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## Follow-up Radon Measurement Survey Report

Site:

**Gates Elementary School  
800 Seventh Avenue  
Aurora, Illinois 60505**

Initial Survey Dates: April 30, 2018 thru May 3, 2018  
Follow-Up Survey Dates: November 7, 2018 thru November 9, 2018

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Prepared For:

**East Aurora School District 131  
417 Fifth Street  
Aurora, Illinois 60505**


Carnow Conibear Project No. A146000151




## Follow-up Radon Measurement Survey Report

Site:

**Gates Elementary School  
800 Seventh Avenue  
Aurora, Illinois 60505**

Surveyed by:   
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Radon Measurement Professional

Report by:   
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Carnow Conibear Project No. A146000151

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## 1.0 EXECUTIVE SUMMARY

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Carnow, Conibear, & Assoc., Ltd. (Carnow Conibear) was contracted by East Aurora School District 131 to perform a radon measurement survey at the Gates Elementary School located at 800 7<sup>th</sup> Avenue in Aurora, Illinois. An initial survey was conducted on April 30, 2018 and completed on May 3, 2018 by Nicole Bennett, an Illinois Emergency Management Agency (IEMA) licensed Radon Measurement Professional (License No. RNI2016213). Following the initial survey, Carnow Conibear conducted a follow-up radon measurement survey in locations exceeding the EPA recommended radon action level of 4.0 PicoCuries per liter (pCi/L). Additional radon samples were collected from locations where device inference prevented the initial sampling from being completed. Subsequently, the follow-up sampling was initiated on November 7, 2018 and completed on November 9, 2018 by Nicole Bennett. The scope of work included short-term (two to four day) radon measurements in frequently occupied rooms with substantial ground contact. The radon sampling was performed following IEMA and the United States Environmental Protection Agency (USEPA) testing protocols for commercial and school radon measurements, the radon device manufacturer's recommendations, and Carnow Conibear's Quality Assurance Plan.

### April 30, 2018 thru May 3, 2018 (Initial Survey)

A total of seventy-three (73) radon test devices were deployed during the initial survey, including sixty-three (63) single devices, six (6) duplicates, and four (4) blanks.

### November 7, 2018 thru November 9, 2018 (Follow-up Survey)

A total of four (4) radon test devices were deployed during the follow-up survey, including three (3) single devices and one (1) duplicate.

Activated radon charcoal devices manufactured by Air Chek Inc. were utilized during the initial and follow-up radon surveys. The activated charcoal devices are passive devices containing activated carbon to measure radon. Testing was initiated on April 30, 2018 and completed on May 3, 2018. Follow-up testing was initiated on November 7, 2018 and completed on November 9, 2018.

Radon measurement results for initial testing ranged from less than (<) 0.3 to 4.6 pCi/L. Results for follow-up testing ranged from < 0.3 to 6.6 pCi/L. Both initial and follow-up radon measurement results identified areas exceeding the EPA recommended radon action level of 4.0 pCi/L. The average indoor radon concentrations are 1.3 pCi/L nationwide. The average outdoor radon concentration is 0.4 pCi/L.

Based on the radon measurement results Carnow Conibear offers the following:

- Initial and follow-up testing confirmed radon concentrations exceeded the EPA recommended radon action level of 4.0 pCi/L within the Server Room 32A.

- Develop a mitigation strategy to reduce radon concentrations starting with the simplest approach, re-evaluate thru additional radon testing to determine effectiveness, and utilize information to proceed with subsequent phases, as necessary. Additional recommendations for radon reduction options are presented in the report that follows.
- Consider contracting an IEMA licensed radon mitigation professional to design and install a remediation system to reduce radon levels. The radon mitigation professional shall be licensed by the IEMA to conduct radon mitigation in schools and commercial buildings. The radon contractor shall install the mitigation system in accordance with all requirements of 32 Illinois Administrative Code 422. The contractor shall verify the location and quantity of suction points and fans installed is adequate to remove the radon gas. Conduct post mitigation radon testing to evaluate the radon mitigation system function. The post mitigation testing shall be conducted no sooner than twenty-four (24) hours nor later than thirty (30) days following activation of the mitigation system. The post mitigation radon test shall be conducted by an IEMA licensed radon measurement professional.
- Routine follow-up radon measurement surveys are recommended every two (2) years at different seasonal times following IEMA and the USEPA testing protocols and the radon device manufacturer's recommendations.
- Additional testing is also recommended if significant changes are made to the building's structural or mechanical components.

## 2.0 BACKGROUND

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Radon is a naturally occurring, radioactive, colorless, odorless, tasteless gas produced from the decay of uranium and radium found in most soil and rock. Natural soils and rock such as granites, shales, and corals, contaminated soils from uranium processing mills, contaminated building materials, and groundwater water supplies directly from wells are a few common sources of radon. Radon can be found at some level in all indoor and outdoor air. Unlike most airborne contaminants, radon is chemically inert, or chemically inactive. As a result, it is not chemically bound or attached to other materials and can move easily through porous materials or void space.

Typically, most radon gas is generated from the surrounding soil or bedrock, pulled through the soil or rock by air pressure differentials, and enters the structure. However, radon gas can come from water, outside air, or contaminated building materials. The strength of the radon source has the biggest impact on indoor radon concentrations. The route of entry (i.e. through holes in the foundation), the building's ventilation rate, foundation type, and differences in soils beneath the building can affect the indoor radon concentrations.

The primary health effect attributed to radon exposure is lung cancer. The World Health Organization (WHO), the National Academy of Sciences, the US Department of Health and Human Services, and the EPA classify radon as known human carcinogen. The EPA states radon is the largest source of radiation exposure and risk to the general public. When radon and products of radon decay are inhaled, decay can occur while in contact with the lung prior to being expelled. Because radon is chemically inert, most inhaled radon is rapidly exhaled. However, the inhaled decay products are readily deposited in the lungs, release energy in the form of radiation causing lung tissue damage, and consequently increase the risk of lung cancer.

Radon concentrations in air are commonly expressed in picoCuries per liter (pCi/L) in the United States. An EPA national residential radon survey completed in 1991, determined the average indoor radon level is 1.3 pCi/L and the average outdoor level is about 0.4 pCi/L. The National Academy of Sciences' (NAS) latest report on radon, the Biological Effects of Ionizing Radiation (BEIR) VI Report (1999), estimates radon in indoor air causes about 21,000 lung cancer deaths each year in the United States. The EPA states that any level of radon carries some risk and there are no safe levels, and has established an action level of 4.0 pCi/L.

## **3.0 SCOPE OF WORK**

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Carnow, Conibear, & Assoc., Ltd. (Carnow Conibear) was contracted by East Aurora School District 131 to perform a radon measurement survey at the Gates Elementary School located at 800 7<sup>th</sup> Avenue in Aurora, Illinois.

The scope of work included short-term radon measurements in frequently occupied rooms with substantial ground contact. The duration of short-term measurements can range from two (2) to four (4) days. Prior to placement of the radon measurement devices a Quality Assurance Project Plan (QAPP) was developed and general observations were performed to verify test conditions, identify device placement locations, and determine structural and mechanical building components. The QAPP was created to document and describe the necessary quality assurance procedures, quality control activities, and provide a clear, concise, and complete plan for the radon measurement operations. The non-interference agreement is required by the IEMA to document an understanding of the required closed building testing conditions. Observations of test conditions verified closed building conditions were maintained at a minimum of twelve (12) hours prior to testing and throughout the measurement period. Closed building conditions are necessary for short-term radon measurements in order to stabilize the radon and radon decay product concentrations and increase the reproducibility of the measurement. Closed building conditions require windows and exterior doors on all levels be kept closed (except for normal entry and exit) during the measurement period. Closed building conditions also require the normal operation of heating, ventilating, and air conditions systems.

Initial radon test devices were deployed in sixty-three (63) locations. In addition, six (6) duplicates and four (4) blanks were utilized to measure precision and bias, and ensure quality data. Follow-up radon test devices were deployed in three (3) locations. In addition, one (1) duplicate was utilized to measure precision and bias, and ensure quality data. Radon test devices were documented in a permanent log noting the address of the building measured, a diagram of the test area noting the exact locations of all measurement devices deployed, exact start and stop times of the measurement period, a description of the device used and serial number, and the name and IEMA license number of the Radon Measurement Professional. At the end of the measurement period the radon test devices were retrieved, resealed, and mailed to the laboratory for analysis.

The radon measurement results are reported in picoCurie per liter (pCi/L). A picoCurie per liter is 2.22 atomic radon disintegrations per minute for each liter of air. The results of the radon measurements are interpreted to determine the need for additional testing and assess the quality and confidence of the measurement data. Typically, follow-up measurements will be recommended in every room with results greater than 4.0 pCi/L. The recommendation to mitigate elevated levels of radon shall not be based on the initial measurement results.

## **4.0 METHODOLOGY**

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The radon testing was performed following requirements set forth by the IEMA, USEPA, and Carnow Conibear's Quality Assurance Plan. The radon measurement survey consisted of several phases. The initial phase consisted of preliminary testing protocol, including an explanation of services, instructions to comply with closed building conditions, the development of the Quality Assurance Project Plan, and determination of the testing period. Next, general observations of the building were performed to verify test conditions, identify device placement locations, and determine structural and mechanical building components.

The measurement phase included the radon testing device placement and retrieval. Activated radon charcoal devices manufactured by Air Chek Inc. were utilized during this radon survey. The activated charcoal devices are passive devices containing activated carbon to measure radon. Radon test devices were placed in such a way to limit unintentional interference from building occupants. The measurement devices were placed at least three feet from doors, windows to the outside, at least one foot from exterior walls, at least four feet from heat sources, out of the direct flow of ventilation ducts and sunlight, and suspended in the general breathing zone. Duplicate tests were conducted for a minimum of 10% of the total radon test devices deployed to measure precision. Field blanks were submitted for a minimum of 5% of the total number of radon test devices deployed to measure background gamma radiation. Spike tests were not submitted for this survey, but are submitted for a minimum of three per 100 radon test devices or a minimum of three per year to measure laboratory accuracy. A total of seventy-three (73) initial radon test devices were deployed including sixty-three (63) single devices, six (6) duplicates, and four (4) blanks. Additionally, a total of four (4) follow-up radon test devices were deployed including three (3) single devices and one (1) duplicate. At the end of the measurement periods the radon measurement devices were retrieved, resealed, and shipped overnight to Air Chek Inc. for analysis. Air Chek Inc. calculates the radon concentration after measuring the gamma activity by the radon decay products produced from the random decay of the collected radon. The final phase consisted of interpreting the results and an assessment of the quality and confidence of the measurement data.



## **5.0 SUMMARY OF RESULTS**

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Table 1.0 Radon Measurement Device Results identify all the radon measurement devices deployed and the reported radon results. The radon measurement results are reported in picoCurie per liter (pCi/L).

The radon measurement results indicate areas tested exceeded the EPA and IEMA recommended radon action level of 4.0 pCi/L during the time of the test. No testing abnormalities were noted during the radon measurement interval. Additionally, no radon mitigation systems were observed in the building.

**Table 1.0 Radon Measurement Device Results**

**Gates Elementary School  
 800 7<sup>th</sup> Avenue  
 Aurora, Illinois 60505**

Device Location	Device Serial #	Start Date	Start Time	Stop Date	Stop Time	Result (pCi/L)	Average Result (pCi/L)	Comments
Main Office 51C	9043184	4/30/2018	5:36 PM	5/3/2018	4:30 PM	< 0.3		
Nurses Office 51A	9043185	4/30/2018	5:38 PM	5/3/2018	4:29 PM	0.7		
Office 51D	9043188	4/30/2018	5:45 PM	5/3/2018	4:35 PM	< 0.3		
Office 51G	9043186	4/30/2018	5:41 PM	5/3/2018	4:31 PM	1.2		
Copy Room 51E	9043187	4/30/2018	5:43 PM	5/3/2018	4:31 PM	1.6		
Office 51H	9043189	4/30/2018	5:47 PM	5/3/2018	4:34 PM	0.5		
Library 64A	9043190	4/30/2018	5:50 PM	5/3/2018	4:38 PM	0.8		
Library 64A	9043191	4/30/2018	5:50 PM	5/3/2018	4:38 PM	< 0.3		Duplicate RPD = 91%
Library 64A	9043192	4/30/2018	5:51 PM	5/3/2018	4:38 PM	< 0.3		
Computer Lab 64B	9043193	4/30/2018	5:53 PM	5/3/2018	4:40 PM	< 0.3		
Storage Room 67	9043194	4/30/2018	5:54 PM	5/3/2018	4:53 PM	< 0.3		
Classroom 66	9043195	4/30/2018	5:55 PM	5/3/2018	4:51 PM	< 0.3		
Classroom 69	9043196	4/30/2018	5:57 PM	5/3/2018	4:51 PM	< 0.3		
Classroom 68	9043197	4/30/2018	5:58 PM	5/3/2018	4:50 PM	< 0.3		
Classroom 71	9043198	4/30/2018	5:59 PM	5/3/2018	4:51 PM	< 0.3		
Classroom 65	9043199	4/30/2018	6:01 PM	5/3/2018	4:46 PM	< 0.3		
Classroom 64	9043200	4/30/2018	6:03 PM	5/3/2018	4:44 PM	< 0.3		
Classroom 63	9042916	4/30/2018	6:04 PM	5/3/2018	4:45 PM	< 0.3		
Classroom 63	9042917	4/30/2018	6:04 PM	5/3/2018	4:46 PM	1.0		Duplicate RPD = 136%
Classroom 62	9042918	4/30/2018	6:06 PM	5/3/2018	4:46 PM	< 0.3		

**Table 1.0 Radon Measurement Device Results**

**Gates Elementary School  
800 7<sup>th</sup> Avenue  
Aurora, Illinois 60505**

Device Location	Device Serial #	Start Date	Start Time	Stop Date	Stop Time	Result (pCi/L)	Average Result (pCi/L)	Comments
Classroom 61	9042919	4/30/2018	6:07 PM	5/3/2018	4:45 PM	0.9	-	
Classroom 60	9042920	4/30/2018	6:07 PM	5/3/2018	4:45 PM	< 0.3	-	
Mechanical Room 51I	9042921	4/30/2018	6:11 PM	5/3/2018	4:52 PM	< 0.3	-	
Music Room 51J	9042922	4/30/2018	6:12 PM	5/3/2018	4:39 PM	< 0.3	-	
Concession Area 42C	9042923	4/30/2018	6:15 PM	5/3/2018	---	---	-	Missing at time or retrieval
Concession Area 42C	9106271	11/7/2018	3:06 PM	11/9/2018	4:28 PM	< 0.3	-	Follow-Up Measurement
Cafeteria 42A	9042924	4/30/2018	6:16 PM	5/3/2018	4:56 PM	< 0.3	-	
Cafeteria 42A	9042925	4/30/2018	6:18 PM	5/3/2018	4:56 PM	< 0.3	-	
Classroom 51	9042926	4/30/2018	6:19 PM	5/3/2018	5:02 PM	< 0.3	-	
Classroom 48	9042927	4/30/2018	6:22 PM	5/3/2018	5:08 PM	< 0.3	-	
Classroom 48	9042928	4/30/2018	6:22 PM	5/3/2018	5:07 PM	< 0.3	-	Duplicate RPD = 0%
Classroom 49	9042929	4/30/2018	6:23 PM	5/3/2018	5:07 PM	< 0.3	-	
Classroom 47	9042930	4/30/2018	6:26 PM	5/3/2018	5:08 PM	< 0.3	-	
Classroom 46	9042931	4/30/2018	6:27 PM	5/3/2018	5:07 PM	< 0.3	-	
Lounge Room 44	9042932	4/30/2018	6:29 PM	5/3/2018	5:08 PM	0.5	-	
Boiler Room 45A	9042933	4/30/2018	6:31 PM	5/3/2018	5:03 PM	0.8	-	
Classroom 45	9042934	4/30/2018	6:33 PM	5/3/2018	5:03 PM	< 0.3	-	
Classroom 43	9042935	4/30/2018	6:34 PM	5/3/2018	5:02 PM	< 0.3	-	
Classroom 42	9042936	4/30/2018	6:35 PM	5/3/2018	5:02 PM	< 0.3	-	
Classroom 40	9042937	4/30/2018	6:36 PM	5/3/2018	5:04 PM	< 0.3	-	
Classroom 41	9042938	4/30/2018	6:38 PM	5/3/2018	5:03 PM	< 0.3	-	

**Table 1.0 Radon Measurement Device Results**

**Gates Elementary School  
800 7<sup>th</sup> Avenue  
Aurora, Illinois 60505**

Device Location	Device Serial #	Start Date	Start Time	Stop Date	Stop Time	Result (pCi/L)	Average Result (pCi/L)	Comments
Server Room 32A	9042939	4/30/2018	6:40 PM	5/3/2018	5:14 PM	4.6	5.-3	
Server Room	9106272	11/7/2018	3:13 PM	11/9/2018	4:39 PM	6.6		Follow-Up Measurement
Server Room	9106273	11/7/2018	3:13 PM	11/9/2018	4:39 PM	5.4		Follow-Up Measurement Duplicate RPD = 20%
Classroom 33	9042940	4/30/2018	6:41 PM	5/3/2018	5:15 PM	< 0.3	-	
Classroom 32	9042941	4/30/2018	6:43 PM	5/3/2018	5:15 PM	< 0.3	-	
Classroom 31	9042942	4/30/2018	6:44 PM	5/3/2018	5:13 PM	0.7	-	
Classroom 31	9042943	4/30/2018	6:44 PM	5/3/2018	5:14 PM	0.9	-	Duplicate RPD = 25%
Classroom 30	9042944	4/30/2018	6:45 PM	5/3/2018	5:14 PM	0.6	-	
Stage 31A (Gym)	9042945	4/30/2018	6:48 PM	5/3/2018	5:17 PM	< 0.3	-	
Gymnasium Storage Room	9042946	4/30/2018	6:52 PM	5/3/2018	5:18 PM	< 0.3	-	
Gymnasium 20	9042947	4/30/2018	6:53 PM	5/3/2018	5:18 PM	< 0.3	-	
Gymnasium 20	9042948	4/30/2018	6:53 PM	5/3/2018	---	---	-	Missing at time of retrieval
Gymnasium	9106274	11/7/2018	3:16 PM	11/9/2018	4:37 PM	< 0.3	-	Follow-Up Measurement
Office 20A	9042949	4/30/2018	6:55 PM	5/3/2018	5:28 PM	< 0.3	-	
Classroom 24	9042950	4/30/2018	6:57 PM	5/3/2018	5:29 PM	1.0	-	
Classroom 24A	9042951	4/30/2018	6:59 PM	5/3/2018	5:28 PM	0.7	-	
Classroom 27	9042952	4/30/2018	7:00 PM	5/3/2018	5:29 PM	< 0.3	-	
Classroom 27	9042953	4/30/2018	7:00 PM	5/3/2018	5:29 PM	< 0.3	-	Duplicate RPD = 0%

**Table 1.0 Radon Measurement Device Results**

**Gates Elementary School  
 800 7<sup>th</sup> Avenue  
 Aurora, Illinois 60505**

Device Location	Device Serial #	Start Date	Start Time	Stop Date	Stop Time	Result (pCi/L)	Average Result (pCi/L)	Comments
Classroom 25	9042954	4/30/2018	7:01 PM	5/3/2018	5:27 PM	< 0.3	-	
Classroom 22	9042955	4/30/2018	7:02 PM	5/3/2018	5:28 PM	< 0.3	-	
Classroom 21	9042956	4/30/2018	7:03 PM	5/3/2018	5:27 PM	< 0.3	-	
Classroom 1	9042957	4/30/2018	7:05 PM	5/3/2018	5:35 PM	< 0.3	-	
Classroom 2	9042958	4/30/2018	7:07 PM	5/3/2018	5:35 PM	< 0.3	-	
Classroom 3	9042959	4/30/2018	7:08 PM	5/3/2018	5:36 PM	< 0.3	-	
Classroom 11	9042960	4/30/2018	7:09 PM	5/3/2018	5:36 PM	0.8	-	
Classroom 13	9042961	4/30/2018	7:10 PM	5/3/2018	5:36 PM	1.2	-	
Classroom 15	9042962	4/30/2018	7:11 PM	5/3/2018	5:39 PM	0.8	-	
Classroom 10	9042963	4/30/2018	7:12 PM	5/3/2018	5:41 PM	< 0.3	-	
Classroom 12	9042964	4/30/2018	7:13 PM	5/3/2018	5:42 PM	< 0.3	-	
Classroom 12	9042965	4/30/2018	7:13 PM	5/3/2018	5:40 PM	< 0.3	-	Duplicate RPD = 0%
Classroom 14	9042966	4/30/2018	7:14 PM	5/3/2018	5:41 PM	0.6	-	
Storage 14A	9042967	4/30/2018	7:16 PM	5/3/2018	5:41 PM	< 0.3	-	
Classroom 17	9042968	4/30/2018	7:17 PM	5/3/2018	5:40 PM	< 0.3	-	
Classroom 16	9042969	4/30/2018	7:18 PM	5/3/2018	5:40 PM	< 0.3	-	
Hallway	9042970	4/30/2018	7:19 PM	5/3/2018	5:43 PM	< 0.3	-	Blank
Hallway	9042971	4/30/2018	7:20 PM	5/3/2018	5:43 PM	< 0.3	-	Blank
Hallway	9042972	4/30/2018	7:21 PM	5/3/2018	5:44 PM	< 0.3	-	Blank
Hallway	9042973	4/30/2018	7:22 PM	5/3/2018	5:44 PM	< 0.3	-	Blank

RPD - Relative Percent Difference = difference divided by the average of simultaneous results times 100. Results less than 4.0 pCi/L shall agree with a RPD of less than 67 percent. Results greater than 4.0 pCi/l shall agree with a RDP of less than 36 percent.

The EPA and IEMA recommended radon action level is 4.0 pCi/L.

## 6.0 CONCLUSIONS

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Carnow, Conibear, & Assoc., Ltd. (Carnow Conibear) was contracted by East Aurora School District 131 to perform a radon measurement survey at the Gates Elementary School located at 800 7<sup>th</sup> Avenue in Aurora, Illinois. An initial survey was conducted on April 30, 2018 and completed on May 3, 2018 by Nicole Bennett, an Illinois Emergency Management Agency (IEMA) licensed Radon Measurement Professional (License No. RNI2016213). Following the initial survey, Carnow Conibear conducted a follow-up radon measurement survey in locations exceeding the EPA recommended radon action level of 4.0 PicoCuries per liter (pCi/L). Additional radon samples were collected from locations where device inference prevented the initial sampling from being completed. Subsequently, the follow-up sampling was initiated on November 7, 2018 and completed on November 9, 2018 by Nicole Bennett. The scope of work included short-term (two to four day) radon measurements in frequently occupied rooms with substantial ground contact. The radon sampling was performed following IEMA and the United States Environmental Protection Agency (USEPA) testing protocols for commercial and school radon measurements, the radon device manufacturer's recommendations, and Carnow Conibear's Quality Assurance Plan.

Radon measurement results for initial testing ranged from less than (<) 0.3 to 4.6 pCi/L. Additionally, radon measurement results for follow-up testing ranged from < 0.3 to 6.6 pCi/L. Both initial and follow-up radon measurement results indicated areas tested exceeded the EPA recommended radon action level of 4.0 pCi/L. The average indoor radon concentrations are 1.3 pCi/L nationwide. The average outdoor radon concentration is 0.4 pCi/L.

- Initial and follow-up testing confirmed radon concentrations exceeded the EPA recommended radon action level of 4.0 pCi/L within the Server Room 32A.
- Develop a mitigation strategy to reduce radon concentrations starting with the simplest approach, re-evaluate thru additional radon testing to determine effectiveness, and utilize information to proceed with subsequent phases, as necessary.
- No forced air ventilation is supplied to Server Room 32A. However, a large supply duct is present within the room. Considered installing an air diffuser at the supply duct to allow for the introduction of supply air and increase air movement. Air movement will not only help reduce radon levels but improve overall indoor air quality.
- Ventilation systems present in other areas of the building should be properly maintained, balanced, and operating as designed in an effort to promote healthful indoor air. EPA research findings indicate that schools should identify and correct

ventilation system malfunctions and deficiencies as an initial step in radon reduction.

- Consider contracting an IEMA licensed radon mitigation professional to design and install a remediation system to reduce radon levels within the Server Room. The radon mitigation professional shall be licensed by the IEMA to conduct radon mitigation in schools and commercial buildings. The radon contractor shall install the mitigation system in accordance with all requirements of 32 Illinois Administrative Code 422. The contractor shall verify the location and quantity of suction points and fans installed is adequate to remove the radon gas.
- Conduct post mitigation radon testing to evaluate the radon mitigation system function. The post mitigation testing shall be conducted no sooner than twenty-four (24) hours nor later than thirty (30) days following activation of the mitigation system. The post mitigation radon test shall be conducted by an IEMA licensed radon measurement professional.
- Routine follow-up radon measurement surveys are recommended every two (2) years at different seasonal times following IEMA and the USEPA testing protocols and the radon device manufacturer's recommendations.
- Additional testing is also recommended if significant changes are made to the building's structural or mechanical components.

Because building designs, construction, and tenant and operational use patterns vary, it is not always possible to recommend standard mitigation actions that apply to all buildings. Costs for radon reduction are dependent on the extent and levels of radon, building design and construction, and the ability of maintenance personnel or building engineers to participate in the diagnosis and mitigation of the radon problem.

## **7.0 LIMITATIONS AND CONDITIONS**

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The information contained in this report was prepared for the exclusive use and reliance of East Aurora School District 131 and Carnow Conibear. This information is based on the specific parameters of the scope of work for this project and the regulations in force at the time of the report.

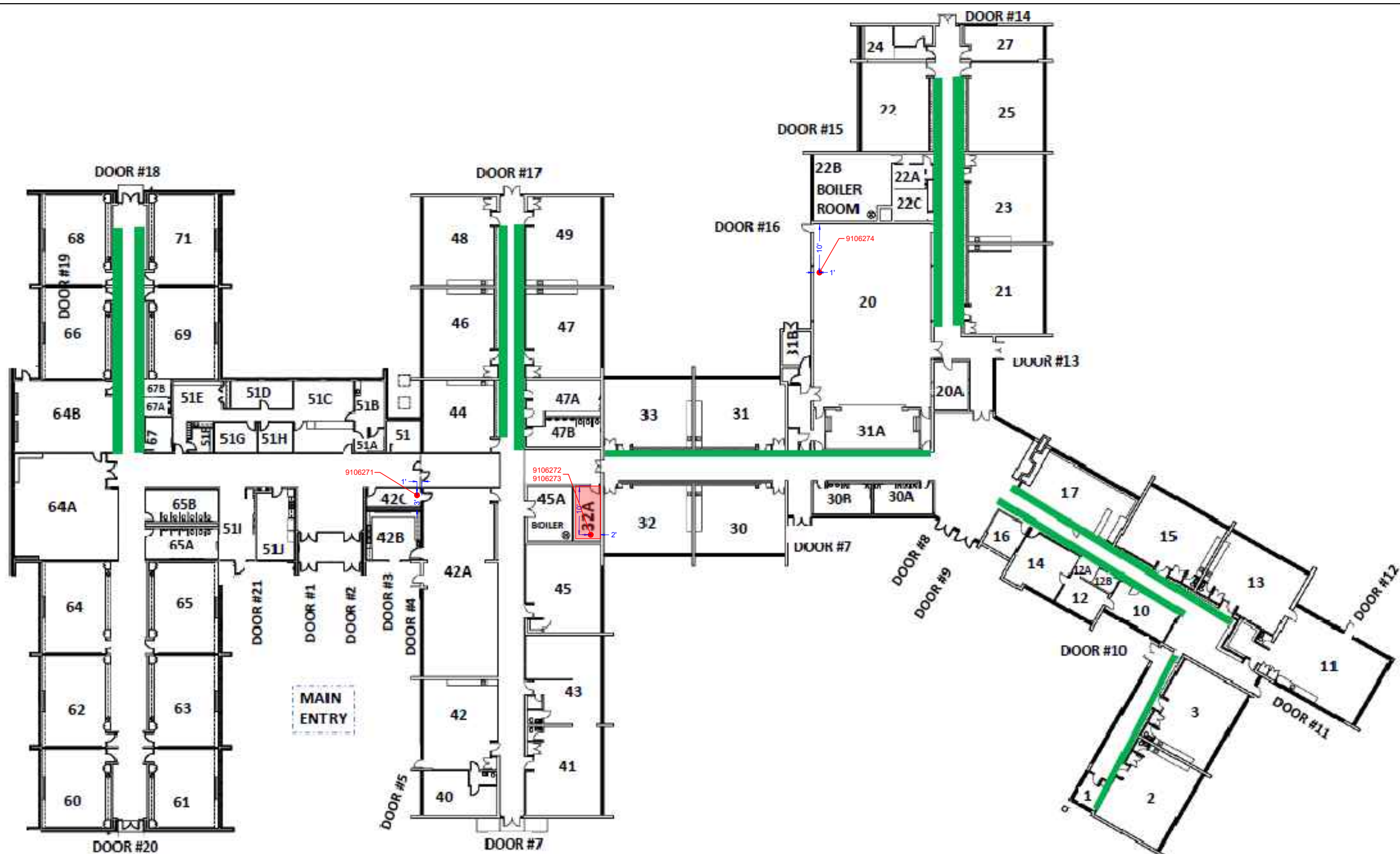
Carnow Conibear has applied prevailing industry standards and reasonable judgment and effort within the scope of work, while conducting the radon measurement survey. The standards, judgment, and effort used by Carnow Conibear personnel to investigate, assess, and determine the presence of potential environmental hazards and liabilities associated with the radon survey at the Gates Elementary School in Aurora, Illinois are consistent with requirements outlined in federal and state guidelines. Carnow Conibear makes no warranty, express or implied, that the findings and interpretations in this report are a complete representation of the environmental hazards and liabilities, associated with the Gates Elementary School, Aurora, Illinois.



## APPENDIX A

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### Floor Plans – Radon Sampling Locations



1 RADON RESAMPLE LOCATIONS  
GROUND FLOOR PLAN

NOT TO SCALE

LEGEND:

- Approximate location of activated charcoal radon measurement device
- 4482418 Radon measurement device serial number
- pCi/L of 4.0 and higher

SHEET TITLE:  
Radon Retesting Locations at  
Gates Elementary School  
800 Seventh Avenue  
Aurora, Illinois 60505

Carnow, Conibear & Assoc., Ltd.  
Environmental Consulting Services  
600 W. Van Buren St., Suite 500, Chicago, IL 60607  
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CCA PROJECT NO. A146000137
SURVEY DATE: 11/7/2018 to 11/9/2018
SHEET NO. <b>Rn-1</b>

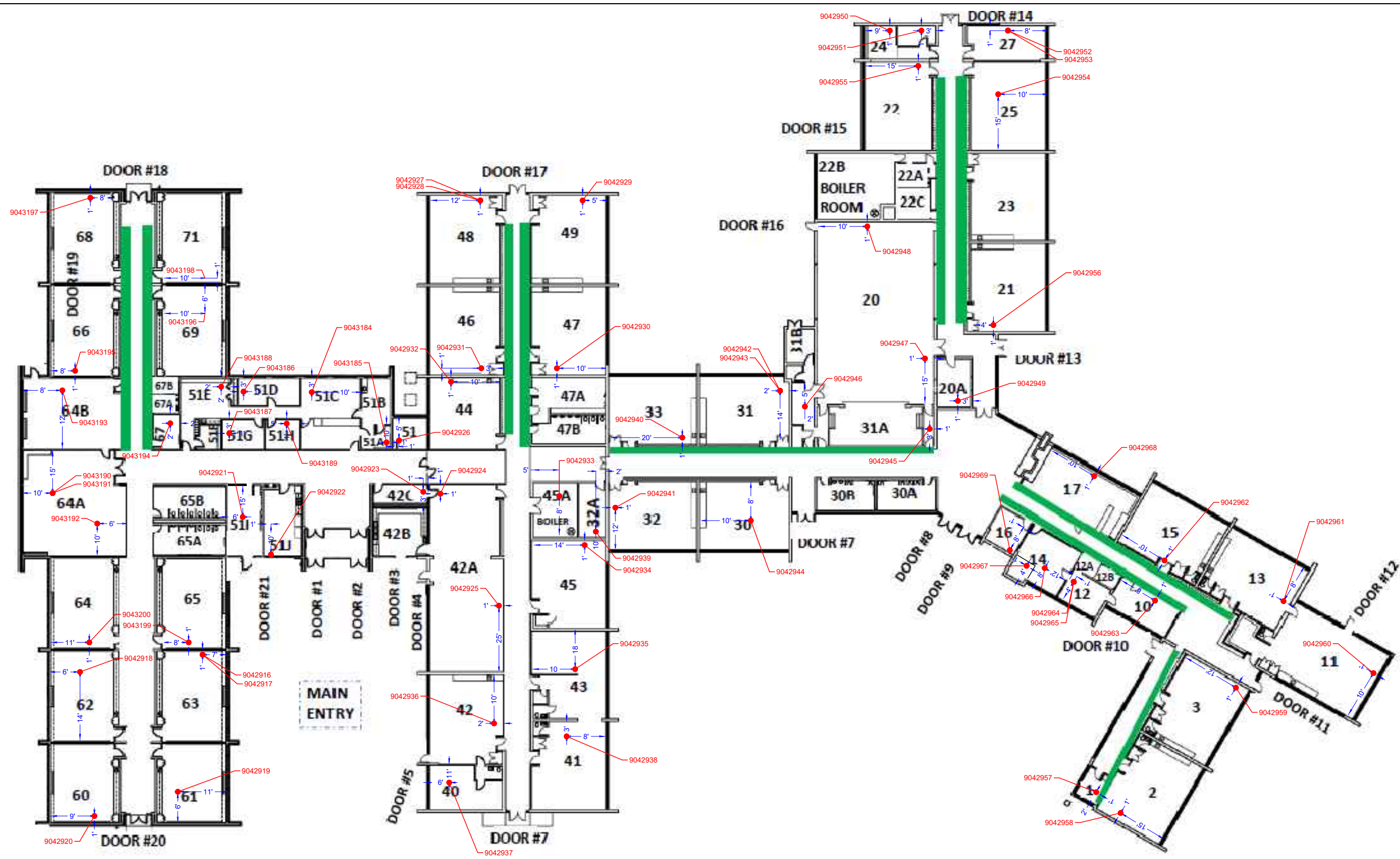
TESTED BY:  
Derek Lantry  
IEMA License #: RNI2004213

DRAWN BY:  
J. Kalingsan

CHECKED BY:  
D. Lantry

CLIENT:  
East Aurora Public School District 131  
417 Fifth Street  
Aurora, Illinois, 60505

\\camow-dc2\01\_compsd\Projects\Radon Program\2018 Projects\2018 East Aurora District Radon Testing\000 Retests (Long and Short-term)\Gates\Gates School Radon Retesting.dwg



1 RADON SAMPLE LOCATIONS  
GROUND FLOOR PLAN

NOT TO SCALE

LEGEND:

- Approximate location of activated charcoal radon measurement device
- 4482418 Radon measurement device serial number

SHEET TITLE:  
Radon Testing Locations at  
Gates Elementary School  
800 Seventh Avenue  
Aurora, Illinois 60505

Carnow, Conibear & Assoc., Ltd.  
Environmental Consulting Services  
600 W. Van Buren St., Suite 500, Chicago, IL 60607  
t: 312.782.4486 f: 312.782.5145  
www.ccaltd.com

CCA PROJECT NO.  
A146000137

SURVEY DATE:  
4/30/2018 to 5/3/2018

SHEET NO.



Rn-1

TESTED BY:  
Derek Lantry  
IEMA License #: RNI2004213

DRAWN BY:  
J. Kalingsan

CHECKED BY:  
D. Lantry

CLIENT:  
East Aurora Public School District 131  
417 Fifth Street  
Aurora, Illinois, 60505

K:\\_comppd\Projects\Radon Program\2018 Projects\2018 East Aurora District Radon Testing\Gates\Gates School Radon.dwg

## APPENDIX B

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### Laboratory Analysis Report

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November 13, 2018

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

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Radon test result report for:

**SCHOOL  
GATES**

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<b>Kit #</b>	<b>Room Id</b>	<b>Started</b>	<b>Ended</b>	<b>pCi/L</b>	<b>Analyzed</b>
9106271	CONCESSION AREA 42C	2018-11-07 @ 3:00 pm	2018-11-09 @ 4:00 pm	< 0.3	2018-11-12
9106274	GYMNASIUM	2018-11-07 @ 3:00 pm	2018-11-09 @ 5:00 pm	< 0.3	2018-11-12
9106272	SERVER ROOM	2018-11-07 @ 3:00 pm	2018-11-09 @ 5:00 pm	6.6 ± 0.6	2018-11-12
9106273	SERVER ROOM	2018-11-07 @ 3:00 pm	2018-11-09 @ 5:00 pm	5.4 ± 0.5	2018-11-12

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

Radon test result report for:

**J.W. GATES ELEMENTARY SCHOOL  
800 SEVENTH AVENUE, AURORA, IL**

Kit #	Room Id	Started	Ended	pCi/L	Analyzed
9042933	BOILER ROOM 45A	2018-04-30 @ 7:00 pm	2018-05-03 @ 5:00 pm	0.8 ± 0.4	2018-05-08
9042925	CAFETERIA 42A	2018-04-30 @ 6:00 pm	2018-05-03 @ 5:00 pm	< 0.3	2018-05-08
9042924	CAFETERIA 42A	2018-04-30 @ 6:00 pm	2018-05-03 @ 5:00 pm	< 0.3	2018-05-08
9042957	CLASSROOM 1	2018-04-30 @ 7:00 pm	2018-05-03 @ 6:00 pm	< 0.3	2018-05-08
9042963	CLASSROOM 10	2018-04-30 @ 7:00 pm	2018-05-03 @ 6:00 pm	< 0.3	2018-05-08
9042960	CLASSROOM 11	2018-04-30 @ 7:00 pm	2018-05-03 @ 6:00 pm	0.8 ± 0.4	2018-05-08
9042964	CLASSROOM 12	2018-04-30 @ 7:00 pm	2018-05-03 @ 6:00 pm	< 0.3	2018-05-08
9042965	CLASSROOM 12	2018-04-30 @ 7:00 pm	2018-05-03 @ 6:00 pm	< 0.3	2018-05-08
9042961	CLASSROOM 13	2018-04-30 @ 7:00 pm	2018-05-03 @ 6:00 pm	1.2 ± 0.4	2018-05-08
9042966	CLASSROOM 14	2018-04-30 @ 7:00 pm	2018-05-03 @ 6:00 pm	0.6 ± 0.4	2018-05-08
9042962	CLASSROOM 15	2018-04-30 @ 7:00 pm	2018-05-03 @ 6:00 pm	0.8 ± 0.4	2018-05-08
9042969	CLASSROOM 16	2018-04-30 @ 7:00 pm	2018-05-03 @ 6:00 pm	< 0.3	2018-05-08
9042968	CLASSROOM 17	2018-04-30 @ 7:00 pm	2018-05-03 @ 6:00 pm	< 0.3	2018-05-08
9042958	CLASSROOM 2	2018-04-30 @ 7:00 pm	2018-05-03 @ 6:00 pm	< 0.3	2018-05-08
9042956	CLASSROOM 21	2018-04-30 @ 7:00 pm	2018-05-03 @ 5:00 pm	< 0.3	2018-05-08
9042955	CLASSROOM 22	2018-04-30 @ 7:00 pm	2018-05-03 @ 5:00 pm	< 0.3	2018-05-08
9042950	CLASSROOM 24	2018-04-30 @ 7:00 pm	2018-05-03 @ 5:00 pm	1.0 ± 0.4	2018-05-08
9042951	CLASSROOM 24A	2018-04-30 @ 7:00 pm	2018-05-03 @ 5:00 pm	0.7 ± 0.4	2018-05-08
9042954	CLASSROOM 25	2018-04-30 @ 7:00 pm	2018-05-03 @ 5:00 pm	< 0.3	2018-05-08
9042952	CLASSROOM 27	2018-04-30 @ 7:00 pm	2018-05-03 @ 5:00 pm	< 0.3	2018-05-08
9042953	CLASSROOM 27	2018-04-30 @ 7:00 pm	2018-05-03 @ 5:00 pm	< 0.3	2018-05-08
9042959	CLASSROOM 3	2018-04-30 @ 7:00 pm	2018-05-03 @ 6:00 pm	< 0.3	2018-05-08
9042944	CLASSROOM 30	2018-04-30 @ 7:00 pm	2018-05-03 @ 5:00 pm	0.6 ± 0.3	2018-05-08
9042942	CLASSROOM 31	2018-04-30 @ 7:00 pm	2018-05-03 @ 5:00 pm	0.7 ± 0.4	2018-05-08
9042943	CLASSROOM 31	2018-04-30 @ 7:00 pm	2018-05-03 @ 5:00 pm	0.9 ± 0.4	2018-05-08
9042941	CLASSROOM 32	2018-04-30 @ 7:00 pm	2018-05-03 @ 5:00 pm	< 0.3	2018-05-08
9042940	CLASSROOM 33	2018-04-30 @ 7:00 pm	2018-05-03 @ 5:00 pm	< 0.3	2018-05-08
9042937	CLASSROOM 40	2018-04-30 @ 7:00 pm	2018-05-03 @ 5:00 pm	< 0.3	2018-05-08
9042938	CLASSROOM 41	2018-04-30 @ 7:00 pm	2018-05-03 @ 5:00 pm	< 0.3	2018-05-08
9042936	CLASSROOM 42	2018-04-30 @ 7:00 pm	2018-05-03 @ 5:00 pm	< 0.3	2018-05-08
9042935	CLASSROOM 43	2018-04-30 @ 7:00 pm	2018-05-03 @ 5:00 pm	< 0.3	2018-05-08
9042934	CLASSROOM 45	2018-04-30 @ 7:00 pm	2018-05-03 @ 5:00 pm	< 0.3	2018-05-08
9042931	CLASSROOM 46	2018-04-30 @ 6:00 pm	2018-05-03 @ 5:00 pm	< 0.3	2018-05-08
9042930	CLASSROOM 47	2018-04-30 @ 6:00 pm	2018-05-03 @ 5:00 pm	< 0.3	2018-05-08
9042928	CLASSROOM 48	2018-04-30 @ 6:00 pm	2018-05-03 @ 5:00 pm	< 0.3	2018-05-08
9042927	CLASSROOM 48	2018-04-30 @ 6:00 pm	2018-05-03 @ 5:00 pm	< 0.3	2018-05-08
9042929	CLASSROOM 49	2018-04-30 @ 6:00 pm	2018-05-03 @ 5:00 pm	< 0.3	2018-05-08



Radon test result report for:**J.W. GATES ELEMENTARY SCHOOL  
800 SEVENTH AVENUE, AURORA, IL**

Kit #	Room Id	Started	Ended	pCi/L	Analyzed
9042926	CLASSROOM 51	2018-04-30 @ 6:00 pm	2018-05-03 @ 5:00 pm	< 0.3	2018-05-08
9042920	CLASSROOM 60	2018-04-30 @ 6:00 pm	2018-05-03 @ 5:00 pm	< 0.3	2018-05-08
9042919	CLASSROOM 61	2018-04-30 @ 6:00 pm	2018-05-03 @ 5:00 pm	0.9 ± 0.4	2018-05-08
9042918	CLASSROOM 62	2018-04-30 @ 6:00 pm	2018-05-03 @ 5:00 pm	< 0.3	2018-05-08
9042917	CLASSROOM 63	2018-04-30 @ 6:00 pm	2018-05-03 @ 5:00 pm	1.0 ± 0.4	2018-05-08
9042916	CLASSROOM 63	2018-04-30 @ 6:00 pm	2018-05-03 @ 5:00 pm	< 0.3	2018-05-08
9043200	CLASSROOM 64	2018-04-30 @ 6:00 pm	2018-05-03 @ 5:00 pm	< 0.3	2018-05-08
9043199	CLASSROOM 65	2018-04-30 @ 6:00 pm	2018-05-03 @ 5:00 pm	< 0.3	2018-05-08
9043195	CLASSROOM 66	2018-04-30 @ 6:00 pm	2018-05-03 @ 5:00 pm	< 0.3	2018-05-08
9043197	CLASSROOM 68	2018-04-30 @ 6:00 pm	2018-05-03 @ 5:00 pm	< 0.3	2018-05-08
9043196	CLASSROOM 69	2018-04-30 @ 6:00 pm	2018-05-03 @ 5:00 pm	< 0.3	2018-05-08
9043198	CLASSROOM 71	2018-04-30 @ 6:00 pm	2018-05-03 @ 5:00 pm	< 0.3	2018-05-08
9043193	COMPUTER LAB 64B	2018-04-30 @ 6:00 pm	2018-05-03 @ 5:00 pm	< 0.3	2018-05-08
9043187	COPY ROOM 51E	2018-04-30 @ 6:00 pm	2018-05-03 @ 5:00 pm	1.2 ± 0.4	2018-05-08
9042947	GYMNASIUM 20	2018-04-30 @ 7:00 pm	2018-05-03 @ 5:00 pm	< 0.3	2018-05-08
9042946	GYMNASIUM STORAGE ROOM	2018-04-30 @ 7:00 pm	2018-05-03 @ 5:00 pm	< 0.3	2018-05-08
9042971	HALLWAY	2018-04-30 @ 7:00 pm	2018-05-03 @ 6:00 pm	< 0.3	2018-05-08
9042972	HALLWAY	2018-04-30 @ 7:00 pm	2018-05-03 @ 6:00 pm	< 0.3	2018-05-08
9042973	HALLWAY	2018-04-30 @ 7:00 pm	2018-05-03 @ 6:00 pm	< 0.3	2018-05-08
9042970	HALLWAY	2018-04-30 @ 7:00 pm	2018-05-03 @ 6:00 pm	< 0.3	2018-05-08
9043190	LIBRARY 64A	2018-04-30 @ 6:00 pm	2018-05-03 @ 5:00 pm	0.8 ± 0.3	2018-05-08
9043191	LIBRARY 64A	2018-04-30 @ 6:00 pm	2018-05-03 @ 5:00 pm	< 0.3	2018-05-08
9043192	LIBRARY 64A	2018-04-30 @ 6:00 pm	2018-05-03 @ 5:00 pm	< 0.3	2018-05-08
9042932	LOUNGE ROOM 44	2018-04-30 @ 6:00 pm	2018-05-03 @ 5:00 pm	0.5 ± 0.3	2018-05-08
9043184	MAIN OFFICE 51C	2018-04-30 @ 6:00 pm	2018-05-03 @ 5:00 pm	< 0.3	2018-05-08
9042921	MECHANICAL ROOM 51I	2018-04-30 @ 6:00 pm	2018-05-03 @ 5:00 pm	< 0.3	2018-05-08
9042922	MUSIC ROOM 51J	2018-04-30 @ 6:00 pm	2018-05-03 @ 5:00 pm	< 0.3	2018-05-08
9043185	NURSES OFFICE 51A	2018-04-30 @ 6:00 pm	2018-05-03 @ 4:00 pm	0.7 ± 0.3	2018-05-08
9042949	OFFICE 20A	2018-04-30 @ 7:00 pm	2018-05-03 @ 5:00 pm	< 0.3	2018-05-08
9043188	OFFICE 51D	2018-04-30 @ 6:00 pm	2018-05-03 @ 5:00 pm	1.6 ± 0.4	2018-05-08
9043186	OFFICE 51G	2018-04-30 @ 6:00 pm	2018-05-03 @ 5:00 pm	< 0.3	2018-05-08
9043189	OFFICE 51H	2018-04-30 @ 6:00 pm	2018-05-03 @ 5:00 pm	0.5 ± 0.4	2018-05-08
9042939	SERVER ROOM 32A	2018-04-30 @ 7:00 pm	2018-05-03 @ 5:00 pm	4.6 ± 0.5	2018-05-08
9042945	STAGE 31A (GYM)	2018-04-30 @ 7:00 pm	2018-05-03 @ 5:00 pm	< 0.3	2018-05-08
9042967	STORAGE 14A	2018-04-30 @ 7:00 pm	2018-05-03 @ 6:00 pm	< 0.3	2018-05-08
9043194	STORAGE ROOM 67	2018-04-30 @ 6:00 pm	2018-05-03 @ 5:00 pm	< 0.3	2018-05-08

## APPENDIX C

### Radon Measurement Professional License

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*Bruce Rauner*  
Governor

State of Illinois  
IEMA Division of Nuclear Safety

*James K. Joseph*  
Director

Pursuant to the Radon Industry Licensing Act, 420 ILCS 44 et seq. and 32 Illinois Administrative Code 422, Licensing of Radon Detection and Mitigation Services, and in reliance on statements and representations heretofore made by the licensee, a license is hereby issued.

This is to certify that **Nicole Bennett**

License Number **RNI2016213**

has met the requirements for **Radon Measurement Professional**

Issued - Expires **05/18/2016 - 05/31/2021**

Limited to **Radon measurements of residential real estate, home environment, school and commercial buildings only.**



161391001

*Patrick I. Daniels*

Patrick I. Daniels, Radon Program