School/Large Building Radon Testing

Lake Mills Community School
102 South 4th Avenue East
Lake Mills, Iowa 50450

Prepared for:

Lake Mills Community School District
102 South 4th Avenue East
Lake Mills, Iowa 50450

Prepared by:

8951 Windsor Parkway
Johnston, Iowa 50131

March 26, 2024

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102 South 4th Avenue East
Lake Mills, Iowa 50450

Inspected/Prepared by:

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Environmental Specialist II
Radon Measurement Specialist: RNTST10189

Reviewed by:

Tyler Silverthorn
Project Manager
Radon Measurement Specialist: RNTST10187

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1.0 EXECUTIVE SUMMARY

Impact7G, Inc. (Impact7G), completed Radon Testing (Testing) on February 21, 2024, with follow-up testing on March 4, 2024, within the school/large building located at 102 South 4th Avenue East, Lake Mills, Iowa 50450 (Property). The purpose of the Testing is to provide a professional opinion of a structure's radon levels. Test results and conditions within the building are limited to the testing period identified in this report. This report is intended to assist Lake Mills Community School District (CSD) (Client) in facilitating radon mitigation activities, if needed.

Radon Testing Results

Average radon concentrations were identified above the US Environmental Protection Agency (EPA) action level of 4.0 pCi/L in three (3) of the eighty-six (86) testing locations within the Property. Radon mitigation activities are recommended to lower the radon concentration in these areas or investigated further with a CRM to determine at what times of day levels are above 4.0 pCi/L. See Table 1 for testing locations.

Average radon concentrations were identified below the EPA action level of 4.0 pCi/L but above 2.0 pCi/L in ten (10) of the eighty-six (86) testing locations within the Property. Radon mitigation activities should be considered at these levels to lower the radon concentration in these areas. It should be noted that the World Health Organization (WHO) recommends limiting long-term exposures to less than 2.7 pCi/L. Retesting is required every 5 years or in conjunction with any sale of the building. See Table 2 for testing locations.

Average radon concentrations were identified below the 2.0 pCi/L in seventy-three (73) of the eight-six (86) testing locations within the Property. Radon mitigation activities are not recommended these levels. Retesting is required every 5 years or in conjunction with any sale of the building. See Table 3 for testing locations.

1.1 Recommendations

Based on the presence of radon concentrations above 4.0 pCi/L, and between 2.0 pCi/L and 4.0 pCi/L, radon mitigation activities are recommended to lower radon concentrations within the building. Impact7G recommends that the locations identified in Table 1 be mitigated in accordance with applicable Federal, State and Local Regulations or investigated further with a CRM to determine at what times of day levels are above 4.0 pCi/L. Impact7G recommends mitigation be considered in the locations identified in Table 2. If mitigation will be conducted, it is required to be conducted by an Iowa Certified Mitigation Specialist. A complete list of analytical laboratory results are provided in Appendix B.

This report is designed to aid the building owner, architect, construction manager, general contractor, and/or mitigation specialist in locating areas with elevated concentrations of radon. This report is not to be used as a mitigation specification, as it does not contain needed components to serve as such.

2.0 INTRODUCTION

A. Property Information

Location:

Lake Mills Community School
102 South 4th Avenue East
Lake Mills, Iowa 50450

Contact Person:

Mr. Mike Nelson
Lake Mills Community School District
102 South 4th Avenue East
Lake Mills, Iowa 50450

B. Personnel

QC/QA: Tyler Silverthorn	Radon Measurement Specialist	RNTST10189
Inspector: Leon Johnson	Radon Measurement Specialist	RNTST10187

C. Sampling Plan

The extended testing protocol was used for the Testing. One, short-term, Pro Chek, charcoal device was placed at each testing location in all occupied ground contact rooms and at least one, and not less than 10%, occupied upper floor rooms. Devices were set for a minimum of 48 hours after closed building conditions were achieved.

At least one, but not less than 10%, duplicate samples were collected.

At least one, but not less than 5%, blank samples were collected.

At least one, but not less than 3%, spike samples were collected. Devices intended to be used as spike samples were submitted to Bowser-Morner to be spiked in their Radon Chamber.

Analytical results for blank and spike samples are located in complete analytical results found in Appendix B.

All devices were submitted and analyzed by Air Chek, an Iowa Certified Radon Laboratory (RNLAB10012).

D. Regulation Review

The testing was conducted in accordance with EPA, American National Standards Institute (ANSI), American Association of Radon Scientists and Technologists (AARSTF), and Iowa Administrative Code (IAC) 641, Chapter 43.

A mitigation decision to fix the building is recommended when the average radon concentration within a room is greater than or equal to 4.0 pCi/L. Mitigation should be considered when the average radon concentration within a room is greater than equal to 2.0 pCi/L and less than 4.0 pCi/L.

3.0 PROPERTY DESCRIPTION

The Property consists of a three-story school/large building constructed in 1920 with additions in 1940, 1970, 1980, 1990, and 2000. The existing school/large building is located at 102

South 4th Avenue East, Lake Mills, Iowa 50450. Required closed building test conditions were observed at deployment and retrieval.

4.0 INSPECTION LIMITATIONS

Radon testing results identified in this report are limited to the time of the test conducted, for the test period that was conducted, and to the conditions that were present at the time the samples were collected, as indicated in this report.

This tested structure should be retested in the following cases:

1. If the structure was unoccupied during the test, the structure should be retested after occupancy;
2. If the structure is located in an area of karst or glacial moraine geology, it should be retested over a 12-month period;
3. If occupied by a new owner;
4. If the initial test was less than 4 pCi/L, retest every very five years after initial testing;
5. If a new addition is added;
6. If an alteration is made that could change the structure's ventilation patterns;
7. If major cracks or penetrations occur in the structure's foundation walls or slab;
8. If significant nearby construction blasting or earthquakes occur;
9. If changes are made or happen to an installed mitigation system; or
10. If a ground-contacted area is occupied that was not previously tested.

5.0 INSPECTION ACTIVITIES

5.1 Radon Testing

An Iowa certified Radon Measurement Specialist from Impact7G collected eighty-six (86) samples (plus two (two) follow up samples, fourteen (14) duplicates, five (5) blanks samples, and (3) three spike samples) on February 21, 2024 and March 4, 2024. The samples were collected from various areas located throughout the Property. The tables below identify the areas that were tested and the associated average results in pCi/L. A complete list of analytical laboratory results are provided in Appendix B.

Table 1 – Radon Testing Results 4.0 pCi/L or Greater

Kit Numbers	Room	Average Result (pCi/L)	Mitigation Decision
11483402 11485481 11485482	Boiler Room	9.3	Fix/Further Investigation
11485485 11485486 11485436	54	4.7	Fix/Further Investigation
11483408 11483409	51	7.4	Fix/Further Investigation

Average radon concentrations were identified above the US Environmental Protection Agency (EPA) action level of 4.0 pCi/L in three (3) of the eighty-six (86) testing locations within the Property. Radon mitigation activities are recommended to lower the radon concentration in these areas or investigated further with a CRM to determine at what times of day levels are above 4.0 pCi/L

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Table 2 – Radon Testing Results Between 2.0 pCi/L and 4.0 pCi/L

Kit Numbers	Room	Average Result (pCi/L)	Mitigation Decision
11483401	304	3.3	Consider Fixing
11483407	50	2.1	Consider Fixing
11485433	52	2.3	Consider Fixing
11485434 11485435	53	3.0	Consider Fixing
11485437	47	2.0	Consider Fixing
11485438	48	3.5	Consider Fixing
11485439	49	2.1	Consider Fixing
11485453	Wrestling Room	3.2	Consider Fixing
11485470	125	2.4	Consider Fixing
11485471	Secretary	2.5	Consider Fixing

Average radon concentrations were identified below the EPA action level of 4.0 pCi/L but above 2.0 pCi/L in ten (10) of the eighty-six (86) testing locations within the Property. Radon mitigation activities should be considered at these levels to lower the radon concentration in these areas. It should be noted that the World Health Organization (WHO) recommends limiting long-term exposures to less than 2.7 pCi/L. If mitigation is not completed in these areas, retesting is required every 5 years or in conjunction with any sale of the building.

Table 3 – Radon Testing Results Below 2.0 pCi/L

Kit Numbers	Room	Average Result (pCi/L)	Mitigation Decision
11483399	208	0.6	Retest in 5 Years
11483400	212	0.9	Retest in 5 Years
11483403	H6 Locker Room	1.0	Retest in 5 Years
11483404	98	<0.3	Retest in 5 Years
11483405	1	<0.3	Retest in 5 Years
11483406	2	0.6	Retest in 5 Years
11483410	3	<0.3	Retest in 5 Years
11483411	4	<0.3	Retest in 5 Years
11483412	5	0.5	Retest in 5 Years
11483413	6	<0.3	Retest in 5 Years
11483414	7A	0.8	Retest in 5 Years
11483415	7B	0.7	Retest in 5 Years
11483416	8	<0.3	Retest in 5 Years
11485401	21	<0.3	Retest in 5 Years
11485402	22	0.6	Retest in 5 Years
11485403 11485404	26	1.0	Retest in 5 Years
11485405	27	0.8	Retest in 5 Years
11485406	28	0.7	Retest in 5 Years
11485407	29	0.8	Retest in 5 Years
11485408	30 West	0.6	Retest in 5 Years
11485409	31	0.6	Retest in 5 Years
11485410	32	0.8	Retest in 5 Years
11485411	122	0.8	Retest in 5 Years
11485412 11485413	123	1.6	Retest in 5 Years
11485414	124	1.6	Retest in 5 Years

Kit Numbers	Room	Average Result (pCi/L)	Mitigation Decision
11485415	HS Principal	1.6	Retest in 5 Years
11485416	126	1.6	Retest in 5 Years
11485417	AD	1.2	Retest in 5 Years
11485418	30 East	1.7	Retest in 5 Years
11485419 11485420	40A	1.1	Retest in 5 Years
11485421	111	<0.3	Retest in 5 Years
11485422	116	0.9	Retest in 5 Years
11485423 11485424	115	0.6	Retest in 5 Years
11485425 11485426	104	0.3	Retest in 5 Years
11485427	102	<0.3	Retest in 5 Years
11485428	101	<0.3	Retest in 5 Years
11485429	114	0.6	Retest in 5 Years
11485430	109	1.8	Retest in 5 Years
11485431 11485432	106	1.2	Retest in 5 Years
11485440 11485441	15	0.3	Retest in 5 Years
11485442	16	0.6	Retest in 5 Years
11485443	17	0.7	Retest in 5 Years
11485444 11485445	18	0.3	Retest in 5 Years
11485446	19	<0.3	Retest in 5 Years
11485447	20	0.7	Retest in 5 Years
11485448	21A	1.3	Retest in 5 Years
11485449	106B	1.2	Retest in 5 Years
11485450	Elementary Gym	1.5	Retest in 5 Years
11485451	PE Office	1.2	Retest in 5 Years
11485452	46	1.5	Retest in 5 Years
11485454	103	0.6	Retest in 5 Years
11485455	105	<0.3	Retest in 5 Years
11485456	36A West	<0.3	Retest in 5 Years
11485457	36A East	<0.3	Retest in 5 Years
11485458	36B	<0.3	Retest in 5 Years
11485459	37	<0.3	Retest in 5 Years
11485460	38	0.5	Retest in 5 Years
11485461	39	<0.3	Retest in 5 Years
11485462	41	<0.3	Retest in 5 Years
11485463	34	0.7	Retest in 5 Years
11485464	35	0.5	Retest in 5 Years
11485465	9	0.8	Retest in 5 Years
11485466	7	<0.3	Retest in 5 Years
11485467	97	<0.3	Retest in 5 Years
11485468	121	1.5	Retest in 5 Years
11485472	132N	1.6	Retest in 5 Years
11485473	132S	1.6	Retest in 5 Years
11485474	40B	1.0	Retest in 5 Years
11485475 11485476	Records	1.0	Retest in 5 Years

Kit Numbers	Room	Average Result (pCi/L)	Mitigation Decision
11485477 11485479	112	0.3	Retest in 5 Years
11485478	Greenhouse	0.5	Retest in 5 Years
11485480	113	0.8	Retest in 5 Years
11485483 11485484	120	1.2	Retest in 5 Years

Average radon concentrations were identified below the 2.0 pCi/L in seventy-three (73) of the eighty-six (86) testing locations within the Property. Radon mitigation activities are not recommended these levels and retesting is required every 5 years or in conjunction with any sale of the building.

5.2 Quality Control

Quality Control samples were collected and then submitted and analyzed by the AirChek laboratory. Quality control samples were made up of duplicates, blanks, and spikes. 100% duplicates were collected due to the time-sensitive testing protocol. One field blank was collected and submitted to the lab. Three spike samples were sent to the Bowser-Morner Radon Chamber and subsequently submitted to the laboratory for analysis. All quality control samples were within acceptable limits and are included in the complete analytical results in Appendix B.

Radon is the second leading cause of lung cancer, after smoking. The U.S. Environmental Protection Agency (EPA) and the Surgeon General strongly recommend taking further action when the home's radon test results are 4.0 pCi/l (picocuries per liter of air) or greater. Radon levels less than 4.0 pCi/l still pose some risk and, in many cases, may be reduced. The annual national average indoor radon level is about 1.3 pCi/l while annual outdoor radon levels average 0.4 pCi/l. The higher a home's radon level, the greater the health risk to you and your family. Smokers, former smokers, and individuals with a family history of lung cancer are at especially high risk. An Iowa credentialed mitigation specialist should be used to fix radon problems. Contact the Iowa Department of Public Health Radom Program at (515) 281-4928 or at **www.idph.iowa.gov/radon/fix** to obtain information, including a list of State-credentialed radon mitigation specialists who can fix or can help you develop a plan for fixing the radon problem.

There can be uncertainty with any radon measurement due to statistical variations and other factors such as daily and seasonal variations in radon concentrations due to changes in the weather and operation of the dwelling as well as possible interference with the necessary test conditions that may or may not influence the results.

5.3 Testing Conditions

Table 4, located below, identifies indoor/outdoor conditions during the testing as compared to the annual averages for the area. Fluctuations in local weather during the testing may impact indoor radon concentrations.

Table 4a – Testing Conditions (02/21/2024)

Outdoor Temperatures	Averages	Annual		During the Test
		54°		39°
Operating Conditions	Heating Conditions	66%	Compared To	100%
	Cooling Conditions	16%		0%
	Mixed Conditions	16%		0%
Prevailing Operating Conditions	Averages	Heating Conditions	Compared To	Heating Conditions
Condition Less Likely to Inhibit Characterization of a Radon Hazard		Air Distribution Systems Active		Air Distribution Systems Active
			Indoor Temperature	70°

Table 4b – Testing Conditions (03/04/2024)

Outdoor Temperatures	Averages	Annual		During the Test
		54°		33°
Operating Conditions	Heating Conditions	66%	Compared To	100%
	Cooling Conditions	16%		0%
	Mixed Conditions	16%		0%
Prevailing Operating Conditions	Averages	Heating Conditions		Heating Conditions
Condition Less Likely to Inhibit Characterization of a Radon Hazard		Air Distribution Systems Active		Air Distribution Systems Active
			Indoor Temperature	70°

6.0 CONCLUSIONS / RECOMMENDATIONS

The following conclusions and recommendations are summarized as follows:

- Based on the presence of radon concentrations above 4.0 pCi/L in three locations, and between 2.0 pCi/L and 4.0 pCi/L in ten location, radon mitigation activities are recommended to lower radon concentrations within the building. Impact7G recommends that the locations identified in Table 1 be mitigated in accordance with applicable Federal, State and Local Regulations or investigated further with a CRM to determine at what times of day levels are above 4.0 pCi/L. Impact7G recommends mitigation be considered in the locations identified in Table 2. Mitigation is required to be conducted by an Iowa Certified Mitigation Specialist.

This report is designed to aid the building owner, architect, construction manager, general contractor, and/or mitigation specialist in locating areas with elevated concentrations of radon. This report is not to be used as a mitigation specification, as it does not contain needed components to serve as such.

7.0 CONDITIONS & LIMITATIONS

Impact7G has performed the tasks contained within this report in a thorough and professional manner consistent with commonly accepted standard industry practices. The results, findings,

conclusions and recommendations expressed in this report are based on conditions observed during our survey of the Property. Impact7G cannot guarantee, and does not warrant, that this report has identified all adverse environmental factors and/or conditions affecting the Property on the date of the inspection. Impact7G cannot and will not warrant that the Inspection that was requested will satisfy the dictates of, or provide, a legal defense in connection with any environmental laws or regulations. It is the responsibility of the client to know and abide by all applicable laws, regulations, and standards. This report is not a bidding document or project specification as it does not contain the necessary components. This report has been prepared on behalf of and exclusively for use of Lake Mills CSD., for specific application to their project as discussed. Contractors, consultants or other third parties reviewing this report must draw their own conclusions regarding data contained within the report, further investigation or required mitigation.

Impact7G, Inc. (Impact7G) cannot guarantee the necessary conditions were maintained during the test period. There can be uncertainty with any radon measurement due to statistical variations and other factors such as changes in the weather and operation of the dwelling. While our radon measurement technicians and we make every effort to maintain the highest possible quality control and include checks and verification steps in our procedures, we make NO WARRANTY OF ANY KIND, EXPRESSED OR IMPLIED, for the consequences of erroneous test results. Impact7G nor its employees or agents shall not be liable under any claim, charge or demand, whether in contract, tort, or otherwise, for any and all loss, cost, charge, claim, demand, fee, or expense of any nature or kind arising out of, connected with, resulting from, or sustained as a result of any radon test.

It is a violation of law for anyone other than the certified Radon Measurement Specialist signing it to alter this report. This report may be supplemented with additional information, so long as any addendum is signed by a Radon Measurement Specialist certified according to Iowa Administrative Code 641, Chapter 43.