

February 11, 2022

Mr. Chris Fenske
Superintendent
Lakeview Public Schools
875 Barstad Road North
Cottonwood, MN 56229



**RE: K-12 Building
Short-Term Radon Testing Results
IEA Project #202111102**

Dear Mr. Fenske:

IEA placed 140 Air Chek Pro Chek short-term radon test kits in the K-12 district building for the purpose of evaluating radon levels.

The radon samples were placed and retrieved by the following Minnesota Department of Health (MDH) licensed Radon Measurement Professional:

Measurement Professional	License Number	Signature
Aaron Hess	RMEA-00045	

Conditions of air intakes were good and the ventilation system was operating in good condition at the time of placement and retrieval.

INTRODUCTION

Radon is a colorless, odorless, tasteless, radioactive gas that occurs naturally in soil, rocks, and underground water supplies and in the ambient air. According to the U.S. Environmental Protection Agency (EPA) and other scientific organizations, naturally occurring radon gas has been associated with an increased risk of developing lung cancer. The chances of developing lung cancer from radon exposure are dependent on several factors, including individual susceptibility and, perhaps more importantly, the dose and duration of exposure. Radon testing in schools is highly recommended by the Minnesota Department of Health (MDH) and EPA.

IEA placed 140 Air Chek Pro Chek short-term radon test kits in frequently occupied areas in the K-12 district building for the purpose of sampling for radon in accordance with the MDH's *Guidance for Radon Testing in Minnesota Schools (2021)* and ANSI/AARST 'Protocol for Conducting Measurements of Radon and Radon Decay Products in Schools and Large Buildings' (ANSI/AARST MALB 2014 with 1/21 revisions).

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BRAINERD
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Brainerd, MN 56401
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800-233-9513

MARSHALL
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Marshall, MN 56258
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800-233-9513

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5525 Emerald Avenue
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A total of 140 radon test kits were placed from January 24, 2022, to January 27, 2022, for a total short-term sampling period of three (3) days. The radon test kits were analyzed by AirChek, Inc., MDH license #RL-00003, located at 1936 Butler Bridge Road, Mills River, NC 28759. The sampling and analysis methodologies are provided in Appendix A.

IEA followed ANSI/AARST MALB 2014 with 1/21 revisions for quality assurance measurements by including duplicate kits, control kits (blanks), and spiked kits.

Client communications and commitments were delivered to the client on the following dates:

- January 8, 2021 – Client advisories and authorizations
- January 11, and 19, 2022 – Client and facilitating staff commitments
- January 24, 2022 – Occupant notices

EVALUATION CRITERIA

The MDH and the EPA have established a recommended action level in intended to be occupied areas of 4.0 picocuries per liter (pCi/L) for an annual average. Testing was conducted during school days when the building is significantly occupied. The HVAC system was set as it normally is during school days. Testing was conducted during the heating season when the average outdoor temperature is less than 65°F, as recommended by the MDH, when the ventilation system was operating normally, and windows and doors were closed. Consequently, sampling under these “closed” conditions is when the radon risk is most likely to occur.

MDH recommends follow-up testing for sampling results that are above the action level. Please refer to the following table for MDH guidelines:

RESULTS (pCi/L)	RECOMMENDED ACTION
LESS THAN 4	Re-test after changes to foundation or HVAC and every 5 years
GREATER THAN 4	Conduct CRM short-term testing during winter months
LESS THAN 4 (<u>DURING OCCUPANCY</u>) AFTER CRM TESTING	Repeat CRM testing if not conducted during winter or if conducted during abnormal ventilation. Otherwise consider re-testing after changes to foundation or HVAC and every 5 years
GREATER THAN 4 (<u>DURING OCCUPANCY</u>) AFTER CRM TESTING	Reduce radon in rooms to less than 4 through radon mitigation. Conduct CRM testing to verify radon reduction.

CRM: Continuous Radon Monitor

RESULTS & DISCUSSION

The laboratory report, which includes maps of the K-12 building with sampling locations marked, is provided in Appendix B. Following are summary results for that building.

K-12 Building

875 Barstad Road North
Cottonwood, MN 56229

A total of 140 test kits were placed at the K-12 building. The results indicated that radon levels were below the action level of 4 pCi/L. See Table 1 for a summary of the results:

TABLE 1: K-12 Building RANGE OF RESULTS				
	0.0 – 1.9 pCi/L	2.0 – 2.9 pCi/L	3.0 – 3.9 pCi/L	≥ 4 pCi/L
Number of Tests	140	0	0	0
All below action level				

pCi/L: picocuries per liter

CONCLUSIONS & RECOMMENDATIONS

The radon levels in the sampled locations were below the EPA action level of 4 pCi/L.

The EPA has established recommended guidelines for permissible radon concentrations in schools. The following are general recommendations for frequently occupied areas of schools:

- The building should be retested at least every 5 years and in conjunction with any sale of the building.
- Rooms that were not tested because they were not occupied, should be tested if they become occupied in the future.

In addition, retesting should be conducted when any of the following circumstances occur:

- A new addition is constructed, or a significant renovation occurs
- A ground contact area not previously tested is occupied
- Heating or cooling systems are significantly altered, resulting in changes to air pressures or distribution
- Ventilation is significantly altered by extensive weatherization, changes to mechanical systems, or comparable procedures
- Significant openings to soil occur due to:
 - Ground water or slab surface water control systems (e.g., sumps, perimeter drain tile, shower/tub retrofits, etc.)
 - Natural settlement causing major cracks to develop
 - Earthquakes, construction blasting, or formation of sink holes nearby
 - A mitigation system is altered, modified or repaired
- Rooms should be retested during the winter heating season (i.e., under “closed” conditions) which is typically “worst case” conditions.

Per Minnesota Statutes, section 123B.571, school districts are required to report radon test results at a school board meeting and report results to the MDH. IEA is able to assist with presenting results to the school board, and the MDH reporting. The MDH ‘School Radon Testing Form’ is located in Appendix E.

For more information regarding radon, see the EPA's A Citizen's Guide to Radon at <http://www.epa.gov/radon>. MDH can be contacted at health.indoorair@state.mn.us or 651-201-4601.

GENERAL COMMENTS

The analysis and opinions expressed in this report are based upon data obtained from radon sampling in representative district locations and time period sampled. This report does not reflect variations in conditions that may occur across the site, property, or facility. Actual conditions may vary and may not become evident without further assessment.

The report is prepared for the exclusive use of our client for specific application to the project discussed and has been prepared in accordance with generally accepted environmental, health and safety practices. Other than as provided in the preceding sentence and in our Proposal #9397 dated January 8, 2021, regarding radon sampling services at the district locations, including the General Conditions attached thereto, no warranties are extended or made.

IEA appreciates the opportunity to submit this analysis to the district.

Should you require additional radon testing or have any questions regarding radon or any other environmental, health, or safety-related concerns, please do not hesitate to contact our office.

Sincerely,

IEA, Inc.



Aaron Hess
EHS Account Manager

KW/khb 02112022

Enc.

Appendix A

Methodology and Quality Control Measurements

Sampling Methodology

IEA placed Air Chek, Inc. Pro Chek activated charcoal radon test kits designed specifically for the detection of gamma emissions caused by the decay of Radon-222 and its daughter products. The kit is made of a padded envelope which contains activated charcoal. The kit is placed during normal occupancy HVAC operations and sealed with vinyl tape after 72 to 96 hours of indoor exposure. Individual kits are uniquely identified with a number and corresponding bar code.

Upon receipt at the analytical laboratory, the kits are logged in using the unique numbers assigned to each kit. The kits are placed on a gamma detector to count the gamma emissions from the decay of radon adsorbed by the charcoal. A calibration factor determined in part by the exposure time and decay time is used to calculate the radon concentration. A correction factor is also applied for weight gain from any moisture absorbed by the charcoal during the sampling period.

Any unusual conditions are noted on the processing form and shown on the exposure report.

MDH and ANSI/AARST MALB 2014 Quality Control Measurements

IEA followed ANSI/AARST MALB 2014 with 1/21 revisions and MDH recommendations for quality assurance measurements to ensure the accuracy of test results. Quality assurance measurements include side-by-side test kits (duplicates) and unexposed control test kits (blanks).

Duplicates are pairs of test kits placed 4-8 inches apart for the same test period. Duplicates are stored, placed, retrieved, and shipped to the laboratory for analysis in the same manner as the other test kits so that the laboratory cannot distinguish them. Since duplicates are placed side-by-side, the measured values for radon should be the same. The average of all duplicates' relative percent difference (RPD) should not exceed 25%. If they do, an investigation to identify the cause may be warranted and could include repeating the measurements. Duplicate averages are listed in Table 1.

Location	Test 1 (pCi/L)	Test 2 (pCi/L)	Average (pCi/L)
117	< 0.3	< 0.3	< 0.3
121	0.9	< 0.3	0.6
129	< 0.3	< 0.3	< 0.3
153	0.6	0.8	0.7
258	0.6	< 0.3	0.4
307	0.7	< 0.3	0.5
320	< 0.3	< 0.3	< 0.3
411	< 0.3	< 0.3	< 0.3
416	< 0.3	< 0.3	< 0.3
419B	< 0.3	< 0.3	< 0.3
451	0.6	< 0.3	0.4
High School Office	< 0.3	0.6	0.4
Kitchen Office	1.0	< 0.3	0.6

Blanks can be used to determine whether the manufacturing, shipping, storage, or processing of the detector has "contaminated" your measurements. Blanks are opened and immediately re-sealed to keep room air from infiltrating the test kit. Blanks are labeled and shipped in the same manner as the exposed test kits so that the laboratory cannot distinguish them. Since blanks are not exposed to radon, their measurement value should be below the lower limit of detection. Field blanks, Office blanks, and Lab-Transit Blanks are listed in Table 2.

Date	Device ID	Type of Blank	Description	Radon Concentration
1/31/2022	11017898	Field	FStorage Room A	< 0.3
1/31/2022	9555701	Field	FStorage Room B	< 0.3
1/31/2022	9568508	Field	FStorage Room C	< 0.3
1/31/2022	9568509	Office	OStorage Room A	< 0.3
1/31/2022	9568510	Office	OStorage Room B	< 0.3
1/31/2022	9573608	Office	OStorage Room C	< 0.3
1/20/2022	11021517	Lab-Transit	LTStorage Room A	< 0.3
1/20/2022	11021518	Lab-Transit	LTStorage Room B	< 0.3
1/20/2022	11021519	Lab-Transit	LTStorage Room C	< 0.3

Spikes are test kits that have been exposed in a chamber to a known concentration of radon. Using spiked measurements can help evaluate the accuracy of a laboratory analysis and/or how accurately test kits supplied by a laboratory measure radon. Spiked test kits are labeled and shipped in the same manner as the exposed test kits so that the laboratory cannot distinguish them. Spiked results completed for our laboratory are included in the following pages. Spiked test kits are listed in Table 3.

Table 3: Spiked Detectors			
Date	Device ID	Measured Value (pCi/L)	Reference Value (pCi/L)
11/11/2021	11019101	30.4	36.0
11/11/2021	11019102	32.6	36.0
11/11/2021	11019103	32.8	36.0
11/11/2021	11019104	31.2	36.0
11/11/2021	11019105	32.0	36.0
11/11/2021	11019106	31.2	36.0
12/28/2021	11021538	27.1	32.3
12/28/2021	11021537	28.9	32.3
12/28/2021	11021509	28.8	32.3
12/28/2021	11021514	27.1	32.3
12/28/2021	11021516	25.1	32.3
12/28/2021	11021520	28.1	32.3
1/27/2022	11019414	27.1	30.3
1/27/2022	11019415	28.2	30.3
1/27/2022	11019416	28.6	30.3
1/27/2022	11019417	27.1	30.3
1/27/2022	11019418	26.9	30.3
1/27/2022	11019419	29.0	30.3

Appendix B

Laboratory Report and Maps

Radon test result report for:

LAKEVIEW HIGH SCHOOL**K-12**

Kit #	Room Id	Started	Ended	pCi/L	Analyzed
11019466	100	2022-01-24 @ 7:00 am	2022-01-27 @ 10:00 am	0.6 ± 0.4	2022-01-31
11018115	101	2022-01-24 @ 7:00 am	2022-01-27 @ 10:00 am	< 0.3	2022-01-31
11019216	102	2022-01-24 @ 7:00 am	2022-01-27 @ 10:00 am	< 0.3	2022-01-31
11018118	103	2022-01-24 @ 7:00 am	2022-01-27 @ 10:00 am	< 0.3	2022-01-31
11019487	104	2022-01-24 @ 7:00 am	2022-01-27 @ 10:00 am	< 0.3	2022-01-31
11018109	105	2022-01-24 @ 7:00 am	2022-01-27 @ 10:00 am	< 0.3	2022-01-31
11018295	106	2022-01-24 @ 7:00 am	2022-01-27 @ 11:00 am	0.6 ± 0.4	2022-01-31
11018108	108	2022-01-24 @ 7:00 am	2022-01-27 @ 10:00 am	1.0 ± 0.4	2022-01-31
11018106	109	2022-01-24 @ 7:00 am	2022-01-27 @ 10:00 am	0.6 ± 0.3	2022-01-31
11018120	116	2022-01-24 @ 7:00 am	2022-01-27 @ 10:00 am	0.6 ± 0.3	2022-01-31
11019486	117	2022-01-24 @ 7:00 am	2022-01-27 @ 10:00 am	< 0.3	2022-01-31
11019488	118	2022-01-24 @ 7:00 am	2022-01-27 @ 10:00 am	< 0.3	2022-01-31
11019485	119	2022-01-24 @ 7:00 am	2022-01-27 @ 10:00 am	0.7 ± 0.3	2022-01-31
11019206	120	2022-01-24 @ 6:00 am	2022-01-27 @ 10:00 am	< 0.3	2022-01-31
11019890	121	2022-01-24 @ 6:00 am	2022-01-27 @ 10:00 am	0.9 ± 0.3	2022-01-31
11019888	124	2022-01-24 @ 6:00 am	2022-01-27 @ 10:00 am	0.6 ± 0.3	2022-01-31
11019217	125	2022-01-24 @ 6:00 am	2022-01-27 @ 10:00 am	0.8 ± 0.3	2022-01-31
11017895	126	2022-01-24 @ 7:00 am	2022-01-27 @ 9:00 am	0.6 ± 0.4	2022-01-31
11018117	127	2022-01-24 @ 7:00 am	2022-01-27 @ 9:00 am	< 0.3	2022-01-31
11017899	128	2022-01-24 @ 7:00 am	2022-01-27 @ 9:00 am	0.5 ± 0.3	2022-01-31
11020028	129	2022-01-24 @ 7:00 am	2022-01-27 @ 9:00 am	< 0.3	2022-01-31
11018296	130	2022-01-24 @ 7:00 am	2022-01-27 @ 9:00 am	0.7 ± 0.3	2022-01-31
11018298	131	2022-01-24 @ 7:00 am	2022-01-27 @ 9:00 am	< 0.3	2022-01-31
11018292	132	2022-01-24 @ 7:00 am	2022-01-27 @ 9:00 am	0.5 ± 0.3	2022-01-31
11017890	141	2022-01-24 @ 7:00 am	2022-01-27 @ 9:00 am	0.9 ± 0.4	2022-01-31
11019891	148	2022-01-24 @ 7:00 am	2022-01-27 @ 10:00 am	0.5 ± 0.3	2022-01-31
11019463	149	2022-01-24 @ 7:00 am	2022-01-27 @ 10:00 am	1.0 ± 0.4	2022-01-31
11018122	151	2022-01-24 @ 7:00 am	2022-01-27 @ 10:00 am	0.5 ± 0.4	2022-01-31
11018121	152	2022-01-24 @ 7:00 am	2022-01-27 @ 10:00 am	0.5 ± 0.3	2022-01-31
11018105	153	2022-01-24 @ 7:00 am	2022-01-27 @ 10:00 am	0.6 ± 0.3	2022-01-31
11019892	154	2022-01-24 @ 7:00 am	2022-01-27 @ 10:00 am	0.6 ± 0.3	2022-01-31
11017896	200	2022-01-24 @ 7:00 am	2022-01-27 @ 10:00 am	< 0.3	2022-01-31
11018113	201	2022-01-24 @ 7:00 am	2022-01-27 @ 10:00 am	< 0.3	2022-01-31
11018103	202	2022-01-24 @ 7:00 am	2022-01-27 @ 10:00 am	< 0.3	2022-01-31
11019204	203	2022-01-24 @ 7:00 am	2022-01-27 @ 10:00 am	< 0.3	2022-01-31
11019895	204	2022-01-24 @ 7:00 am	2022-01-27 @ 10:00 am	< 0.3	2022-01-31
11020029	205	2022-01-24 @ 7:00 am	2022-01-27 @ 10:00 am	< 0.3	2022-01-31

Radon test result report for:
LAKEVIEW HIGH SCHOOL
K-12

Kit #	Room Id	Started	Ended	pCi/L	Analyzed
11019893	206	2022-01-24 @ 6:00 am	2022-01-27 @ 10:00 am	< 0.3	2022-01-31
11017891	207	2022-01-24 @ 6:00 am	2022-01-27 @ 10:00 am	< 0.3	2022-01-31
11021089	208	2022-01-24 @ 6:00 am	2022-01-27 @ 10:00 am	< 0.3	2022-01-31
11018114	208	2022-01-24 @ 7:00 am	2022-01-27 @ 10:00 am	< 0.3	2022-01-31
11018294	209	2022-01-24 @ 7:00 am	2022-01-27 @ 10:00 am	< 0.3	2022-01-31
11018104	211	2022-01-24 @ 7:00 am	2022-01-27 @ 10:00 am	< 0.3	2022-01-31
11018116	212	2022-01-24 @ 7:00 am	2022-01-27 @ 10:00 am	< 0.3	2022-01-31
11018101	253	2022-01-24 @ 6:00 am	2022-01-27 @ 10:00 am	0.9 ± 0.4	2022-01-31
11019448	254	2022-01-24 @ 6:00 am	2022-01-27 @ 10:00 am	< 0.3	2022-01-31
11018110	255	2022-01-24 @ 6:00 am	2022-01-27 @ 10:00 am	0.5 ± 0.3	2022-01-31
11019878	256	2022-01-24 @ 6:00 am	2022-01-27 @ 10:00 am	0.7 ± 0.3	2022-01-31
11017887	257	2022-01-24 @ 6:00 am	2022-01-27 @ 10:00 am	0.7 ± 0.3	2022-01-31
11018297	258	2022-01-24 @ 6:00 am	2022-01-27 @ 11:00 am	0.6 ± 0.3	2022-01-31
11020869	259	2022-01-24 @ 6:00 am	2022-01-27 @ 10:00 am	< 0.3	2022-01-31
11018112	260	2022-01-24 @ 6:00 am	2022-01-27 @ 10:00 am	< 0.3	2022-01-31
11017897	262	2022-01-24 @ 6:00 am	2022-01-27 @ 10:00 am	< 0.3	2022-01-31
11019477	302	2022-01-24 @ 9:00 am	2022-01-27 @ 11:00 am	< 0.3	2022-01-31
11017900	303	2022-01-24 @ 6:00 am	2022-01-27 @ 11:00 am	< 0.3	2022-01-31
11017889	305	2022-01-24 @ 6:00 am	2022-01-27 @ 11:00 am	< 0.3	2022-01-31
11019889	306	2022-01-24 @ 7:00 am	2022-01-27 @ 10:00 am	< 0.3	2022-01-31
11019885	307	2022-01-24 @ 9:00 am	2022-01-27 @ 11:00 am	0.7 ± 0.3	2022-01-31
11019880	309	2022-01-24 @ 9:00 am	2022-01-27 @ 10:00 am	< 0.3	2022-01-31
11020024	310	2022-01-24 @ 9:00 am	2022-01-27 @ 10:00 am	< 0.3	2022-01-31
11019896	320	2022-01-24 @ 7:00 am	2022-01-27 @ 10:00 am	< 0.3	2022-01-31
11019210	321	2022-01-24 @ 7:00 am	2022-01-27 @ 10:00 am	< 0.3	2022-01-31
11019875	322	2022-01-24 @ 7:00 am	2022-01-27 @ 10:00 am	< 0.3	2022-01-31
11019897	323	2022-01-24 @ 7:00 am	2022-01-27 @ 10:00 am	< 0.3	2022-01-31
11018119	324	2022-01-24 @ 7:00 am	2022-01-27 @ 10:00 am	< 0.3	2022-01-31
11019871	326	2022-01-24 @ 7:00 am	2022-01-27 @ 10:00 am	< 0.3	2022-01-31
11020030	327	2022-01-24 @ 7:00 am	2022-01-27 @ 10:00 am	< 0.3	2022-01-31
11019877	328	2022-01-24 @ 7:00 am	2022-01-27 @ 10:00 am	< 0.3	2022-01-31
11019898	329	2022-01-24 @ 7:00 am	2022-01-27 @ 9:00 am	< 0.3	2022-01-31
11019883	330	2022-01-24 @ 7:00 am	2022-01-27 @ 10:00 am	< 0.3	2022-01-31
11019881	332	2022-01-24 @ 7:00 am	2022-01-27 @ 10:00 am	< 0.3	2022-01-31
11019899	333	2022-01-24 @ 7:00 am	2022-01-27 @ 10:00 am	< 0.3	2022-01-31
11019887	334	2022-01-24 @ 7:00 am	2022-01-27 @ 10:00 am	0.5 ± 0.4	2022-01-31
11019900	335	2022-01-24 @ 7:00 am	2022-01-27 @ 10:00 am	< 0.3	2022-01-31

Radon test result report for:
LAKEVIEW HIGH SCHOOL
K-12

Kit #	Room Id	Started	Ended	pCi/L	Analyzed
11019469	408	2022-01-24 @ 8:00 am	2022-01-27 @ 9:00 am	< 0.3	2022-01-31
11019208	409	2022-01-24 @ 8:00 am	2022-01-27 @ 9:00 am	< 0.3	2022-01-31
11021091	411	2022-01-24 @ 8:00 am	2022-01-27 @ 9:00 am	< 0.3	2022-01-31
11019447	416	2022-01-24 @ 8:00 am	2022-01-27 @ 9:00 am	< 0.3	2022-01-31
11019471	419	2022-01-24 @ 8:00 am	2022-01-27 @ 9:00 am	< 0.3	2022-01-31
11019879	419B	2022-01-24 @ 8:00 am	2022-01-27 @ 9:00 am	< 0.3	2022-01-31
11019894	450 A	2022-01-24 @ 8:00 am	2022-01-27 @ 9:00 am	0.9 ± 0.3	2022-01-31
11019465	450 B	2022-01-24 @ 8:00 am	2022-01-27 @ 9:00 am	< 0.3	2022-01-31
11019459	451	2022-01-24 @ 8:00 am	2022-01-27 @ 9:00 am	0.6 ± 0.4	2022-01-31
11021068	451B	2022-01-24 @ 8:00 am	2022-01-27 @ 9:00 am	< 0.3	2022-01-31
11019484	453	2022-01-24 @ 8:00 am	2022-01-27 @ 9:00 am	0.7 ± 0.3	2022-01-31
11019489	500 D PRACTICE ROOM	2022-01-24 @ 8:00 am	2022-01-27 @ 9:00 am	< 0.3	2022-01-31
11021094	503 C PRACTICE ROOM	2022-01-24 @ 8:00 am	2022-01-27 @ 9:00 am	0.8 ± 0.3	2022-01-31
11021096	503 D BAND PRACTICE ROOM	2022-01-24 @ 8:00 am	2022-01-27 @ 9:00 am	< 0.3	2022-01-31
11018102	AUDITORIUM A	2022-01-24 @ 8:00 am	2022-01-27 @ 9:00 am	< 0.3	2022-01-31
11020027	AUDITORIUM B	2022-01-24 @ 8:00 am	2022-01-27 @ 9:00 am	0.7 ± 0.4	2022-01-31
11021099	AUDITORIUM C	2022-01-24 @ 8:00 am	2022-01-27 @ 9:00 am	< 0.3	2022-01-31
11019457	AUDITORIUM D	2022-01-24 @ 8:00 am	2022-01-27 @ 9:00 am	0.6 ± 0.4	2022-01-31
11020023	BAND A	2022-01-24 @ 8:00 am	2022-01-27 @ 9:00 am	< 0.3	2022-01-31
11021097	BAND B	2022-01-24 @ 8:00 am	2022-01-27 @ 9:00 am	< 0.3	2022-01-31
11019492	CHOIR A	2022-01-24 @ 8:00 am	2022-01-27 @ 9:00 am	< 0.3	2022-01-31
11019453	CHOIR B	2022-01-24 @ 8:00 am	2022-01-27 @ 9:00 am	< 0.3	2022-01-31
11021071	CHOIR/BAND OFFICE	2022-01-24 @ 8:00 am	2022-01-27 @ 9:00 am	< 0.3	2022-01-31
11019461	COMMONS A	2022-01-24 @ 8:00 am	2022-01-27 @ 9:00 am	< 0.3	2022-01-31
11019462	COMMONS B	2022-01-24 @ 8:00 am	2022-01-27 @ 9:00 am	< 0.3	2022-01-31
11017892	COMMONS C	2022-01-24 @ 8:00 am	2022-01-27 @ 9:00 am	< 0.3	2022-01-31
11017893	COMMONS D	2022-01-24 @ 8:00 am	2022-01-27 @ 9:00 am	< 0.3	2022-01-31
11017096	D117-6	2022-01-24 @ 7:00 am	2022-01-27 @ 10:00 am	< 0.3	2022-01-31
11018299	D121-2	2022-01-24 @ 6:00 am	2022-01-27 @ 10:00 am	< 0.3	2022-01-31
11018300	D129-3	2022-01-24 @ 7:00 am	2022-01-27 @ 9:00 am	< 0.3	2022-01-31
11018107	D153-4	2022-01-24 @ 7:00 am	2022-01-27 @ 10:00 am	0.8 ± 0.3	2022-01-31
11017888	D258-1	2022-01-24 @ 6:00 am	2022-01-27 @ 10:00 am	< 0.3	2022-01-31
11019479	D307-13	2022-01-24 @ 9:00 am	2022-01-27 @ 11:00 am	< 0.3	2022-01-31
11019886	D320-5	2022-01-24 @ 7:00 am	2022-01-27 @ 10:00 am	< 0.3	2022-01-31
11021093	D411-9	2022-01-24 @ 8:00 am	2022-01-27 @ 9:00 am	< 0.3	2022-01-31
11019205	D416-8	2022-01-24 @ 8:00 am	2022-01-27 @ 9:00 am	< 0.3	2022-01-31
11020013	D419B-7	2022-01-24 @ 8:00 am	2022-01-27 @ 9:00 am	< 0.3	2022-01-31

Radon test result report for:
LAKEVIEW HIGH SCHOOL
K-12

Kit #	Room Id	Started	Ended	pCi/L	Analyzed
11021092	D451-10	2022-01-24 @ 8:00 am	2022-01-27 @ 9:00 am	< 0.3	2022-01-31
11019478	DHIGH SCHOOL OFFICE-12	2022-01-24 @ 9:00 am	2022-01-27 @ 10:00 am	0.6 ± 0.3	2022-01-31
11021087	DKITCHEN OFFICE-11	2022-01-24 @ 8:00 am	2022-01-27 @ 9:00 am	< 0.3	2022-01-31
11019450	ELEMENTARY GYM A	2022-01-24 @ 9:00 am	2022-01-27 @ 9:00 am	1.8 ± 0.4	2022-01-31
11021095	ELEMENTARY GYM B	2022-01-24 @ 9:00 am	2022-01-27 @ 9:00 am	0.9 ± 0.4	2022-01-31
11021090	ELEMENTARY GYM C	2022-01-24 @ 9:00 am	2022-01-27 @ 9:00 am	1.0 ± 0.4	2022-01-31
11019467	ELEMENTARY GYM D	2022-01-24 @ 9:00 am	2022-01-27 @ 9:00 am	1.5 ± 0.3	2022-01-31
11018111	ELEMENTARY OFFICE LOBBY	2022-01-24 @ 7:00 am	2022-01-27 @ 11:00 am	0.7 ± 0.3	2022-01-31
11017898	FSTORAGE ROOM A	2022-01-24 @ 6:00 am	2022-01-27 @ 8:00 am	< 0.3	2022-01-31
9555701	FSTORAGE ROOM B	2022-01-24 @ 6:00 am	2022-01-27 @ 8:00 am	< 0.3	2022-01-31
9568508	FSTORAGE ROOM C	2022-01-24 @ 6:00 am	2022-01-27 @ 8:00 am	< 0.3	2022-01-31
11019872	GYM 400 A	2022-01-24 @ 8:00 am	2022-01-27 @ 9:00 am	0.6 ± 0.3	2022-01-31
11020026	GYM 400 B	2022-01-24 @ 8:00 am	2022-01-27 @ 9:00 am	0.6 ± 0.3	2022-01-31
11019884	GYM 400 C	2022-01-24 @ 8:00 am	2022-01-27 @ 9:00 am	< 0.3	2022-01-31
11019446	GYM 400 D	2022-01-24 @ 8:00 am	2022-01-27 @ 9:00 am	< 0.3	2022-01-31
11019480	HIGH SCHOOL OFFICE	2022-01-24 @ 9:00 am	2022-01-27 @ 10:00 am	< 0.3	2022-01-31
11017894	KITCHEN	2022-01-24 @ 8:00 am	2022-01-27 @ 9:00 am	< 0.3	2022-01-31
11019464	KITCHEN OFFICE	2022-01-24 @ 8:00 am	2022-01-27 @ 9:00 am	1.0 ± 0.3	2022-01-31
11019202	MAIN GYM A	2022-01-24 @ 8:00 am	2022-01-27 @ 9:00 am	< 0.3	2022-01-31
11021100	MAIN GYM B	2022-01-24 @ 8:00 am	2022-01-27 @ 9:00 am	0.6 ± 0.3	2022-01-31
11019882	MAIN GYM C	2022-01-24 @ 8:00 am	2022-01-27 @ 9:00 am	0.7 ± 0.4	2022-01-31
11021083	MAIN GYM D	2022-01-24 @ 8:00 am	2022-01-27 @ 9:00 am	0.5 ± 0.3	2022-01-31
11019460	MAIN GYM E	2022-01-24 @ 8:00 am	2022-01-27 @ 9:00 am	0.6 ± 0.3	2022-01-31
11017097	MEDIA CENTER A	2022-01-24 @ 7:00 am	2022-01-27 @ 10:00 am	< 0.3	2022-01-31
11021098	MEDIA CENTER B	2022-01-24 @ 7:00 am	2022-01-27 @ 10:00 am	< 0.3	2022-01-31
9568510	OSTORAGE ROOM A	2022-01-24 @ 6:00 am	2022-01-27 @ 8:00 am	< 0.3	2022-01-31
9568509	OSTORAGE ROOM B	2022-01-24 @ 6:00 am	2022-01-27 @ 8:00 am	< 0.3	2022-01-31
9573608	OSTORAGE ROOM C	2022-01-24 @ 6:00 am	2022-01-27 @ 8:00 am	< 0.3	2022-01-31
11020025	WEIGHT ROOM	2022-01-24 @ 8:00 am	2022-01-27 @ 9:00 am	< 0.3	2022-01-31

3900

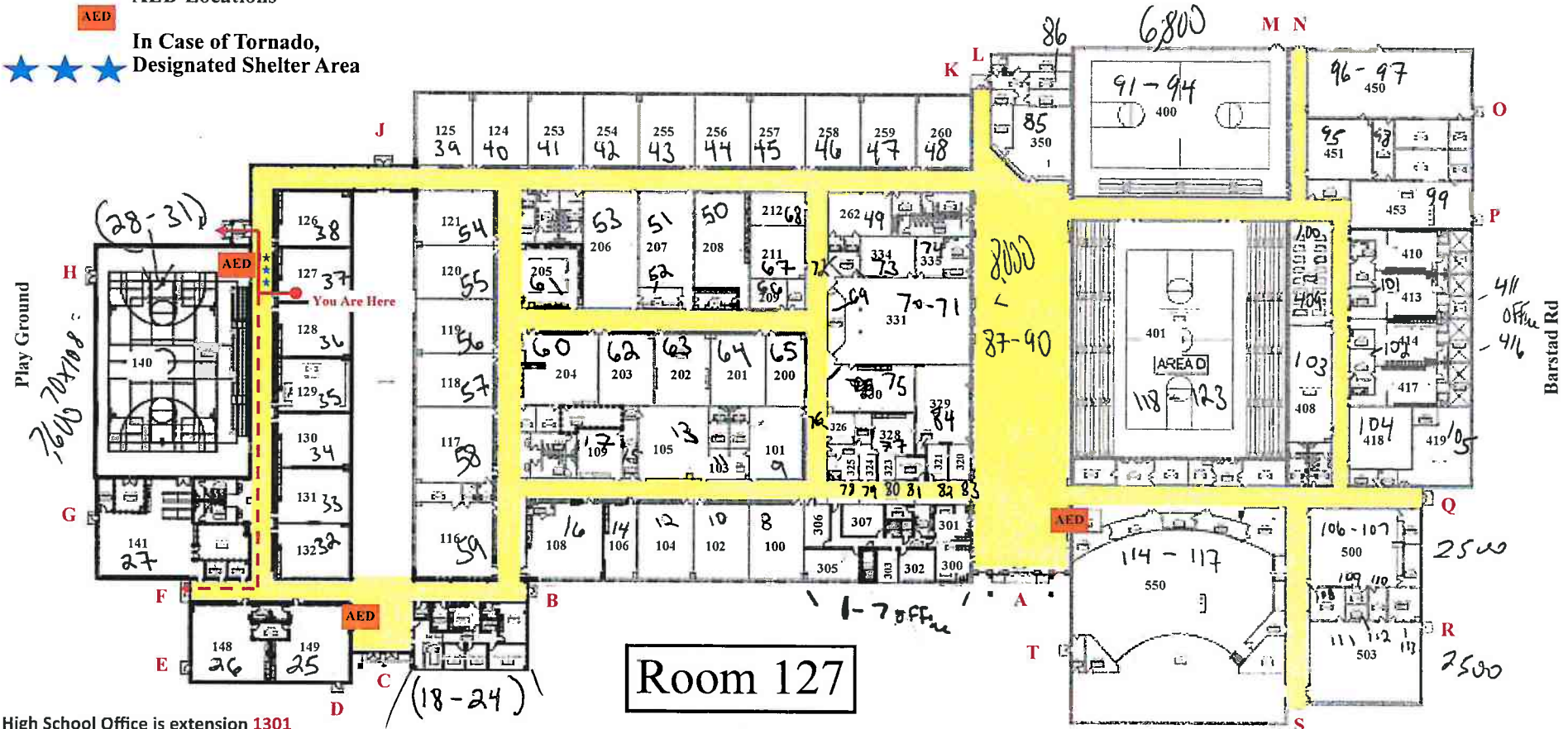
Radon Lakeview

2003 Year Built

Emergency Evacuation Map



- Primary Emergency Exit
- Secondary Emergency Exit
- AED Locations
- In Case of Tornado, Designated Shelter Area



High School Office is extension 1301
 Elementary Office is extension 1150
 District Office extension is 1300
 Outside number you must dial 9 first
 Dial 9 911 for an emergency

Room 127

Parking Lot

Lakeview School 875 Barstad Rd
Cottonwood, MN

Handwritten notes and calculations:

- 123
- 2buff
- 125
- 13 dup
- omit
- 145
- Total

Play Ground
766 70x108

(18-24)
OFFICE

8000
87-90

6800

2500

2500

Barstad Rd

Appendix C

Signed Non-Interference Agreement

NOTICE OF INSPECTION FOR ALL FACILITATING STAFF

A radon test is scheduled for:

Building: Lakeview Public Schools

Test Start Date: 1/24/2022 Test End Date: 1/27/2022

Please help to maintain the required test conditions throughout the building

1. All windows and exterior doors must be kept closed (aside from momentary entry or exit) for 12 hours before and during the test.
2. Heating and cooling systems must be set to normal occupied operating temperatures.
3. Test devices are not to be disturbed.

Further guidance on required building conditions are located on the next page.

Test devices are not dangerous in anyway. The type of devices used for this testing will include:

Short-term test kits. It is important that these devices are fully open and not covered. They will be analyzed by a laboratory.

Continuous radon monitors. These are electronic devices that record hourly radon readings.

Long-term test kits. It is important that these devices are not covered. They will be analyzed by a laboratory.

Declaration of Observed Compliance

Failure to reasonably maintain test conditions can lead to unnecessary expense, disruptions and unreliable data. Disturbing test devices can also cause unreliable or invalid test results.

- Please report in a timely manner if required test conditions are not maintained.
- Please sign and return this form once the test is complete.

To the best of my knowledge, the required conditions were maintained during the test.

Yes No

Name: Darrell Dirckx

Signature: Darrell Dirckx

For more information regarding on-site activities, contact:

Licensed Measurement Professional:

More Detailed Guidance for Staff

Required Closed-Building Conditions	
Windows	Keep Closed, Seal broken windows closed
External doors (except for normal entry or exit)	Keep Closed
Heating & Cooling Systems	Set to normal operating conditions
Bathroom fans	Operate normally
Fireplaces (including gas)	Do not operate
Auxiliary or temporary systems that bring air into the building	Do not operate (unless an integral part of HVAC or supplies make-up air for combustion appliances)
Exhaust systems (ex. from shops, laundries, kitchens)	Avoid excessive operation
Interior doors, Stairwells, Fire Doors	Operate Normally
Garage doors	Operate normally
Ceiling Fans, Portable Fans	Do not blow directly on the test device
Window AC Units	Operate in recirculation mode only
Window Fans	Do not operate. Seal shut or remove.
Humidifiers, Dehumidifiers, Portable Air Cleaners	Operate Normally
Central Vacuum Cleaner Systems	Operate Normally
Passive crawl space vents	Operate normally
Crawlspace exhaust systems for humidity control	Operate normally
Passive Vents for Combustion Make-Up Air	Leave Open
Combustion Appliance Vents	Operate Normally
Passive Solar Systems	Operate Normally
Attic Vent Fans	Operate Normally
Evaporative Cooling Systems	Do not operate

More Detailed Guidance for Staff

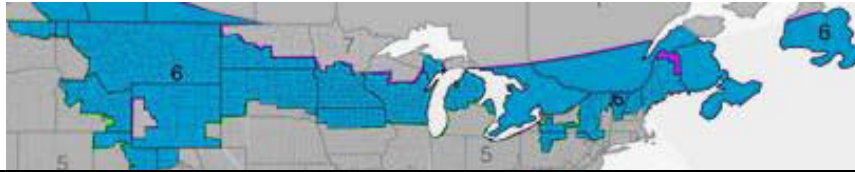
Requirements for Test Locations Within a Room	
Place detectors within the general breathing zone Locate detectors no less than :	3 feet from exterior doors, windows or other openings to the outdoors
	20 inches above the floor
	4 inches from other test devices and objects
	1 foot below the ceiling
Place detectors where they are not easily disturbed:	Select a place in an occupied area where the detectors are unlikely to be moved
Place detectors where they are not influenced by other factors:	Do not place devices in closets, crawlspaces, cupboards, sumps or nooks within building foundations
	Do not place devices in area with high air movement (ex. mechanical areas, furnace closets)
	Do not place devices in areas of high humidity (ex. kitchens, bathrooms, laundry rooms)
	Do not place devices near drafts from HVAC systems or fans
	Do not place test devices near heat sources (ex. appliances, radiators, fireplaces, direct sunlight)
	Do not place detectors on devices that produce radiation (ex. natural stone counters, pool tables, rock collections)

Appendix D

Average Building Operating Conditions Comparison

Southern MN

Climate Zone 6 (includes Southern MN)



		Averages			During the Test
		24 Hour	Daytime	Daytime 9-Month	Prevailing During the Test
Operating Condition	Outdoor Temperature	45 °F	50 °F	N/A	21 °F
	Heating Conditions	75%	66%	88%	70 °F
	Cooling Conditions	-	16%	11%	N/A
	Mixed Conditions	25%	16%	-	N/A
Normal Operating Condition		<ul style="list-style-type: none"> • Heating conditions • No variance in outdoor air ventilation 			<ul style="list-style-type: none"> • Heating conditions • No variance in outdoor air ventilation
Condition less likely to inhibit characterization of a radon hazard		<ul style="list-style-type: none"> • Heating and air distribution systems active 			<ul style="list-style-type: none"> • Heating and air distribution systems active

Appendix E

MDH Reporting Form

School Radon Testing Reporting Form

According to Minnesota Statute 123B.571 subd. 3, a school district that has tested its school buildings for the presence of radon shall report the results of its tests to the Department of Health. Please use this form to submit information about the most recent round or cycle of testing conducted for each building.

Instructions

1. Complete one form for each building tested. In this case, a building is defined as an occupied facility with a unique address. This includes administrative buildings.
2. Include this form, raw data (e.g. laboratory report) and a building map.
3. Submit this form when all work is completed for a round of testing. This includes reporting to the school board, and follow-up testing and post-mitigation testing, if applicable.
4. Email information to health.indoorair@state.mn.us.

Contact Information

Name:	
Mailing Address:	
Phone:	Email:

Initial Radon Testing Information

School Building Name:	
School District & District Number:	
Building Address:	
Test Kit Manufacturer:	Device Name:
Date of Kit Retrieval (DD/MM/YY):	Length of Test (days):
How many rooms were tested?	
Does the test period include weekends? <input type="checkbox"/> Yes <input type="checkbox"/> No	
Does the test period include school breaks or holidays? <input type="checkbox"/> Yes <input type="checkbox"/> No	

SCHOOL RADON TESTING REPORTING FORM

Were all frequently-occupied ground contact rooms tested? ¹ <input type="checkbox"/> Yes <input type="checkbox"/> No If no, did you attempt to test all frequently occupied ground contact rooms, meaning test kits were placed in all these rooms? <input type="checkbox"/> Yes <input type="checkbox"/> No
How many rooms had results ≥ 4 pCi/L?:
Were the results reported at a school board meeting? <input type="checkbox"/> Yes <input type="checkbox"/> No

Follow-up Testing, Mitigation, & Post-Mitigation Testing

If one or more rooms tested ≥ 4 pCi/L, please answer the questions below:

How many rooms had follow-up testing?:		
Number of rooms with follow-up results	≥ 4 pCi/L:	< 4 pCi/L:
Of the rooms that had test results ≥ 4 pCi/L, how many rooms were:		
mitigated by HVAC balancing or operational changes? :		
mitigated by installation of active soil depressurization?:		
addressed through other corrective measures? ² :		
What was the cost of the installation and/or HVAC service work, to mitigate radon? \$		
What is the known or anticipated annual operating cost of mitigation (estimate)? \$		
After radon mitigation, how many rooms were retested?:		
Post mitigation results (# of rooms)	≥ 4 pCi/L:	< 4 pCi/L:

¹ This includes classrooms, offices, break rooms, laboratories, cafeterias, libraries, auditoriums, gymnasiums, etc. It includes rooms on grade and rooms above unoccupied spaces that are in contact with the ground, such as rooms above storage rooms, crawl spaces, tunnels, and boiler rooms. If only a sample or portion of rooms were tested, then respond with 'no'.

² 'Other corrective measures' could include moving staff out of a room and making a room unoccupied or trying to seal radon entry points.