	B08	2017-11-27 @ 10:00 am	2017-11-30 @ 10:00 am	< 0.3	2017-12-04
7975703	B09	2017-11-27 @ 10:00 am	2017-11-30 @ 10:00 am	0.8 ± 0.4	2017-12-04
7975704	B11	2017-11-27 @ 10:00 am	2017-11-30 @ 10:00 am	< 0.3	2017-12-04
7975709	B14	2017-11-27 @ 10:00 am	2017-11-30 @ 10:00 am	0.8 ± 0.3	2017-12-04
7975710	B14	2017-11-27 @ 10:00 am	2017-11-30 @ 10:00 am	< 0.3	2017-12-04
7975705	B14A	2017-11-27 @ 10:00 am	2017-11-30 @ 10:00 am	0.8 ± 0.4	2017-12-04
7975706	B17	2017-11-27 @ 10:00 am	2017-11-30 @ 10:00 am	2.5 ± 0.4	2017-12-04
7975707	B17	2017-11-27 @ 10:00 am	2017-11-30 @ 10:00 am	2.7 ± 0.4	2017-12-04
7975708	B17	2017-11-27 @ 10:00 am	2017-11-30 @ 10:00 am	2.6 ± 0.4	2017-12-04
7975713	B18B	2017-11-27 @ 10:00 am	2017-11-30 @ 10:00 am	1.9 ± 0.4	2017-12-04
7975711	B18D	2017-11-27 @ 10:00 am	2017-11-30 @ 10:00 am	1.9 ± 0.4	2017-12-04
7977283	OB	2017-11-27 @ 1:00 pm	2017-11-30 @ 1:00 pm	< 0.3	2017-12-05

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

KCI TECHNOLOGIES

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

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

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

December 19, 2017 **** LABORATORY ANALYSIS REPORT ****

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

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

December 19, 2017 **** LABORATORY ANALYSIS REPORT ****

Radon test result report for:

MCPS - Spike Sample Laboratory Results. Measured values are satisfactory, i.e. within ±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 ± 0.7	2017-12-07
7975064	S2	2017-12-01 @ 11:00 am	2017-12-04 @ 11:00 am	27.4 ± 0.8	2017-12-07
7975063	S3	2017-12-01 @ 11:00 am	2017-12-04 @ 11:00 am	26.3 ± 0.7	2017-12-07
7975065	S4	2017-12-01 @ 11:00 am	2017-12-04 @ 11:00 am	23.0 ± 0.7	2017-12-07
7975069	S5	2017-12-01 @ 11:00 am	2017-12-04 @ 11:00 am	25.6 ± 0.7	2017-12-07
7975070	S6	2017-12-01 @ 11:00 am	2017-12-04 @ 11:00 am	23.0 ± 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

Time Start: 1049 Time Stop: 1049

Device No.'s: (6) Chan. Bags.

7975075, 7975064, 7975063,

7975065, 7975069, 7975070

F4 Right

Date Start: _____ Date Stop: _____

Time Start: _____ Time Stop: _____

Device No.'s: _____

Date Start: _____ Date Stop: _____

Time Start: _____ Time Stop: _____

Device No.'s: _____

Date Start: _____ Date Stop: _____

Time Start: _____ Time Stop: _____

Device No.'s: _____

Date Start: _____ Date Stop: _____

Time Start: _____ Time Stop: _____

Device No.'s: _____

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

RADON SCREENING SURVEY – FOLLOW-UP WESTBROOK ELEMENTARY SCHOOL

5110 Allan Terrace, Bethesda, Maryland 20816

EXECUTIVE SUMMARY

Date of Test Report:	2/22/16
Round of Testing:	Initial Follow-up Post Remediation
# Rooms Tested	7
# Rooms ≥ 4.0 pCi/L:	0
Low Value:	<0.3
High Value:	3.5
Confirmed Rooms ≥ 4.0 pCi/L US EPA Action Level	None

Summary of Sampling Events ≥ 4.0 pCi/L

Room	Result (pCi/L) 1/6/16	Result (pCi/L) 2/22/16	Average Result (pCi/L)
103	3.6	3.5	3.6
104	3.9	2.7	3.3
200	3.4	1.7	2.6
204	4.6	2.3	3.5
205	4.4	2.7	3.6
200A	3.3	2.1	2.7
200D	3.5	1.8	2.7

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

MCPS RADON TESTING

Executive Summary: Westbrook Elementary School

Date of Test Report:	2/22/2016
Round of Testing:	Initial Follow-up Post Remediation
# Rooms Tested:	7
# Rooms ≥ 4.0 pCi/L:	0
Low Value:	< 0.3
High Value:	3.5

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

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February 22, 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 # 12146341.25

Location: Westbrook Elementary School
5110 Allan Terrace
Bethesda, MD 20816

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 Westbrook Elementary School, located at 5110 Allan Terrace in Bethesda, Maryland 20816 (subject site).

Scope of Services:

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

KCI visited the site on January 19, 2016 and deployed twelve (12) activated charcoal (AC) radon test kits. KCI deployed radon test kits in frequently-occupied ground contact rooms, and other areas, (if applicable) in accordance with AARST guidance. A floor plan map of the building with the test locations is included as Attachment A of this report.

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

KCI returned to the site on January 22, 2016 to retrieve the radon sampling test kits. KCI shipped all radon tests to Accustar Labs for analysis by gamma-ray spectroscopy. Accustar Labs is a NRSB certified analytical laboratory for radon analysis (certification # ARL0007) located at 929 Mount Zion Road,

Lebanon, Pennsylvania.

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 ≤ 65° F.

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

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

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

Results:

The results of the radon test analysis indicated the following:

Radon Concentration	Room	Result
≥4.0 piC/L	none	n/a
<4.0 piC/L	See Attachment B	

Notes:
D- Duplicate sample

The field blank, office blank, and lab transit blanks had test results of less or equal to 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 (410) 316-7800.

Sincerely,

James M. Moulsdale
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		
Westbrook Elementary School		
Test Period: 01/19/16-01/22/16		
Kit Number	**Room / Area**	**Result**
3028963	103	3.5
3028968	104	2.7
3028991	200	1.7
3028962	204	2.3
3028967	205	2.7
3028961	200A	2.1
3028980	200D	1.8

Table Note:
* Missing or Compromised Sample

Radon Testing Results		
Westbrook Elementary School		
Test Period: 01/19/16-01/22/16		
Kit Number	**QC Type**	**Result**
3028965	D (200)	2.6
3028981	D (200D)	1.9
3028964	D (205)	2.2
3028966	FB (204)	0.4
3028979	OB (0)	<0.4

Table Note:
* Missing or Compromised Sample

ATTACHMENT C

Laboratory Analytical Results

AccuStar
Professional Radon Laboratory Services Since 1991

Radon in Air

NRPP 10511AL
NRSB ARL0007

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

Laboratory Report for:

KCI Technologies
936 Ridgebrook Rd
Sparks MD 21152

Property Tested:

Westbrook Elementary School
5110 Allan Terrace
Bethesda MD 20816

Log Number	Device Number	Test Exposure Duration:		Area Tested	Result (pCi/L)
3010603	3028962	01/19/2016 12:31 pm	01/22/2016 9:07 am	Room 204 Second Floor	2.3
3010604	3028966	01/19/2016 12:31 pm	01/22/2016 9:07 am	Room 204 Second Floor	0.4
3010605	3028967	01/19/2016 12:40 pm	01/22/2016 9:08 am	Room 205 Second Floor	2.7
3010606	3028964	01/19/2016 12:40 pm	01/22/2016 9:08 am	Room 205 Second Floor	2.2
3010607	3028991	01/19/2016 12:44 pm	01/22/2016 9:02 am	Room 200 Second Floor	1.7
3010608	3028965	01/19/2016 12:44 pm	01/22/2016 9:02 am	Room 200 Second Floor	2.6
3010609	3028961	01/19/2016 12:47 pm	01/22/2016 9:03 am	Room 200A Second Floor	2.1
3010610	3028982	01/19/2016 12:55 pm	01/22/2016 9:05 am	Room 200D Second Floor	1.8
3010611	3028981	01/19/2016 12:55 pm	01/22/2016 9:05 am	Room 200D Second Floor	1.9
3010612	3028963	01/19/2016 1:02 pm	01/22/2016 9:12 am	Room 103 First Floor	3.5

Comment: A copy of this report was emailed to james.moulsdale@kci.com.

Distributed by: KCI Technologies, Inc.

Date Received: 01/28/2016 Date Logged: 01/28/2016 Date Analyzed: 01/28/2016 Date Reported: 01/28/2016

Report Reviewed By: _____ Report Approved By: _____

Carolyn D. Koke, President, AccuStar Labs

Disclaimer:

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

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.

AccuStar
Professional Radon Laboratory Services Since 1984

Radon in Air

NRPP 10511AL
NRSB ARL0007

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

Laboratory Report for:

KCI Technologies
936 Ridgebrook Rd
Sparks MD 21152

Property Tested:

Westbrook Elementary School
5110 Allan Terrace
Bethesda MD 20816

Log Number	Device Number	Test Exposure Duration:		Area Tested	Result (pCi/L)
3010613	3028968	01/19/2016 1:05 pm	01/22/2016 9:15 am	Room 104 First Floor	2.7
3010614	3028979	01/19/2016 1:06 pm	01/22/2016 9:30 am	Room OB First Floor	<0.4

Comment: A copy of this report was emailed to james.moulsdale@kci.com.

Distributed by: KCI Technologies, Inc.

Date Received: 01/28/2016 Date Logged: 01/28/2016 Date Analyzed: 01/28/2016 Date Reported: 01/28/2016

Report Reviewed By: _____ Report Approved By: _____

Carolyn D. Koke, President, AccuStar Labs

Disclaimer:

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

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.

Return canisters for analysis to:
AccuStar Labs
929 Mt. Zion Rd., Lebanon, PA 17046
800-523-4964

RECEIVED JAN 27 2016

AccuStar Labs – Lebanon, PA
INFORMATION FORM - Large Buildings - Projects - Apartments

Instructions on back of form
Read instructions carefully
Discrepancies will invalidate tests

Do not use this form in New Jersey or Florida
Call for correct forms.

Test Site Info

Name of Building/Project or Owner: Westbrook Elementary School 1 of 2

Site Address: 5110 Allan Terrace

City: Bethesda State: MD Zip: 20816 County: Montgomery

Projects Contact Name: Jon Coale Phone: 410-599-3826 Email: James.Moulsdale@kci.com

Multi-Page Report Y-N

	Detector Serial#	ROOM NAME & NUMBER - LOCATION OF DETECTOR IN ROOM (indicate duplicates and blanks)		Floor	Start Date	Start Time Include AM/PM	pm Stop Date	Stop Time Include AM/PM	LAB USE ONLY Wgt. Gain	LAB USE ONLY pCi/L
3	3028962	Rm 204	3010603	2	11/9/16	~~9:07am~~ 12:07 pm	9:07am	9/22/16		DA
9	8966	204	3010604	2		12:31 Pm	9:07am	9/22/16		
10	8967	205	3010605	2		12:40	9/22/16	9:08		
11	8964	205	3010606	2		12:40		9:08		
12	8991	200	3010607	2		12:44		9:02		
1	8965	200	3010608	2		12:44		9:02		
2	8961	200A	3010609	2		12:47		9:03		
3	8982	200D	3010610	2		12:55		9:05		
9	8981	200D	3010611	2		12:55		9:05		
10	8963	103	3010612	1		1:02		9:13		

Structure Type: (circle one or more) Basement - Crawlspace - Other

Test Purpose: (Circle all that apply) Initial Screening - Follow Up Test - Post Mitigation - Real Estate - Other

Building Type: (Circle One) Residential - Non Residential Private Day Care - Private School Day Care in Public School - Public School

NO TYPE

Both Placed by and Retrieved by signatures are required

Certified Testers Provide #

Canisters placed by _____ #_____

Canisters retrieved by _____ #_____

Owner waives confidentiality by signing here _____ Date _____

Were general operating conditions maintained? Yes - No explain if NO

Were closed building conditions maintained? Yes - No explain if NO

Normal Temp. Yes - No

1/28/2016

Send Results To:

Company Name: KCI Tech Attention: James Moulsdale

Address: 936 Ridgebrook Rd

City: Sparks State: MD Zip: 21152

Phone: Fax:

EMAIL Results to: James.Moulsdale@kci.com

Make sure information is complete and correct.
If a recalculation is requested there is a $10.00 recalc fee PER Canister.

Mailing: PO Box 990 Jonestown, PA 17038
Shipping: 929 Mt Zion Road, Lebanon, PA 17
800-523-4964 fax 717-274-5662
NEHA 1051 AL NRSB ARL 0007

KCI Technologies, Inc.
3010603 **3028962** ACPC275B EXP12/31/2018

Return canisters for analysis to:
AccuStar Labs
929 Mt. Zion Rd., Lebanon, PA 17046
800-523-4964

RECEIVED JAN 27 2016

AccuStar Labs – Lebanon, PA
INFORMATION FORM - Large Buildings - Projects - Apartments

Instructions on back of form
Read instructions carefully
Discrepancies will invalidate tests

Do not use this form in New Jersey or Florida
Call for correct forms.

Test Site Info

Name of Building/Project or Owner: Westbrook ES 2 of 2

Site Address: 5110 Allan Terrace

City: Bethesda State: MD Zip: 20816 County: Montgomery

Projects Contact Name: Jan Cook Phone: 410-599-3826 Email: James.Moulsdale@kci.com

Multi-Page Report Y-N

Detector Serial#	ROOM NAME & NUMBER - LOCATION OF DETECTOR IN ROOM (indicate duplicates and blanks)	Floor	Start Date	Start Time (include AM/PM)	Stop Date	Stop Time (include AM/PM)	LAB USE ONLY Wgt. Gain	LAB USE ONLY pCi/L
3028968	104 3010613	1	1/19/16	1:05pm	1/22/16	9:15 am	Dupe	2.9
8979	OB 3010614	1	1/19/16	1:06pm	1/22/16	9:30 am		2.4

No Wgt Gain on 3028-OB

1/28/2016
KCI Technologies, Inc.
3010613 **3028968** ACPC275B EXP12/31/2018

1/28/2016
KCI Technologies, Inc.
3010614 **3028979** ACPC275B EXP12/31/2018

Structure Type: (circle one or more) Basement - Crawlspace - Slab on Grade - Other

Test Purpose: (Circle all that apply) Initial Screening - Follow Up Test - Post Mitigation - Real Estate - Other

Building Type: (Circle One) Residential - Non Residential; Private Day Care - Private School; Day Care in Public School - Public School

Both Placed by and Retrieved by signatures are required

Certified Testers Provide #

Canisters placed by _____ #_____

Canisters retrieved by _____ #_____

Owner waives confidentiality by signing here _____ Date _____

Were general operating conditions maintained? Yes - No explain if NO

Were closed building conditions maintained? Yes - No explain if NO

Normal Temp Yes - No
Normal Humidity Yes - No
Windy Y-N Rainy Y-N

Send Results To:

Company Name: KCI Tech Attention: James Moulsdale

Address: 936 Ridgebrook rd

City: Sparks State: MD Zip: 21152

Phone: 410-599-3826 Fax:

EMAIL Results to:

Make sure information is complete and correct.
If a recalculation is requested there is a $10.00 recalc fee PER Canister.

Mailing: PO Box 990 Jonestown, PA 17038
Shipping: 929 Mt Zion Road, Lebanon, PA 17046
800-523-4964 fax 717-274-5662
NEHA 10511AL NRSB AAL 0007

AccuStar
Professional Radon Laboratory Services Since 1984

Radon in Air

NRPP 10511AL
NRSB ARL0007

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

Laboratory Report for:

KCI Technologies
936 Ridgebrook Rd
Sparks MD 21152

Property Tested:

MCPS
Transit Blanks

Log Number	Device Number	Test Exposure Duration:		Area Tested	Result (pCi/L)
3010588	3028953	01/19/2016 1:00 pm	01/22/2016 9:30 am	1	< 0.4
3010589	3028955	01/19/2016 1:00 pm	01/22/2016 9:30 am	2	< 0.4
3010590	3028954	01/19/2016 1:00 pm	01/22/2016 9:30 am	3	< 0.4
3010591	3028997	01/19/2016 1:00 pm	01/22/2016 9:30 am	4	< 0.4

Comment: AMENDED REPORT for 3028953-8955, 3028997 on 2/22/16 to add all missing information from the blank datasheet. A copy of this report was emailed to james.moulsdale@kci.com.

Distributed by: KCI Technologies, Inc.

Date Received: 01/27/2016 Date Logged: 01/27/2016 Date Analyzed: 01/28/2016 Date Reported: 01/28/2016

Report Reviewed By: Crystal Bates Report Approved By: Carolyn D. Koke

Carolyn D. Koke, President, AccuStar Labs

Disclaimer:

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

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.

Return canisters for analysis to:
AccuStar Labs
929 Mt. Zion Rd., Lebanon, PA 17046
800-523-4964

RECEIVED JAN 27 2016

AccuStar Labs – Lebanon, PA
INFORMATION FORM - Large Buildings - Projects - Apartments

Instructions on back of form
Read instructions carefully
Discrepancies will invalidate tests

Do not use this form in New Jersey or Florida Call for correct forms.

Test Site Info

Name of Building/Project or Owner: Transit
Site Address: Transit
City: _____ State _____ Zip _____ County _____
Projects Contact Name: Jon Coale Phone: _____ Email: _____

Multi-Page Report Y-N

	Detector Serial#	ROOM NAME & NUMBER - LOCATION OF DETECTOR IN ROOM (indicate duplicates and blanks)		Floor	Start Date	Start Time Include AM/PM	Stop Date	Stop Time Include AM/PM	LAB USE ONLY Wgt. Gain	LAB USE ONLY pCi/L
12	3028953	Transit	3010588	1	1/19/16	9:00am	1/22/16	9:30am		<0.4
1	8955	Transit	3010589	1	1/19/16	"	"	"		<0.4
2	8954	Transit	3010590	1	1/19/16	"	"	"		<0.4
3	8997	Transit	3010591	1	1/19/16	"	"	"		<0.4

1/27/2016

KCI Technologies, Inc.
3010588 **3028953** ACPC275B EXP12/31/2018

Structure Type: (circle one or more) Basement - Crawlspace - Slab on Grade - Other

Test Purpose: (Circle all that apply) Initial Screening - Follow Up Test - Post Mitigation - Real Estate - Other

Building Type: (Circle One) Residential - Non Residential; Private Day Care - Private School; Day Care in Public School - Public School

Both Placed by and Retrieved by signatures are required Certified Tester's ID #

Canisters placed by _____ #_____

Canisters retrieved by _____ #_____

Owner waives confidentiality by signing here _____ Date 1/22/16

Were general operating conditions maintained? Yes - No explain if NO

Were closed building conditions maintained? Yes - No explain if NO

Normal Temp. Yes - No
Normal Humidity Yes - No
Windy Y-N Rainy Y-N

Send Results To:

Company Name: KCI Tech Attention: James Moulsdale
Address: 936 Ridgebrook
City: Sparks State: MD Zip 21152
Phone: 410-584-3826 Fax:
EMAIL Results to: James.Moulsdale@kci.com

Make sure information is complete and correct.
If a recalculation is requested there is a $10.00 recalc fee PER Canister.

Mailing: PO Box 990 Jonestown, PA 17038
Shipping: 929 Mt Zion Road, Lebanon, PA 17046
800-523-4964 fax 717-274-5662
NEHA 10511AL NRSB ARL 0007

EXPOSURE IN BOWSER-MORNER RADON CHAMBER

CLIENT KCF Technologies Inc. Job Number 173618

NOMINAL Conditions: Radon Conc 95.2 pCi/L Rel. Hum 49.1 % Temp. 72.0 F

Date Start: 1/23/16 Date Stop: 1/25/16	Date Start: _____ Date Stop: _____
Time Start: 0821 Time Stop: 0821	Time Start: _____ Time Stop: _____
Device No.'s: (6) Char. Cans -	Device No.'s: _____
3028985 thru 3028990	_____
_____	_____
E2 LCPT	_____
Date Start: _____ Date Stop: _____	Date Start: _____ Date Stop: _____
Time Start: _____ Time Stop: _____	Time Start: _____ Time Stop: _____
Device No.'s: _____	Device No.'s: _____
_____	_____
_____	_____
_____	_____
Date Start: _____ Date Stop: _____	Date Start: _____ Date Stop: _____
Time Start: _____ Time Stop: _____	Time Start: _____ Time Stop: _____
Device No.'s: _____	Device No.'s: _____
_____	_____
_____	_____
_____	_____

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

AccuStar
Professional Radon Laboratory Services Since 1984

Radon in Air

NRPP 10511AL
NRSB ARL0007

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

Laboratory Report for:

KCI Technologies
936 Ridgebrook Rd
Sparks MD 21152

Property Tested:

MCPS
Radon Spike Sample Laboratory Results

Log Number	Device Number	Test Exposure Duration:		Area Tested	Result (pCi/L)
3010551	3028985	01/23/2016 8:20 am	01/25/2016 8:20 am	1 First Floor	24.2
3010552	3028986	01/23/2016 8:20 am	01/25/2016 8:20 am	2 First Floor	25.7
3010553	3028987	01/23/2016 8:20 am	01/25/2016 8:20 am	3 First Floor	23.8
3010554	3028988	01/23/2016 8:20 am	01/25/2016 8:20 am	4 First Floor	23.3
3010555	3028989	01/23/2016 8:20 am	01/25/2016 8:20 am	5 First Floor	24.0
3010556	3028990	01/23/2016 8:20 am	01/25/2016 8:20 am	6 First Floor	24.4

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.

Comment: A copy of this report was emailed to james.moulsdale@kci.com.

Distributed by: KCI Technologies, Inc.

Date Received: 01/27/2016 Date Logged: 01/27/2016 Date Analyzed: 01/28/2016 Date Reported: 01/28/2016

Report Reviewed By: _____ Report Approved By: _____

Carolyn D. Roke, President, AccuStar Labs

Disclaimer:

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

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.

Return canisters for analysis to:
AccuStar Labs
929 Mt. Zion Rd., Lebanon, PA 17046
800-523-4964

RECEIVED JAN 27 2016

AccuStar Labs – Lebanon, PA
INFORMATION FORM - Large Buildings - Projects - Apartments

Instructions on back of form
Read instructions carefully
Discrepancies will invalidate tests

Test Site Info

Name of Building/Project or Owner: MCPS
Site Address: 850 Hungerford dr
City: Rockville MD State: MD Zip: 20850 County: Montgomery
Projects Contact Name: James Moulsdale Phone: 410-891-1842 Email: James.moulsdale@kci.com

Do not use this form in New Jersey or Florida Call for correct forms.

Multi-Page Report Y-N

Detector Serial#	ROOM NAME & NUMBER - LOCATION OF DETECTOR IN ROOM (indicate duplicates and blanks)		Floor	Start Date	Start Time Include AM/PM	Stop Date	Stop Time Include AM/PM	LAB USE ONLY Wgt. Gain	LAB USE ONLY pCi/L
3028985	1	3010551	1	1/23/16	08:20	1/25/16	08:20		DA
3028986	2	3010552	1	↓	↓	↓	↓		↓
3028987	3	3010553	1						
3028988	4	3010554	1						
3028989	5	3010555	1						
3028990	6	3010556	1	↓	↓	↓	↓		↓

Structure Type: (circle one or more) Basement - Crawlspace - Slab on Grade - Other

Test Purpose: (Circle all that apply) (Initial Screening) - Follow Up Test - Post Mitigation - Real Estate - Other

Building Type: (Circle One) Residential - Non Residential; Private Day Care - Private School; Day Care in Public School - (Public School)

Both Placed by and Retrieved by signatures are required

Canisters placed by: James Moulsdale Certified Testers Provide # #

Canisters retrieved by: James Moulsdale #

Owner waives confidentiality by signing here _____ Date _____

Were general operating conditions maintained? (Yes) - No explain if NO

Were closed building conditions maintained? (Yes) - No explain if NO

Normal Temp. (Yes) - No

Normal Humidity (Yes) - No

Windy Y-(N) Rainy Y-(N)

Send Results To:

Company Name: KCT Technologies Inc Attention: James Moulsdale
Address: 936 Ridgebrook Rd
City: Sparks MD 21152 State: Zip
Phone: 410-891-1842 Fax:
EMAIL Results to: James.moulsdale@kci.com

1/27/2016

KCI Technologies, Inc.

3010551 **3028985** ACPC275B EXP12/31/2018

Make sure information is complete and correct.
If a recalculation is requested there is a $10.00 recalc fee PER Canister.

Mailing: PO Box 990 Jonest
Shipping: 929 Mt Zion Road, Lel
800-523-4964 fax 717-2

NEHA 10511AL NRSB ARL 0007

Revision 5
4/2015

KCI TECHNOLOGIES

ENGINEERS • PLANNERS • SCIENTISTS • CONSTRUCTION MANAGERS

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

MCPS RADON TESTING

Executive Summary: Westbrook Elementary School

Date of Test Report:	3/1/2016 (Rev 1)
Round of Testing:	Initial Follow-up Post Remediation
# Rooms Tested:	28
# Rooms ≥ 4.0 pCi/L:	2
Low Value:	< 0.3
High Value:	4.6

Rooms with results ≥ 4.0 pCi/L:
204 (4.6 pCi/L), 205 (4.4 pCi/L)

Project Status:
Initial testing completed; re-test needed for results ≥ 4.0 pCi/L.

KCI TECHNOLOGIES

ENGINEERS • PLANNERS • SCIENTISTS • CONSTRUCTION MANAGERS

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

March 1, 2016 (Rev 1)

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

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

Location: Westbrook Elementary School
5110 Allan Terrace
Bethesda, MD 20816

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 Westbrook Elementary School, located at 5110 Allan Terrace in Bethesda, Maryland 20816 (subject site).

Scope of Services:

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

KCI visited the site on December 15, 2016 and deployed thirty-seven (37) 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 ≤ 65° F.

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

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

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

Results:

The results of the radon test analysis indicated the following:

Radon Concentration	Room	Result
≥4.0 piC/L	204	4.6
	205	4.4
<4.0 piC/L	See Attachment B	

Notes:
D- Duplicate sample

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

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

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

Sincerely,

James M. Moulsdale
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		
Westbrook E.S		
Test Period: 12/15/15-12/18/15		
Kit Number	**Room / Area**	**Result**
7704042	103	3.6
7704029	104	3.9
7704026	105	1.9
7704022	106	0.9
7704046	114	< 0.3
7704012	116	< 0.3
7704028	120	0.6
7704021	127	2.4
7704031	128	2.1
7704011	129	1.3
7704040	130	1.2
7704002	200	3.4
7704027	204	4.6
7704003	205	4.4
7704010	211	1.4
7704240	231	0.7
7704045	302	2.0
7704032	200A	3.3
7704004	200D	3.5
7704007	B06	< 0.3
7704236	B08	1.0
7704034	B09	0.7
7704237	B11	< 0.3
7704221	B14	0.5
7704225	B14	0.9
7704232	B14A	0.8
7704222	B17	1.8
7704235	B17	2.0
7704227	B18B	1.5
7704223	B18D	1.2

Table Note:
* Missing or Compromised Sample

Radon Testing Results		
Westbrook E.S		
Test Period: 12/15/15-12/18/15		
Kit Number	**QC Type**	**Result**
7704233	D (103)	3.1
7704001	D (106)	0.7
7704035	D (127)	2.2
7704234	D (B17)	2.1
7704030	FB (103)	< 0.3
7704039	FB (127)	< 0.3
7708208	OB (OFFICE BLANK)	< 0.3

Table Note:
* Missing or Compromised Sample

ATTACHMENT C

Laboratory Analytical Results

December 30, 2015

** LABORATORY ANALYSIS REPORT **

Radon test result report for:

WESTBROOK E.S
MAIN

Kit #	Room Id	Started	Ended	pCi/L	Analyzed
7704030	103	2015-12-15 @ 3:00 pm	2015-12-18 @ 10:00 am	< 0.3	2015-12-22
7704042	103	2015-12-15 @ 3:00 pm	2015-12-18 @ 10:00 am	3.6 ± 0.4	2015-12-22
7704233	103	2015-12-15 @ 3:00 pm	2015-12-18 @ 10:00 am	3.1 ± 0.4	2015-12-22
7704029	104	2015-12-15 @ 3:00 pm	2015-12-18 @ 10:00 am	3.9 ± 0.4	2015-12-22
7704026	105	2015-12-15 @ 3:00 pm	2015-12-18 @ 10:00 am	1.9 ± 0.4	2015-12-22
7704022	106	2015-12-15 @ 3:00 pm	2015-12-18 @ 10:00 am	0.9 ± 0.3	2015-12-22
7704001	106	2015-12-15 @ 3:00 pm	2015-12-18 @ 10:00 am	0.7 ± 0.3	2015-12-22
7704046	114	2015-12-15 @ 3:00 pm	2015-12-18 @ 10:00 am	< 0.3	2015-12-22
7704012	116	2015-12-15 @ 3:00 pm	2015-12-18 @ 10:00 am	< 0.3	2015-12-22
7704028	120	2015-12-15 @ 3:00 pm	2015-12-18 @ 10:00 am	0.6 ± 0.3	2015-12-22
7704021	127	2015-12-15 @ 2:00 pm	2015-12-18 @ 10:00 am	2.4 ± 0.4	2015-12-22
7704035	127	2015-12-15 @ 2:00 pm	2015-12-18 @ 10:00 am	2.2 ± 0.4	2015-12-22
7704039	127	2015-12-15 @ 2:00 pm	2015-12-18 @ 10:00 am	< 0.3	2015-12-22
7704031	128	2015-12-15 @ 2:00 pm	2015-12-18 @ 10:00 am	2.1 ± 0.4	2015-12-22
7704011	129	2015-12-15 @ 2:00 pm	2015-12-18 @ 10:00 am	1.3 ± 0.3	2015-12-22
7704040	130	2015-12-15 @ 2:00 pm	2015-12-18 @ 10:00 am	1.2 ± 0.3	2015-12-22
7704002	200	2015-12-15 @ 4:00 pm	2015-12-18 @ 11:00 am	3.4 ± 0.4	2015-12-22
7704032	200A	2015-12-15 @ 4:00 pm	2015-12-18 @ 11:00 am	3.3 ± 0.4	2015-12-22
7704004	200D	2015-12-15 @ 4:00 pm	2015-12-18 @ 10:00 am	3.5 ± 0.4	2015-12-22
7704027	204	2015-12-15 @ 2:00 pm	2015-12-18 @ 11:00 am	4.6 ± 0.5	2015-12-22
7704003	205	2015-12-15 @ 2:00 pm	2015-12-18 @ 11:00 am	4.4 ± 0.4	2015-12-22
7704010	211	2015-12-15 @ 3:00 pm	2015-12-18 @ 10:00 am	1.4 ± 0.4	2015-12-22
7704240	231	2015-12-15 @ 4:00 pm	2015-12-18 @ 10:00 am	0.7 ± 0.3	2015-12-22
7704045	302	2015-12-15 @ 2:00 pm	2015-12-18 @ 11:00 am	2.0 ± 0.3	2015-12-22
7704007	B06	2015-12-15 @ 4:00 pm	2015-12-18 @ 10:00 am	< 0.3	2015-12-22
7704236	B08	2015-12-15 @ 4:00 pm	2015-12-18 @ 10:00 am	1.0 ± 0.3	2015-12-22
7704034	B09	2015-12-15 @ 4:00 pm	2015-12-18 @ 10:00 am	0.7 ± 0.3	2015-12-22
7704237	B11	2015-12-15 @ 4:00 pm	2015-12-18 @ 10:00 am	< 0.3	2015-12-22
7704221	B14	2015-12-15 @ 3:00 pm	2015-12-18 @ 10:00 am	0.5 ± 0.3	2015-12-22
7704225	B14	2015-12-15 @ 3:00 pm	2015-12-18 @ 10:00 am	0.9 ± 0.3	2015-12-22
7704232	B14A	2015-12-15 @ 3:00 pm	2015-12-18 @ 10:00 am	0.8 ± 0.3	2015-12-22
7704222	B17	2015-12-15 @ 3:00 pm	2015-12-18 @ 10:00 am	1.8 ± 0.4	2015-12-22
7704234	B17	2015-12-15 @ 3:00 pm	2015-12-18 @ 10:00 am	2.1 ± 0.4	2015-12-22
7704235	B17	2015-12-15 @ 3:00 pm	2015-12-18 @ 10:00 am	2.0 ± 0.3	2015-12-22
7704227	B18B	2015-12-15 @ 3:00 pm	2015-12-18 @ 10:00 am	1.5 ± 0.4	2015-12-22
7704223	B18D	2015-12-15 @ 3:00 pm	2015-12-18 @ 10:00 am	1.2 ± 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 30, 2015

** LABORATORY ANALYSIS REPORT **

Radon test result report for:

WESTBROOK E.S
OFFICE BLANK

Kit #	Room Id	Started	Ended	pCi/L	Analyzed
7708208	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

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

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, 7706211, 7706366, 7706380, 7706381 F3 Left	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: _____
Date Start: _____ Date Stop: _____	Date Start: _____ Date Stop: _____
Time Start: _____ Time Stop: _____	Time Start: _____ Time Stop: _____
Device No.'s: _____	Device No.'s: _____

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

KCI TECHNOLOGIES

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

April 19, 2010

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

Re: Radon Evaluation- Westbrook Elementary

Dear Mr. Yarup:

Environmental radon testing has been completed in room 12 of Westbrook Elementary. A film badge dosimeter was placed in room 12 after radon remediation actions were completed in the school. Previously, an elevated radon level, 5.9 pico curries per liter (pCi/l) of air, was detected in room 12 on April 6, 2009.

The April 2010 radon concentration was less than the analytical detection limit of 0.5 pCi/l, below the EPA recommended level of 4.0 pCi/l.

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

Sincerely,

Michael A. Cecil, CIH

Division of Maintenance

May 15, 2009

INFORMATION PAPER

SUBJECT: Radon Survey Update, Westbrook Elementary School (ES)

Purpose: To provide results of long-term radon testing and provide an implementation plan for radon mitigation at Westbrook ES.

Background: In follow-up to elevated short-term radon testing results (see attached; Westbrook Radon Report_2_10_09) found in the Main Office and Room 12, MCPS conducted long-term radon testing to confirm the radon levels at these locations. Because radon levels tend to vary from day to day, EPA suggests conducting long-term testing if short-term testing reveals radon levels above the EPA's recommended action guideline of 4 pCi/L (Pico Curies per Liter).

Findings:
M.A. Cecil & Associates, an independent environmental consulting firm, conducted long-term testing (see attached; MCPS Westbrook Radon_4_28_09) in the Main Office and Room 12 from February 27, 2009 to April 6, 2009. The detected long-term radon concentrations were 2.8 pCi/L in the Main Office and 5.9 pCi/L in Room 12.

While the level in Room 12 is above EPA's recommended guideline of 4 pCi/L (a level that suggests mitigation action may need to be taken), EPA protocols do not call for the relocation of students or personnel from the identified area.

Radon Mitigation Plan:
As mentioned, when long-term radon testing confirms elevated radon levels, EPA suggests some form of response action or mitigation plan. To that end, MCPS has hired the services of Radon Control Professionals (RCP), Inc. from Reston, Va. RCP is a licensed and certified radon mitigation company (www.radonremediation.com) which unconditionally guarantees that their radon mitigation system will reduce radon levels below 4 pCi/L.

According to RCP, the on-site diagnostic analysis (one day) and installation of the mitigation system (~one day) takes approximately two days to complete. The radon mitigation system to be installed by RCP is known as sub-slab depressurization. To minimize disruption of school activities, this work can be scheduled around the school calendar.

To demonstrate effective radon mitigation, RCP will conduct post-mitigation radon testing as part of their standard protocol. I will forward these testing results upon my receipt.

As the Environmental Safety Coordinator for the MCPS Indoor Air Quality Office, I will continue to communicate with you as we implement our radon mitigation plan.

If you have any other questions or concerns, please feel free to contact me at 301-926-4317 regarding this matter. Thank you.

Sean Yarup, MPH
Environmental Safety Coordinator

RADON CONTROL PROFESSIONALS, INC.
2510 Soapstone Dr.
Reston, VA 20191
(703) 471-9459
FAX (703) 620-0028
www.radonremediation.com

To: Montgomery County Public Schools May 14, 2009

Attn: Sean Yarup

Re: Radon Remediation Cost Proposal
Westbrook Elementary – Room 12

I. Introduction:

We are the company that has remediated all of Montgomery County schools and the only radon remediation company comprised of Masters and PhD degreed scientists. We have developed proprietary methods of diagnostic analyses and remediation to insure that remediation is initially successful (http://www.radonremediation.com/DIAGNOSTICS.html , the lower right diagram is a Montgomery County school). Based on the results of radon test results and your faxed site plan we are pleased to submit a proposal for the radon remediation of Room 12 at Westbrook Elementary School. The first of two phases will be to perform diagnostic analyses to design the correct system to be installed in the second phase.

II. Diagnostics:

A. Sub-slab air flow permeability:

Two 1/2" holes are drilled through the slab at appropriate distances apart. By applying a known negative pressure to one hole and measuring the differential pressure drop with a micromanometer at the known distance from the other hole, the magnitude of sub-slab air flow permeability can be determined. This data in turn allows the determination of the area of slab environment that can be remediated with sub-slab depressurization and the exhaust fan capacities and duct pipe size to use based upon both empirical data and theoretical fluid mechanical considerations. This method also enables the determination of interior footing locations.

B. Soil radon measurements:

We have discovered that radon sources are either parallel to the bedrock orientation or, less often, parallel to cross-fracture trends. Soil radon measurements need to be taken and coupled with site specific geology to contour the soil radon concentration gradients so that system piping can be located directly over the radon sources, thus minimizing the number of sub-slab depressurization systems and maximizing effectiveness. This is especially important in an older school where there is poor sub-slab air flow permeability due to lack of gravel aggregate and even high-suction fans can only pull radon from a small area under the slab through the soil. Therefore it is imperative to locate and penetrate the linear geologic source.

C. Block wall radon measurements:

When block walls exist, it is appropriate to measure the radon levels of the interior of the wall compared to the sub-slab radon concentrations to determine if the block walls are contributing to the indoor radon levels and need to have small PVC penetrations.

III. Guarantee:

- **RCP guarantees to reduce the average radon levels to below 4 pCi/l in the Room 12 for the life of the building as long as the exhaust fan is in working order and the builder has followed applicable codes.**
- **If any post-remediation radon test is greater than 4 pCi/l, RCP will pay for that test and perform further work at no expense until the radon is reduced to below 4 pCi/l.**
- Exhaust fan is warrantied for 5 years by the manufacturer.
- Contract is transferable to any subsequent owner.
- We use no sub-contractors and principals and technicians are certified.

IV. Cost:

Type:	Units	Unit Cost	Total
Micromanometer tests	4	$ 150	$ 600
Sub-slab radon tests	4-6	$ 200	$ 800 - $1200
Blockwall radon tests	4	$ 200	$ 800
Design	1	$ 500	$ 500
Total			$2700 - $3100

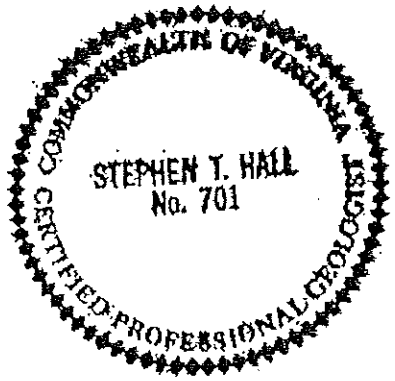
VI. Schedule:

We can schedule the diagnostic analyses within one week of authorization and they can be performed in 1 working day. The design and remediation proposal will be submitted within 2-3 working days thereafter.

Please call us at (703) 471-9459, if there are any questions or to schedule the work.

RADON CONTROL PROFESSIONALS INC.

MD License #15348898
VA License #2705-015147



Stephen T. Hall, MS, PG
President
EPA RMP # 122340T
NRSB #GSS612

James Humphryes, VP

EPA RCP # 18031
NEHA #100309RMT

Accepted:_____ Date:_____

Name:_____

April 28, 2009

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

Re: Radon Evaluation- Westbrook Elementary

Dear Mr. Yarup:

Environmental radon testing has been completed in two locations in Westbrook Elementary.

Film badge dosimeters were placed in room 12 and the main office. The dosimeters were placed February 27, 2009 and retrieved on April 6, 2009. The results and are summarized in the following.

Location	Radon Concentration (pCi/l)
Room 12	5.9
Main office	2.8

The detected radon concentration in the office was below the EPA recommended level of 4.0 pico curries per liter (pCi/l) of air. The detected radon concentration in room 12 was above the level. The EPA recommends some form of a response action for areas with radon levels exceeding the recommended level.

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

Sincerely,

Michael A. Cecil, CIH

February 10, 2009

Division of Maintenance

INFORMATION PAPER

SUBJECT: Radon Survey, Westbrook Elementary School

Purpose: To provide information on a radon survey conducted at Westbrook Elementary School (ES)

Introduction: In response to parental concerns, the Indoor Air Quality (IAQ) Team conducted a radon survey for Westbrook ES. Following EPA protocols, the radon survey consisted of conducting two rounds of short-term radon sampling for the periods of 1/9/09-1/12/09 and 1/30/09-2/2/09.

Background: Radon is a ubiquitous, invisible, radioactive gas created during the natural breakdown of uranium in rocks and soils. Radon is found in outdoor air and in the indoor air of buildings of all kinds. It becomes a health issue when it seeps into buildings through foundations, where its' decay products are inhaled.

The EPA action limit for indoor radon concentrations is EPA 4 pCi/L (picoCuries per Liter). This EPA voluntary guideline recommends that a building be fixed if the radon level is 4 pCi/L or more. The average radon concentration in the indoor air of America's homes is 1.3 pCi/L. The average concentration of radon in outdoor air is 0.4 pCi/L or $1/10^{th}$ of EPA's 4 pCi/L action level. Approximately 35 percent of the homes in Montgomery County exceed the EPA suggested action level of 4pCi/L, based on almost 34,000 tests conducted through April 1995.

The Occupational Safety and Health Association (OSHA) permissible exposure limit (PEL) for worker radon exposure is 100 pCi/L, averaged over 40 hours in a consecutive seven day period.

Methodology: The IAQ Team conducted an initial screening for indoor radon testing concentrations at Westbrook ES by conducting short-term testing with activated charcoal adsorption devices (Pro Chek Test Kit; Air Chek, Inc.) on 1/9/09. Testing was conducted in accordance with manufacturer recommendations and EPA protocols. Test devices were placed in 24 rooms for at least 48 hours and at the end of the test period, sent to the manufacturer for analysis. For the initial screening, the results provided in pCi/L were compared to the EPA action limit for indoor radon concentrations. EPA action limit, a voluntary guideline developed primarily for addressing potential residential exposures, was used to evaluate the need for additional testing. Test results between 4 and 10 pCi/L should prompt non-smokers to conduct either a longer term test or short term test several months later. If still above 4 pCi/L, repairs are probably best indicated. Testing is best done during the winter months while external doors, windows, and vents are closed; winter levels are often 30-40 percent higher than warm weather readings.

Results: Historical indoor radon results conducted at Westbrook ES from 1988 to 1994 are provided in table 1 below. The results from the initial and follow up testing conducted between 1987 and 1994 were below the EPA action limit, 4 pCi/L; additional sampling and remediation work was not initiated.

Table 1 Westbrook ES Radon Results

Westbrook ES Radon Testing				
Room	**Floor level**	**Date Start**	**Date End**	**Radon Detected (pCi/L)**
Stage	Lower	2/25/94	2/28/94	2.5
#2 Kindergarten	Middle	2/17/91	3/1/91	0.5
ISM	Upper	2/17/91	1/3/91	1.5
ISM	Upper	2/17/91	1/3/91	1.4
#2 Kindergarten	Middle	2/17/91	3/1/91	3.9
#26 Music/Daycare	Middle	2/17/91	1/3/91	0.6
MPR	Lower	2/17/91	1/3/91	2.8
MPR	Lower	2/17/91	1/3/91	2.9
Stage	Lower	2/17/91	1/3/91	4.5
#11	Middle	12/28/87	12/30/87	1.3
#2	Middle	12/28/87	12/30/87	0.9
MPR	Lower	12/28/87	12/30/87	3.3
#20	Middle	12/28/87	12/30/87	1.1
#8	Middle	12/28/87	12/30/87	0.2
#6	Middle	12/28/87	12/30/87	0.2

Results: In Table 2, short-term radon test results are listed for the 24 rooms sampled between 1/9-12/09. The results indicate indoor radon concentrations in rooms twelve, thirteen, stage, MPR, kitchen, and general office were above EPA's action limit.

Table 2 Westbrook ES Radon Results 1/9-1/12/09

Westbrook ES Radon Testing			
Room	**Floor level**	**Duration**	**Radon Detected (pCi/L ± 0.2)**
General Office	Middle	1/9/2009-1/12/09	4.5
# 3 K Complement & Day Care	Middle	1/9/2009-1/12/09	2
TV Communications Lab	Middle	1/9/2009-1/12/09	1.7
Media Center	Middle	1/9/2009-1/12/09	1.7
# 18 Music & Science Lab	Middle	1/9/2009-1/12/09	0.9
# 10 Computer Lab	Middle	1/9/2009-1/12/09	1.8
# 7 Speech	Middle	1/9/2009-1/12/09	1.3
# 19 Staff Lounge	Middle	1/9/2009-1/12/09	2.1
# 21 Sp. Ed	Middle	1/9/2009-1/12/09	2.1
#23 Fourth grade	Middle	1/9/2009-1/12/09	1.7
# 25 Third grade	Middle	1/9/2009-1/12/09	1.7
# 24	Middle	1/9/2009-1/12/09	1.3
# 27 Art	Middle	1/9/2009-1/12/09	2.5
# 5 Fifth grade	Middle	1/9/2009-1/12/09	2.5
# 4 Fifth grade	Middle	1/9/2009-1/12/09	2.2
# 15 Second grade	Lower	1/9/2009-1/12/09	1.7
# 14 Second grade	Lower	1/9/2009-1/12/09	< 0.3
# 13 First grade	Lower	1/9/2009-1/12/09	5.3
# 12 First grade	Lower	1/9/2009-1/12/09	4.4
Stage	Lower	1/9/2009-1/12/09	4.2
MPR	Lower	1/9/2009-1/12/09	4.4
# 29 BSM	Lower	1/9/2009-1/12/09	3.1
Kitchen	Lower	1/9/2009-1/12/09	4.8
WOC	Lower	1/9/2009-1/12/09	2.7

Results: Based on these results, additional sampling was conducted in these rooms. The IAQ team obtained short-term radon duplicate samples for the six rooms re-sampled between 1/30/09-2/2/09. Room 14 was used a control room. The results are provided in table 3 below. The results indicate indoor radon concentrations in room twelve and general office are above EPA's action limit of 4 pCi/L.

Table 3 Westbrook ES Radon Results 1/30-2/2/09

Westbrook ES Radon Testing			
Room	**Floor level**	**Duration**	**Avg Radon Detected (pCi/L ± 0.2)**
General Office	Middle	1/30/09 - 2/2/09	4.3
# 14 Second grade	Lower	1/30/09 - 2/2/09	0.7
# 13 First grade	Lower	1/30/09 - 2/2/09	1.3
# 12 First grade	Lower	1/30/09 - 2/2/09	10.4
Stage	Lower	1/30/09 - 2/2/09	2.7
MPR	Lower	1/30/09 - 2/2/09	3.8
Kitchen	Lower	1/30/09 - 2/2/09	3.1

Recommendation

EPA's voluntary guideline for radon recommends that a building be fixed if the radon level is 4 pCi/L or more after retesting has been conducted.

- Based on the results of the retesting, the IAQ Team will work with the Division of Construction to select a certified radon professional to perform additional sampling and any necessary remediation work.

February 9, 2009

Division of Maintenance

INFORMATION PAPER

SUBJECT: Initial Radon Screening, Westbrook Elementary School (ES)

Purpose: To provide information on initial radon screening conducted at Westbrook ES.

Introduction: In response to parental concerns, the Indoor Air Quality (IAQ) Team conducted initial radon screening for Westbrook ES in January 2009.

Findings: Of the 24 rooms tested, the initial screening revealed elevated radon levels in two rooms.

Discussion and limitations of findings: According to EPA, initial radon screening (2-day short-term testing) should be used to determine where radon may be a potential problem. If radon levels are found above the recommended limit of 4.0 pCi/l, then EPA recommends that long-term testing be conducted.

Because radon levels can substantially fluctuate over a short period of time, an initial test might not be an accurate assessment of the average radon level. The long-term test, which measures radon over a 30-day period, yields a measurement that is more representative and conclusive of the radon levels in a building.

In other words, the short-term test provides a 'snapshot" view of the radon situation, whereas a long-term test shows the "big picture".

Plan of Action: The IAQ Office has hired an independent environmental consulting firm to conduct long-term radon testing (~30 days) at Westbrook ES. Upon my receipt, I will provide you with the testing report and any potential corrective measures that the IAQ Team may need to address.

Sean Yarup, MPH
Environmental Safety Coordinator
301-926-4317