



***MILLER-DRISCOLL ELEMENTARY SCHOOL  
WILTON PUBLIC SCHOOLS  
217 WOLFPIT ROAD  
WILTON, CONNECTICUT 06897***

***SCHOOL RADON TESTING***

***April 9, 2014***

***PREPARED FOR:***

***WILTON PUBLIC SCHOOLS  
395 DANBURY ROAD  
WILTON, CT 06897***

***PREPARED BY:***

***CARDNO ATC  
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***PROJECT NO. 61.38954.0020 Task 4***

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## CERTIFICATION

This report has been prepared for the exclusive use of Wilton Public Schools and is considered privileged and confidential. Photocopying of this document by parties other than those designated by the Wilton Public Schools, or use of this document for purposes other than it is intended, is prohibited.

Respectfully, submitted on April 9, 2014

**Cardno ATC**

A handwritten signature in black ink, appearing to read "Neal B. Freuden", written in a cursive style. Below the signature is a horizontal line.

Neal B. Freuden, CTDPH Radon Measurement Professional  
National Radon Proficiency Program, Certification #100894 RT

**RADON IN AIR TESTING**

**CLIENT:** Wilton Public Schools

**SCHOOL:** Miller/Driscoll Elementary School  
217 Wolfpit Road  
Wilton, CT 06897

**DATE OF TESTING:** February 19, 2014 to February 21, 2014

**RADON MEASUREMENT  
PROFESSIONAL:** Neal B. Freuden

**LICENSE NO:** National Radon Proficiency Program # 100894 RT  
Expiration: 1/31/2015

## 1. SUMMARY INFORMATION

Cardno ATC (ATC) was retained by the Wilton Public Schools to conduct monitoring for airborne radon at the Miller/Driscoll Elementary School, located at 217 Wolfpit Road, Wilton, CT. The purpose of this monitoring was to evaluate the airborne levels in comparison to the U.S. Environmental Protection Agency (EPA) recommended exposure limit of 4.0 picocuries per liter of air (pCi/L). The testing was conducted from February 19, 2014 to February 21, 2014 by Mr. Neal B. Freuden, a licensed member of the National Radon Proficiency Program as Radon Measurement Provider and a Qualified Professional for Radon Testing in Connecticut Schools. The testing was conducted in accordance with Connecticut General Statutes (CGS) § 10-220, the Connecticut Department of Public Health (CTDPH) Radon Program, and guidance of the EPA.

This report applies *only* to the following location:

### **Name and Address of School Building**

School Name: Miller/Driscoll Elementary School  
Address: 217 Wolfpit Road  
Wilton, Connecticut 06897

## 2. RADON HEALTH RISKS

### **Radon in Air**

Radon is colorless, odorless, and tasteless. Radon is the second leading cause of lung cancer, after smoking. Radon is naturally-occurring radioactive gas. It comes from the natural decay of uranium which is found in soil and rock all over the United States. Radon travels through soil and enters buildings through cracks and other holes in the foundation. Eventually, it decays into radioactive particles that can become trapped in our lungs when we breathe. As these particles decay, they release small bursts of radiation. This radiation can damage lung tissue and lead to lung cancer over the course of our lifetime.

## 3. SAMPLING METHODOLOGY

### **Radon in Air**

Sampling was conducted in all frequently occupied rooms in contact with the ground (see Appendix D for the sample location diagram). These testing locations were composed of classrooms, offices, gymnasiums, media center, conference rooms and cafeterias. Testing was conducted in accordance with the CTDPH School Radon Testing Guidance and the EPA sampling protocol. Testing was conducted during a time of HVAC heating, closed building conditions, and the absence of construction activities. Sampling was conducted with passive short-term radon testing kits utilizing a liquid scintillation radon detector(s). The test kits were placed in designated sample locations at a minimum of 20 inches off the floor, more than 1 foot from interior walls, more than 3 feet from exterior walls and more than 3 feet from exterior windows and doors. Sample canisters were opened and allowed to be exposed to the indoor atmosphere for a minimum of forty-eight hours. Upon completion of the testing, all the test devices were

sealed and transported to an EPA certified laboratory for analysis, EMSL Analytical, Inc. in Cinnaminson, NJ.

**Quality Assurance Procedures**

Ten percent (10%) of the sample locations contained a duplicate sample. Duplicates are pairs of test devices deployed in the same location, side by side (separated by 4 inches) for the same measurement period. These duplicate test devices are stored, deployed, removed and shipped to the laboratory for analysis in the same manner as the other test devices. If either of the analyses in a duplicate pairing is above the EPA recommended action level of 4.0 pCi/L, the relative percent difference (RPD) between two tests must be determined. If the allowable difference exceeds 25% the test is determined to be invalid and a new duplicate test must be run. If both test devices are below the EPA recommended action level then the RPD is not calculated, since despite any disparity each result is acceptable.

Blank samples were submitted to measure the accuracy of the testing. These blank samples were not exposed but were shipped, handled, and analyzed in the same fashion as the test kits. The blank samples were conducted in five percent (5%) of the sample locations.

Spikes are used to determine the accuracy of the normal measurement process. For each month of active radon sampling, a batch of test devices provided by ATC are exposed to a known and elevated concentration of radon gas (“spiked”) at a secondary laboratory, separate from the primary laboratory used for the analysis of the school samples. The exposed spikes are sent as normal samples to the primary laboratory. The results of analysis at the primary laboratory should have an average error of no more than 10% from the target value set by the secondary laboratory.

In the table below the February 2014 results for the quality control spike tests are presented. Spike samples were prepared at Bowser-Morner, Inc. in Dayton, OH and submitted to EMSL Analytical, Inc. in Cinnaminson, NJ in February 2014.

**TABLE 1: Spike Samples for February 2014**

<b>Device Number</b>	<b>Target Value (pCi/L)</b>	<b>Measured Value (pCi/L)</b>	<b>Error</b>
147646	26.0	25.5	1.9%
147742	26.0	24.3	6.5%
147618	26.0	23.7	8.8%
147693	26.0	23.5	9.6%
147670	26.0	26.2	0.77%
147603	26.0	26.1	0.38%

The above February 2014 batch of spike samples were satisfactory and met the quality control criteria.

**4. SAMPLE SUMMARY**

ATC conducted air testing for radon in ninety-four (94) rooms. Radon testing of classrooms, offices, gymnasiums, media center, conference rooms and cafeterias that are in contact with the ground

commenced on February 19, 2014 and was completed on February 21, 2014. The radon tests were performed using liquid scintillation radon detectors and counted on a liquid scintillation counter by EMSL Analytical, Inc. in Cinnaminson, New Jersey using approved EPA testing protocols for radon in air. The laboratory analysis results for the radon air samples ranged from 0.3 pCi/L to 1.7 pCi/L. No results were above the EPA recommended action level of 4.0 pCi/L and follow-up re-testing is not required.

Laboratory data results for all samples are found in Appendix A.

In Table 2 below, the results of the quality control duplicate tests are presented as well as the location, average radon level and relative percent difference (if applicable) for each pair of radon devices for this testing period.

**TABLE 2: Duplicates (February 19, 2014 to February 21, 2014)**

Location	Device Numbers	RADON LEVEL (pCi/Liter)			RELATIVE PERCENT DIFFERENCE (RPD, %)
		Sample	Sample Duplicate	Sample Average	
Gym #2	156792 156758	0.6	0.8	0.7	Percent Difference Not Needed (No Levels Above 4.0 pCi/Liter)
Speech/Language Therapy	157911 157904	0.5	0.5	0.5	Percent Difference Not Needed (No Levels Above 4.0 pCi/Liter)
Speech/Language /Ms. Jones	156695 156799	0.6	0.7	0.65	Percent Difference Not Needed (No Levels Above 4.0 pCi/Liter)
Pre K Office	156786 156774	0.3	0.4	0.35	Percent Difference Not Needed (No Levels Above 4.0 pCi/Liter)
Room N14	156779 153863	0.7	0.9	0.8	Percent Difference Not Needed (No Levels Above 4.0 pCi/Liter)
Room C11	157910 158157	0.5	0.7	0.6	Percent Difference Not Needed (No Levels Above 4.0 pCi/Liter)
Room S19	158181 158049	0.6	0.3	0.45	Percent Difference Not Needed (No Levels Above 4.0 pCi/Liter)
Room S9	158207 158143	0.8	0.7	0.75	Percent Difference Not Needed (No Levels Above 4.0 pCi/Liter)

Location	Device Numbers	RADON LEVEL (pCi/Liter)			RELATIVE PERCENT DIFFERENCE (RPD, %)
		Sample	Sample Duplicate	Sample Average	
Room S14	158187 157837	0.4	0.3	0.35	Percent Difference Not Needed (No Levels Above 4.0 pCi/Liter)
Psychologist	158044 158172	0.8	0.7	0.75	Percent Difference Not Needed (No Levels Above 4.0 pCi/Liter)
Principal's Office	158106 158211	0.6	0.5	0.55	Percent Difference Not Needed (No Levels Above 4.0 pCi/Liter)

The duplicate testing results were satisfactory and met the quality control criteria.

In Table 3 below, the results of the quality control blank tests are presented as well as their corresponding locations for this testing period.

**TABLE 3: Blanks (February 19, 2014 to February 21, 2014)**

Location	Device Number	Radon Level (pCi/L)
Custodial	158091	0.1
Gym #3	158219	-0.1
Room N15	158075	0.0
Open Area	156768	0.0
Room C8	158234	0.1
Media Center	158055	0.2

The blank testing results were satisfactory and met the quality control criteria.

## 5. CONCLUSION AND RECOMMENDATIONS

CTDPH recommends conducting follow-up testing if the average radon result in any room tested is equal to or greater than 4.0 pCi/L.

The laboratory analyses showed a maximum radon level of only 1.7 pCi/L in any room, which is below the EPA recommended action level of 4.0pCi/L.

Therefore, **no corrective actions need to be taken at this time.**



A copy of the complete report shall be kept in the main office of the school for parents and staff to view.

The required School Radon Testing Program Form was submitted to the Connecticut Department of Public Health. A copy of this form is in Appendix C.

**APPENDIX A**  
**LABORATORY DATA**

**APPENDIX B**  
**CONSULTANT CERTIFICATION**

**APPENDIX C**

**STATE OF CONNECTICUT RADON TESTING FORM**

**APPENDIX D**  
**SAMPLE LOCATION DRAWINGS**