Radon Measurement Assessment Report

Prepared for:
Ann Arbor Housing Commission
727 Miller Avenue
Ann Arbor, MI 48103

Project location:
River Run LDHA – Hikone
2701-2760 Hikone Drive
Ann Arbor, MI 48104

PE Project Number:
MI22-706

Prepared by:
Protect Environmental
9822 Bluegrass Parkway
Louisville, KY 40299
Phone: 502-410-5000
ProtectEnvironmental.com

Report Date:
August 22, 2022

Prepared by:

Keith Hoylman
Protect Environmental

Preparation Date: August 22, 2022

This assessment report was developed specifically for the radon measurement conducted at River Run LDHA – Hikone, 2702-2760 Hikone Drive, Ann Arbor, MI 48104. The measurement was conducted in accordance with the document *Protocol for Conducting Radon and Radon Decay Product Measurements in Multifamily Buildings (ANSI/AARST MAMF 2017)* by Jimmy Rogers, a radon measurement professional credentialed by the National Radon Proficiency Program (NRPP).

Please direct inquiries regarding this report to Jennifer Sims at 502-272-2662 or Jennifer@ProtectEnv.com.

Keith Hoylman
Radon Professional
NRPP Certification Number: RMT-109309

Contents

Appendices

Section 1.0 – Introduction and Summary

1.1 Purpose

Radon is a colorless, odorless, radioactive gas formed through the decay of uranium. Trace amounts of uranium is present in all soil, and radon is found all over the planet. Most of this gas remains underground, but a small percentage migrates to the surface. Most radon is diluted in the atmosphere to very low concentrations but can build up to high concentrations in buildings. The amount of radon intruding into a building depends on the strength of the source, preferential pathways into the building, and a driving force (usually the thermal stack effect of the building). While two buildings may be identical, each site is unique. The only way to know what the radon levels are inside a building is through measurement. Two structures side-by-side can have totally different radon levels.

Radon is the second leading cause of lung cancer in the general population and the leading cause of lung cancer among non-smokers. Radon exposure is the cause of approximately 21,000 U.S. lung cancer deaths each year. This risk is largely preventable through testing and mitigation.

For more information on radon, please contact:

- The Michigan Department of Environment, Great Lakes, and Energy, Materials Management Division at **517-284-6551** or visit their website at **https://www.michigan.gov/egle/0,9429,7-135-3312_4120_4196---,00.html**
- The US Environmental Protection Agency at **1-800-767-7236** or visit their website at **https://www.epa.gov/radon**.

1.2 Property Information

Protect Environmental was engaged to conduct a radon measurement and assessment at the subject property located at River Run LDHA – Hikone, 2702-2760 Hikone Drive, Ann Arbor, MI 48104. Prior to the measurement, the client or designated representative did not indicate that active mitigation systems were currently in operation at the property.

The property is located within an EPA Zone 1 county.

EPA Zones:

- Zone 1- Average radon levels at or above 4.0 pCi/L
- Zone 2- Average radon levels between 2.0 and 3.9 pCi/L
- Zone 3- Average radon levels at or below 1.9 pCi/L

The EPA Radon Zone designation should not be used to determine if a property should be tested. All buildings should be tested for radon, regardless of location or EPA Radon Zone designation.

1.3 Measurement Summary

The measurement was conducted between August 16 and 19, 2022, and was requested as part of a due diligence project being conducted by the client. A total of 30 measurement devices to be deployed in 29 residential and 1 non-residential locations in 5 buildings were included in the measurement and quality assurance project plan. The measurement included 2 vacant locations. For quality assurance purposes, 3 duplicate and 2 field blank measurement devices were deployed. All devices were sent under appropriate chain of custody to a qualified analytical laboratory for analysis.

Findings and recommendations regarding the analytical lab results and corresponding assessment are provided in Section 6.1 of this report.

Section 2.0 – Scope of Work

The assessment includes the following scope of work components:

1. Conducting an initial planning meeting with the client to review the project scope, information necessary to build the measurement and quality assurance project plan, required conditions and on-site logistics.

2. Preparing and implementing a measurement and quality assurance project plan for the assessment, in accordance with the required measurement protocol.

3. Placing and retrieving the measurement devices, preparation of chain of custody documentation and shipping of the devices to a qualified analytical laboratory for analysis, and interpretation of the analytical laboratory data.

4. Providing the client with a written report of the measurement findings and recommendations.

Section 3.0 – Measurement Protocol and Quality Assurance

The measurement was conducted in accordance with the document *Protocol for Conducting Radon and Radon Decay Product Measurements in Multifamily Buildings (ANSI/AARST MAMF 2017)* by Jimmy Rogers, a radon measurement professional credentialed by the NRPP. Field Professional certification documentation is attached as Appendix E to this report.

Quality assurance measures were conducted in accordance with ANSI/AARST MAMF 2017. Details regarding the QA procedures implemented for this project are included in Appendix C of this report.

Section 4.0 – Measurement Devices

Activated charcoal adsorption devices manufactured by Air Chek, Inc. were utilized for the measurement. All devices were forwarded under appropriate chain of custody for analysis by Air Chek, Inc., an analytical laboratory credentialed by the NRPP. Each device was deployed in accordance with the instructions provided by the manufacturer. The chain of custody for measurement devices is available on request.

Air Chek, Inc.
1936 Butler Bridge Road
Mills River, NC 28759
NRPP License Number: 101138

Section 5.0 – Measurement Conditions

The occupant of each location at the property was notified of the required measurement conditions to be maintained during the testing event prior to device placement. The field professional also delivered notification of the required measurement conditions applicable to the testing event at the time of device placement. In addition, the responsible party for the overall testing event was notified of the required measurement conditions to be maintained during the testing event prior to device placement. Notifications are attached as Appendix G to this report.

Compliance with the measurement conditions and non-interference controls contained within the measurement protocol was verified by the field professional placing and retrieving the measurement devices. At the time of the measurement, violations of the required measurement conditions or evidence of device tampering were not observed by the field professional, unless noted within this report. Modifications to the measurement and quality assurance project plan were not made by the field professional, unless noted within this report. Weather conditions that existed during the measurement event are attached as Appendix D to this report.

Section 6.0 – Findings, Recommendations and Required Advisories

The sole purpose of this assessment is to provide the client with information regarding the indoor radon concentrations at the property at the time of the measurement. An uncertainty with any test result due to statistical variations and other factors, such as daily and seasonal variations in indoor radon concentrations, does exist. Variations may occur due to changes in weather conditions, building usage or possible unobserved interference with the required measurement conditions. Locations not occupied, able to be occupied or inaccessible at the time of the measurement were not tested. Any location not occupied, able to be occupied or inaccessible at the time of the measurement should be tested to ensure radon levels are below the EPA action level prior to future occupancy or upon accessibility, as applicable. The findings and recommendations contained within this report are derived

from information obtained from the client and their designated representative, the on-site activities and analytical services provided under the scope of work performed. No representation is made in this report regarding the operational status or proper operation of any mitigation system(s) that may be installed at the property. This measurement assessment report was prepared solely for the use of the client. Use of this report by any party other than is prohibited without prior written consent from Protect Environmental.

6.1 Findings and Recommendations

Based on the analytical lab results, the locations contain indoor radon concentrations below the EPA action level of 4.0 pCi/L. The measurement result in 1 location was invalid but meets the clearance criteria for the project. The quality assurance plan for the project was in control. No additional action is recommended.

6.2 Required Advisories

When a location is indicated to have radon levels below the EPA action level of 4.0 pCi/L:

1. If the location is indicated to have radon levels below the EPA action level of 4.0 pCi/L but at or above 2.0 pCi/L, consider mitigation of the building.

2. When the initial measurement is conducted under non-heating season conditions, follow-up measurement of all buildings under heating season at the earliest opportunity, and no later than 5 years after the initial measurement is recommended.

3. Consideration is recommended to alternate future measurements to obtain results under a different season that represents a significant portion of the yearlong operating condition for the building.

4. A follow-up measurement is recommended at least every 5 years and in conjunction with the sale of a building(s); a new addition is constructed or significant alterations occur; a ground-contact location not previously tested is occupied; HVAC systems are altered with resulting changes to air distribution or pressure relationship; ventilation is altered by extensive weatherization or changes to mechanical systems; sizeable openings due to ground water or slab surface water control systems are added or altered; natural settlement causing major cracks develops; earthquakes or construction blasting occur nearby; a mitigation system is altered, repaired or modified.

Appendix A

Analytical Laboratory Report

P5179 / KYLE HOYLMAN

Kit Number	Start Date	Start Time	End Date	End Time	Temp.	Facility	Building	Room	Project ID	Floor	Result
11202492	2022-08-16	4:00 pm	2022-08-19	9:00 am	70	RIVER RUN LDHA-HIKONE	2714-2724 HIKONE DR	2714		1	< 0.3
11202495	2022-08-16	4:00 pm	2022-08-19	9:00 am	70	RIVER RUN LDHA-HIKONE	2714-2724 HIKONE DR	2714		1	1.3
11202496	2022-08-16	4:00 pm	2022-08-19	9:00 am	70	RIVER RUN LDHA-HIKONE	2714-2724 HIKONE DR	2716		1	0.8
11224204	2022-08-17	9:00 am	2022-08-19	9:00 am	70	RIVER RUN LDHA-HIKONE	2738-2748 HIKONE DR	2742		1	1.1
11224205	2022-08-16	4:00 pm	2022-08-19	9:00 am	70	RIVER RUN LDHA-HIKONE	2726-2736 HIKONE DR	2734		1	1.0
11224206	2022-08-16	4:00 pm	2022-08-19	9:00 am	70	RIVER RUN LDHA-HIKONE	2726-2736 HIKONE DR	2732		1	0.7
11224207	2022-08-17	9:00 am	2022-08-19	9:00 am	70	RIVER RUN LDHA-HIKONE	2750-2760 HIKONE DR	2750		1	2.0
11224208	2022-08-17	9:00 am	2022-08-19	9:00 am	70	RIVER RUN LDHA-HIKONE	2738-2748 HIKONE DR	2744		1	< 0.3
11224209	2022-08-17	9:00 am	2022-08-19	9:00 am	70	RIVER RUN LDHA-HIKONE	2738-2748 HIKONE DR	2738		1	2.2
11224210	2022-08-16	4:00 pm	2022-08-19	9:00 am	70	RIVER RUN LDHA-HIKONE	2702-2712 HIKONE DR	2712		1	< 0.3
11224211	2022-08-16	4:00 pm	2022-08-19	9:00 am	70	RIVER RUN LDHA-HIKONE	2702-2712 HIKONE DR	2702		1	0.8
11224212	2022-08-16	4:00 pm	2022-08-19	9:00 am	70	RIVER RUN LDHA-HIKONE	2726-2736 HIKONE DR	2736		1	0.9
11224213	2022-08-16	4:00 pm	2022-08-19	9:00 am	70	RIVER RUN LDHA-HIKONE	2726-2736 HIKONE DR	2728		1	1.8
11224214	2022-08-16	4:00 pm	2022-08-19	9:00 am	70	RIVER RUN LDHA-HIKONE	2726-2736 HIKONE DR	2730		1	0.7
11224215	2022-08-16	4:00 pm	2022-08-19	9:00 am	70	RIVER RUN LDHA-HIKONE	2702-2712 HIKONE DR	2706		1	0.8
11224216	2022-08-16	4:00 pm	2022-08-19	9:00 am	70	RIVER RUN LDHA-HIKONE	2726-2736 HIKONE DR	2726		1	1.1
11224217	2022-08-16	4:00 pm	2022-08-19	9:00 am	70	RIVER RUN LDHA-HIKONE	2702-2712 HIKONE DR	2710		1	0.5
11224218	2022-08-16	4:00 pm	2022-08-19	9:00 am	70	RIVER RUN LDHA-HIKONE	2702-2712 HIKONE DR	2704		1	1.2
11224219	2022-08-16	4:00 pm	2022-08-19	9:00 am	70	RIVER RUN LDHA-HIKONE	2702-2712 HIKONE DR	2704		1	1.2
11224220	2022-08-16	4:00 pm	2022-08-19	9:00 am	70	RIVER RUN LDHA-HIKONE	2702-2712 HIKONE DR	2706		1	1.1
11224221	2022-08-16	4:00 pm	2022-08-19	9:00 am	70	RIVER RUN LDHA-HIKONE	2702-2712 HIKONE DR	2708		1	0.9
11224222	2022-08-16	4:00 pm	2022-08-19	9:00 am	70	RIVER RUN LDHA-HIKONE	2714-2724 HIKONE DR	2722		1	0.8
11224223	2022-08-16	4:00 pm	2022-08-19	9:00 am	70	RIVER RUN LDHA-HIKONE	2714-2724 HIKONE DR	2720		1	0.9
11224224	2022-08-16	4:00 pm	2022-08-19	9:00 am	70	RIVER RUN LDHA-HIKONE	2702-2712 HIKONE DR	2702		1	< 0.3
11224226	2022-08-16	4:00 pm	2022-08-19	9:00 am	70	RIVER RUN LDHA-HIKONE	2714-2724 HIKONE DR	2716		1	0.6
11224229	2022-08-16	4:00 pm	2022-08-19	9:00 am	70	RIVER RUN LDHA-HIKONE	2714-2724 HIKONE DR	2724 OFFICE		1	< 0.3
11224232	2022-08-17	9:00 am	2022-08-19	9:00 am	70	RIVER RUN LDHA-HIKONE	2738-2748 HIKONE DR	2746		1	0.8
11224233	2022-08-16	4:00 pm	2022-08-19	9:00 am	70	RIVER RUN LDHA-HIKONE	2714-2724 HIKONE DR	2718		1	0.5
11224242	2022-08-17	9:00 am	2022-08-19	9:00 am	70	RIVER RUN LDHA-HIKONE	2750-2760 HIKONE DR	2758		1	1.7
11224243	2022-08-17	9:00 am	2022-08-19	9:00 am	70	RIVER RUN LDHA-HIKONE	2750-2760 HIKONE DR	2760		1	0.7
11224244	2022-08-17	9:00 am	2022-08-19	9:00 am	70	RIVER RUN LDHA-HIKONE	2750-2760 HIKONE DR	2756		1	1.8
11224250	2022-08-17	9:00 am	2022-08-19	9:00 am	70	RIVER RUN LDHA-HIKONE	2750-2760 HIKONE DR	2754		1	2.3
11224251	2022-08-17	9:00 am	2022-08-19	9:00 am	70	RIVER RUN LDHA-HIKONE	2738-2748 HIKONE DR	2748		1	1.9
11224252	2022-08-17	9:00 am	2022-08-19	9:00 am	70	RIVER RUN LDHA-HIKONE	2750-2760 HIKONE DR	2752		1	1.5

Appendix B

Device Placement Log

Device Placement Log

Facility:	River Run LDHA-Hikone			RES Devices:	29	Placement Arrival:	4:00PM /9:00 AM
Address:	2702-2760 Hikone Drive, Ann Arbor, MI 48104			NR Devices:	1	Placement Departure:	4:00PM /900 AM
Contact:	Tim Olivier: 734-794-6720			Duplicate Devices:	3	Retrieval Arrival:	9:00 AM
Placement Day/Type/Pro:	8/16-17/2022	ST	Jimmy Rogers	Blank Devices:	2	Retrieval Departure:	9:00 AM
Retrieval Day/Type/Pro:	8/19/2022	ST	Jimmy Rogers	Total Devices:	35	Ship Info:	FedEx: 1-Day
Standard:	MAMF 2017	Project Type:	HUD, Initial 100%	Shipped Devices:	34	Ship Date:	8/19/2022

Kit Number	Start Date	Start Time	End Date	End Time	Temp	Building	Room	Floor	Vacant	Notes
11224229	8/16/2022	4:00 PM	8/19/2022	9:00 AM	70	2714-2724 Hikone Dr	2724 Office	1		
11202495	8/16/2022	4:00 PM	8/19/2022	9:00 AM	70	2714-2724 Hikone Dr	2714	1	X	
11202492	8/16/2022	4:00 PM	8/19/2022	9:00 AM	70	2714-2724 Hikone Dr	2714 FIELD BLANK	1	X	
11202496	8/16/2022	4:00 PM	8/19/2022	9:00 AM	70	2714-2724 Hikone Dr	2716	1		
11224226	8/16/2022	4:00 PM	8/19/2022	9:00 AM	70	2714-2724 Hikone Dr	2716 DUPLICATE	1		
11224233	8/16/2022	4:00 PM	8/19/2022	9:00 AM	70	2714-2724 Hikone Dr	2718	1		
11224223	8/16/2022	4:00 PM	8/19/2022	9:00 AM	70	2714-2724 Hikone Dr	2720	1		
11224222	8/16/2022	4:00 PM	8/19/2022	9:00 AM	70	2714-2724 Hikone Dr	2722	1		
11224211	8/16/2022	4:00 PM	8/19/2022	9:00 AM	70	2702-2712 Hikone Dr	2702	1		
11224224	8/16/2022	4:00 PM	8/19/2022	9:00 AM	70	2702-2712 Hikone Dr	2702 FIELD BLANK	1		

11224218	8/16/2022	4:00 PM	8/19/2022	9:00 AM	70	2702-2712 Hikone Dr	2704	1		
11224219	8/16/2022	4:00 PM	8/19/2022	9:00 AM	70	2702-2712 Hikone Dr	2704 DUPLICATE	1		
11224220	8/16/2022	4:00 PM	8/19/2022	9:00 AM	70	2702-2712 Hikone Dr	2706	1		
11224215	8/16/2022	4:00 PM	8/19/2022	9:00 AM	70	2702-2712 Hikone Dr	2706 DUPLICATE	1		
11224221	8/16/2022	4:00 PM	8/19/2022	9:00 AM	70	2702-2712 Hikone Dr	2708	1		
11224217	8/16/2022	4:00 PM	8/19/2022	9:00 AM	70	2702-2712 Hikone Dr	2710	1		
11224210	8/16/2022	4:00 PM	8/19/2022	9:00 AM	70	2702-2712 Hikone Dr	2712	1		
11224216	8/16/2022	4:00 PM	8/19/2022	9:00 AM	70	2726-2736 Hikone Dr	2726	1		
11224213	8/16/2022	4:00 PM	8/19/2022	9:00 AM	70	2726-2736 Hikone Dr	2728	1	X	
11224214	8/16/2022	4:00 PM	8/19/2022	9:00 AM	70	2726-2736 Hikone Dr	2730	1		
11224206	8/16/2022	4:00 PM	8/19/2022	9:00 AM	70	2726-2736 Hikone Dr	2732	1		
11224205	8/16/2022	4:00 PM	8/19/2022	9:00 AM	70	2726-2736 Hikone Dr	2734	1		
11224212	8/16/2022	4:00 PM	8/19/2022	9:00 AM	70	2726-2736 Hikone Dr	2736	1		

Device Placement Log

11224209	8/17/2022	9:00 AM	8/19/2022	9:00 AM	70	2738-2748 Hikone Dr	2738	1		
11224203	8/17/2022	9:00 AM	NA	NA	NA	2738-2748 Hikone Dr	2740	1		DNR: Missing
11224204	8/17/2022	9:00 AM	8/19/2022	9:00 AM	70	2738-2748 Hikone Dr	2742	1		
11224208	8/17/2022	9:00 AM	8/19/2022	9:00 AM	70	2738-2748 Hikone Dr	2744	1		
11224232	8/17/2022	9:00 AM	8/19/2022	9:00 AM	70	2738-2748 Hikone Dr	2746	1		
11224251	8/17/2022	9:00 AM	8/19/2022	9:00 AM	70	2738-2748 Hikone Dr	2748	1		
11224207	8/17/2022	9:00 AM	8/19/2022	9:00 AM	70	2750-2760 Hikone Dr	2750	1		
11224252	8/17/2022	9:00 AM	8/19/2022	9:00 AM	70	2750-2760 Hikone Dr	2752	1		
11224250	8/17/2022	9:00 AM	8/19/2022	9:00 AM	70	2750-2760 Hikone Dr	2754	1		
11224244	8/17/2022	9:00 AM	8/19/2022	9:00 AM	70	2750-2760 Hikone Dr	2756	1		
11224242	8/17/2022	9:00 AM	8/19/2022	9:00 AM	70	2750-2760 Hikone Dr	2758	1		
11224243	8/17/2022	9:00 AM	8/19/2022	9:00 AM	70	2750-2760 Hikone Dr	2760	1		

Appendix C

Quality Assurance Documentation

Project Quality Assurance

Quality Assurance measures were conducted in accordance with ANSI/AARST MAMF 2017, and included:

•*Duplicate* (co-located) measurement devices deployed at a rate of 10% of the measurement locations.
- Results may not be twice or more than the co-located sample.

•*Blank* measurement devices, not exposed to indoor air, deployed at a rate of 5% of measurement locations.
- Results may not be above the calculated lower limit of detection.
- At a minimum of 50 test devices deployed, the number of blanks will be increased to 9, to include 3 laboratory blanks, 3 office blanks and 3 field blanks.
- If more than 180 test devices are deployed, the blanks will be deployed at a standard rate of 5% blanks of the measurement locations.

•*Spike* measurement devices conducted at a rate of no less than 3% of sampling locations.
- At a minimum of 100 units tested, the number of spikes increased to include 3 spiked devices from the sampling program batch to be tested and results received prior to beginning the sample deployment.

Device Location	Event Dates	Device Number	Result (pCi/L)		RPD	Device Type
2714-2724 Hikone Dr, Unit 2716	8/16/2022 to 8/19/2022	11202496 11224226	0.8 0.6	0.7	NA	Duplicate
2702-2712 Hikone Dr, Unit 2704	8/16/2022 to 8/19/2022	11224218 11224219	1.2 1.2	1.2	NA	Duplicate
2702-2712 Hikone Dr, Unit 2706	8/16/2022 to 8/19/2022	11224215 11224220	0.8 1.1	1.0	NA	Duplicate
2714-2724 Hikone Dr, Unit 2714	8/16/2022 to 8/19/2022	11202492	< 0.3		NA	Field Blank
2702-2712 Hikone Dr, Unit 2702	8/16/2022 to 8/19/2022	11224224	< 0.3		NA	Field Blank

PROTECT™
ENVIRONMENTAL

PE Job Number: 22.14

Device Range: 11201801-11203700, 10070001-10070600

Chamber Info		Storage Info	
Job Number:	205439	Radon Levels	-
Start Date:	5/14/2022	Device Numbers:	-
Stop Date:	5/16/2022	Start/Stop Date:	-
Temperature:	70.1° F	Temperature:	70–75° F
Rel. Hum:	26.9%	Rel. Hum:	30-45%

Spikes

Device	Type	Manufacture	Range	Chamber	MV	TV	IRE
11201801	AC	Air Chek	11201801-11203700	Bowser-Morner	33.1	32.7	1.2%
11202101	AC	Air Chek	11201801-11203700	Bowser-Morner	30.3	32.7	-7.3%
11202201	AC	Air Chek	11201801-11203700	Bowser-Morner	30.7	32.7	-6.1%
11202401	AC	Air Chek	11201801-11203700	Bowser-Morner	30.9	32.7	-5.5%
11202702	AC	Air Chek	11201801-11203700	Bowser-Morner	32.4	32.7	-0.9%
11202801	AC	Air Chek	11201801-11203700	Bowser-Morner	30.3	32.7	-7.3%
11203001	AC	Air Chek	11201801-11203700	Bowser-Morner	32.0	32.7	-2.1%
11203301	AC	Air Chek	11201801-11203700	Bowser-Morner	27.9	32.7	-14.7%
11203401	AC	Air Chek	11201801-11203700	Bowser-Morner	30.4	32.7	-7.0%
10070001	AC	Air Chek	10070001-10070600	Bowser-Morner	27.7	32.7	-15.3%
10070101	AC	Air Chek	10070001-10070600	Bowser-Morner	26.5	32.7	-19.0%
10070301	AC	Air Chek	10070001-10070600	Bowser-Morner	28.2	32.7	-13.8%

IRE = Individual Relative Error; MV = Measurable Value (from lab); TV = Target Value (from chamber)

Office/Lab Transit Blanks

Device	Type	Manufacture	Range	Chamber	MV	TV	In Control
11202001	AC	Air Chek	11201801-11203700	Bowser-Morner	< 0.3	< 0.3	YES
11202501	AC	Air Chek	11201801-11203700	Bowser-Morner	< 0.3	< 0.3	YES
11202901	AC	Air Chek	11201801-11203700	Bowser-Morner	< 0.3	< 0.3	YES
11203201	AC	Air Chek	11201801-11203700	Bowser-Morner	< 0.3	< 0.3	YES
11203601	AC	Air Chek	11201801-11203700	Bowser-Morner	< 0.3	< 0.3	YES
10070401	AC	Air Chek	10070001-10070600	Bowser-Morner	< 0.3	< 0.3	YES

Winnie Cheuvront
QA Coordinator

Kyle Hoylman
QA Manager

PE Job Number: 22.16

Device Range: 11222401-11224900

Chamber Info		Storage Info	
Job Number:	205888	Radon Levels	-
Start Date:	6/18/2022	Device Numbers:	-
Stop Date:	6/20/2022	Start/Stop Date:	-
Temperature:	71.4° F	Temperature:	70–75° F
Rel. Hum:	50.80%	Rel. Hum:	30-45%

Spikes

Device	Type	Manufacture	Range	Chamber	MV	TV	IRE
11222401	AC	Air Chek	11222401-11224900	Bowser-Morner	23.5	26.5	-11.3%
11222701	AC	Air Chek	11222401-11224900	Bowser-Morner	17.9	26.5	-32.5%
11222801	AC	Air Chek	11222401-11224900	Bowser-Morner	26.7	26.5	0.8%
11223001	AC	Air Chek	11222401-11224900	Bowser-Morner	26.2	26.5	-1.1%
11223301	AC	Air Chek	11222401-11224900	Bowser-Morner	25.0	26.5	-5.7%
11223401	AC	Air Chek	11222401-11224900	Bowser-Morner	25.1	26.5	-5.3%
11223601	AC	Air Chek	11222401-11224900	Bowser-Morner	23.2	26.5	-12.5%
11223901	AC	Air Chek	11222401-11224900	Bowser-Morner	21.9	26.5	-17.4%
11224001	AC	Air Chek	11222401-11224900	Bowser-Morner	25.7	26.5	-3.0%
11224301	AC	Air Chek	11222401-11224900	Bowser-Morner	22.6	26.5	-14.7%
11224501	AC	Air Chek	11222401-11224900	Bowser-Morner	24.0	26.5	-9.4%
11224801	AC	Air Chek	11222401-11224900	Bowser-Morner	22.7	26.5	-14.3%

IRE = Individual Relative Error; MV = Measurable Value (from lab); TV = Target Value (from chamber)

Office/Lab Transit Blanks

Device	Type	Manufacture	Range	Chamber	MV	TV	In Control
11222601	AC	Air Chek	11222401-11224900	Bowser-Morner	< 0.3	< 0.3	YES
11223101	AC	Air Chek	11222401-11224900	Bowser-Morner	< 0.3	< 0.3	YES
11223501	AC	Air Chek	11222401-11224900	Bowser-Morner	< 0.3	< 0.3	YES
11223801	AC	Air Chek	11222401-11224900	Bowser-Morner	< 0.3	< 0.3	YES
11224201	AC	Air Chek	11222401-11224900	Bowser-Morner	< 0.3	< 0.3	YES
11224601	AC	Air Chek	11222401-11224900	Bowser-Morner	< 0.3	< 0.3	YES

Winnie Cheuvront
QA Coordinator

Kyle Hoylman
QA Manager

Appendix D

Measurement Event Weather Conditions

Weather Summary

Facility: River Run LDHA-Hikone
Address: 2702-2760 Hikone Drive, Ann Arbor, MI 48104
Placement Day: 8/16/2022
Retrieval Day: 8/19/2022

Date	Temperature (°F) Min	Temperature (°F) Max	Temperature (°F) Avg	Precipitation (Inches) Min	Precipitation (Inches) Max	Precipitation (Inches) Avg	Ground Cover (Snow/Ice inches) Min	Ground Cover (Snow/Ice inches) Max	Ground Cover (Snow/Ice inches) AVG	Wind (Speed in mph) Min	Wind (Speed in mph) Max	Wind (Speed in mph) Avg	Humidity (%) Min	Humidity (%) Max	Humidity (%) Avg
8/15/2022	65	81	73	0	0	0	0	0	0	0	13	7	41	80	61
8/16/2022	63	81	72	0	0	0	0	0	0	0	13	7	42	81	62
8/17/2022	61	81	71	0	0	0	0	0	0	0	15	8	43	93	68
8/18/2022	60	85	73	0	0.07	0	0	0	0	0	16	8	37	93	65
8/19/2022	60	86	72	0	0.14	0	0	0	0	0	14	7	45	93	69
Overall Avg.	62	83	72	0	0.04	0	0	0	0	0	14	7	42	88	65

Appendix E

Professional Certification Documentation

Keith Hoylman
Protect Environmental, LLC

Certified for Radon Measurement

- Certified by the National Radon Proficiency Program **(NRPP)**
- NRPP Certification **#109193-RT**
- Certified since: May 10, 2017
- Certification Expires: August 31, 2023

Certified for Radon Mitigation

- Certified by the National Radon Proficiency Program **(NRPP)**
- NRPP Certification **#109309-RMT**
- Certified since: August 2, 2017
- Certification Expires: August 31, 2023

Total NRPP Training/Education Credits: 103

- Multi-Family Measurement Certificate **(MFM)**
- Multi-Family Mitigation Certificate **(MFMT)**
- Radon Resistant New Construction Certificate **(RRNC)**

American Association of Radon Scientists and Technologists (AARST)

- AARST Member ID: A5682
- Member since: May 10, 2017
- AARST Advanced Radon Measurement/Mitigation Professional **(ARP)**

Business Links

- Protect Environmental, LLC Website

Kentucky

State Radon Office Contact

Clay Hardwick

Clay.hardwick@ky.gov

(502) 564-4856

Radon Office Website

Interested in becoming a Member of AARST?

Interested in becoming NRPP certified ?

Radon Levels in your state

Last updated on: August 13, 2021

Jimmy Rogers
Protect Environmental

Certified for Radon Measurement

- Certified by the National Radon Proficiency Program **(NRPP)**
- NRPP Certification **#111911-RT**
- Certified since: March 1, 2021
- Certification Expires: March 31, 2023

Total NRPP Training/Education Credits: 16

Business Links

- Protect Environmental Website

Kentucky

State Radon Office Contact

Clay Hardwick

Clay.hardwick@ky.gov

(502) 564-4856

Radon Office Website

Interested in becoming a Member of AARST?

Interested in becoming NRPP certified ?

Appendix F

EPA Radon Zone Map

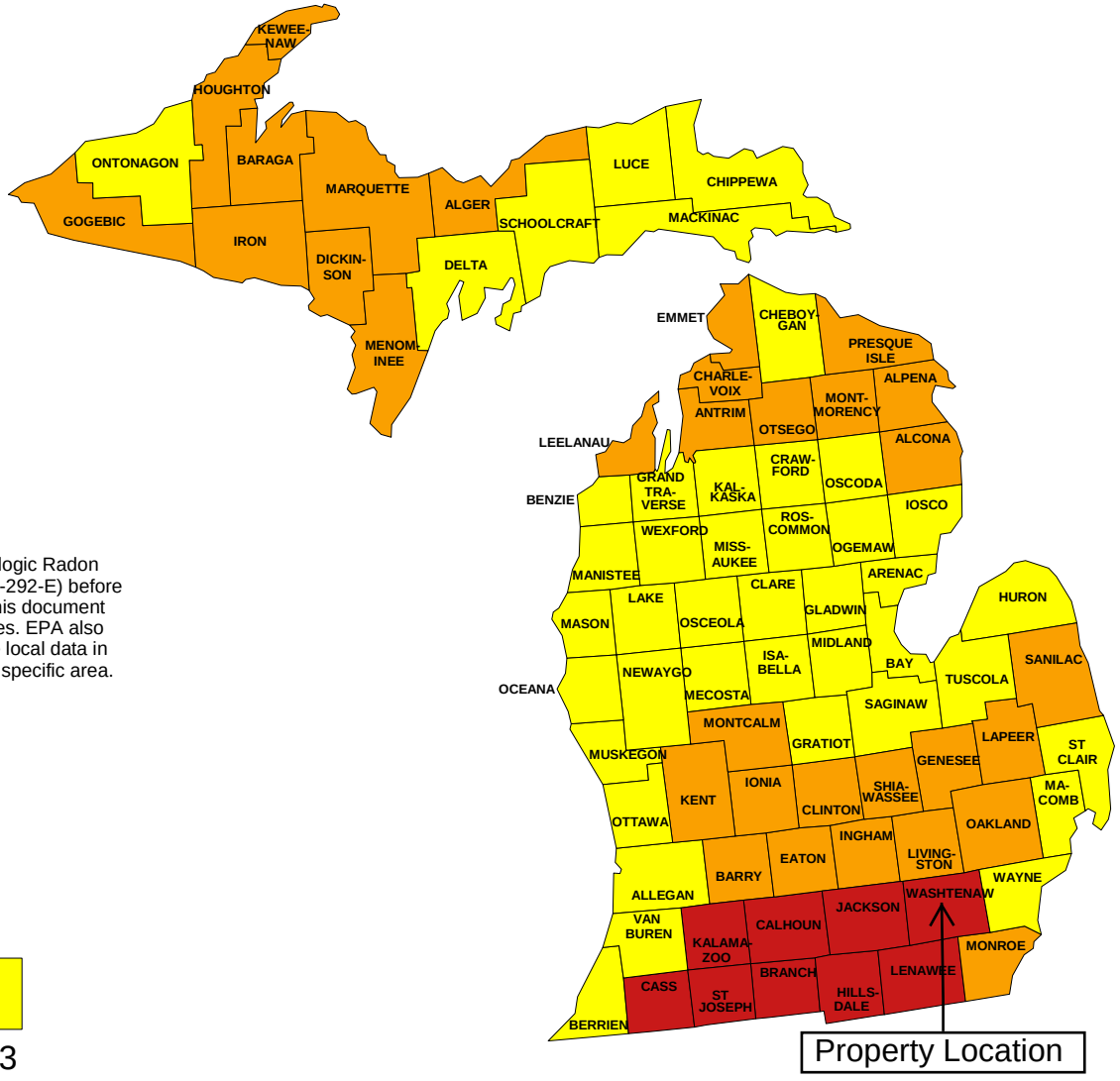
MICHIGAN - EPA Map of Radon Zones

http://www.epa.gov/radon/zonemap.html

The purpose of this map is to assist National, State and local organizations to target their resources and to implement radon-resistant building codes.

This map is not intended to determine if a home in a given zone should be tested for radon. Homes with elevated levels of radon have been found in all three zones.

All homes should be tested, regardless of zone designation.



IMPORTANT: Consult the publication entitled "Preliminary Geologic Radon Potential Assessment of Michigan" (USGS Open-file Report 93-292-E) before using this map. http://energy.cr.usgs.gov/radon/grpinfo.html This document contains information on radon potential variations within counties. EPA also recommends that this map be supplemented with any available local data in order to further understand and predict the radon potential of a specific area.

Zone 1 Zone 2 Zone 3

Appendix G

Notification Documentation

Radon Measurement – Resident Notification (ST)

We will be conducting a radon assessment in your community. Your residence may be selected for placement of a measurement device. Access to your residence for purposes of placing and retrieving the measurement device may be necessary on the following dates:

Device Placement: **08/16/2022 and 08/17/2022**

Device Retrieval: **08/18/2022 and 08/19/2022**

During the measurement period, regardless of whether a measurement device is placed in your residence, you are required to maintain the following conditions to ensure a valid measurement:

- All windows must be kept closed. All exterior doors must be kept closed, except for normal entry and exit. **Windows and doors must be kept closed for a period of 12 hours prior to the device placement date and remain closed effect until the devices are retrieved.**

- Whole house fans must not be operated. Window air conditioning units may only be operated in recirculation mode. Portable window fans must be removed from the window or sealed in place.

- Fireplaces or combustion appliances, other than water heaters and cooking appliances, must not be operated unless they are your primary heat source.

- Ceiling fans, portable air filters, portable de-humidifiers, portable humidifiers or window air conditioning units operating in recirculation mode must not be operated within 20’ of the measurement device.

- If a device is placed in your unit, the measurement device must not be touched, tampered with, covered, removed, or altered, and the location of the device must not be changed. Your HVAC system must be operated in the normal range – your thermostat should not be adjusted drastically, and your fan should be set in normal mode.

The technician placing and retrieving the devices is required to report any failure to maintain closed-building conditions. Failure to maintain these conditions could result in an invalid measurement and require the measurement to be repeated.

Your assistance in helping to ensure a valid measurement in greatly appreciated! Contact your management office with questions regarding this notification.

Thank you.

Radon Measurement – Responsible Party Notification (ST)

Date: July 27, 2022
Measurement Location: River Run LDHA 2000 South Industrial Ann Arbor, MI
Measurement Period: 08/16/2022 through 08/19/2022

During the measurement period, the following conditions must be maintained in each residence (regardless of whether or not the unit contains a measurement device) and all common areas in the building to ensure a valid measurement:

- All windows must be kept closed. All exterior doors must be kept closed, except for normal entry and exit. **Windows and doors must be kept closed for a minimum period of 12 hours prior to device placement and remain closed until device retrieval.**

- Whole house fans must not be operated. Window air conditioning units may only be operated in recirculation mode. Portable window fans must be removed from the window or sealed in place.

- Fireplaces or combustion appliances, other than water heaters and cooking appliances, must not be operated unless they are the primary heat source.

- Ceiling fans, portable air filters, portable de-humidifiers, portable humidifiers or window air conditioning units operating in recirculation mode must not be operated within 20' measurement devices.

- The measurement device must not be touched, tampered with, covered, removed or altered, and the location of the device must not be changed. HVAC systems must be operated in the normal range – thermostats should not be adjusted drastically and air handlers should be set in normal mode.

- Unusual occurrences that could affect the measurement, such as power outages or extreme weather conditions, must be reported to Protect Environmental.

The technician placing and retrieving the devices is required to report any failure to maintain measurement conditions. Failure to maintain measurement conditions may result in an invalid measurement and require the measurement to be repeated.

As the responsible party for the measurement location listed above, I hereby acknowledge receipt of this Measurement Conditions Notification and agree to make reasonable efforts to ensure the conditions outlined herein are maintained throughout the measurement period.

Beth Garoch

Responsible Party