



## Radon Measurement Assessment Report

Prepared for:

**Ann Arbor Housing Commission  
727 Miller Avenue  
Ann Arbor, MI 48103**

Project location:

**Maple Tower LDHA – Maple Meadows  
800-890 South Maple Road  
Ann Arbor, MI 48103**

PE Project Number:

**MI22-705**

Prepared by:

**Protect Environmental  
9822 Bluegrass Parkway  
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Phone: 502-410-5000  
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Report Date:

**August 23, 2022**

Prepared by:

Keith Hoylman  
Protect Environmental

Preparation Date: August 23, 2022

This assessment report was developed specifically for the radon measurement conducted at Maple Tower LDHA – Maple Meadows, 800-890 South Maple Road, Ann Arbor, MI 48103. 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](mailto:Jennifer@ProtectEnv.com).



Keith Hoylman  
Radon Professional  
NRPP Certification Number: RMT-109309

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## 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](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 Maple Tower LDHA – Maple Meadows, 800-890 South Maple Road, Ann Arbor, MI 48103. 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 18, 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 measurement result for quality assurance purposes in 1 location was invalid. 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
10070902	2022-08-16	10:00 am	2022-08-18	9:00 am	70	MAPLE TOWER LDHA-MAPLE MEADOWS	800-810 S MAPLE RD	810		1	1.4
10070903	2022-08-16	9:00 am	2022-08-18	9:00 am	70	MAPLE TOWER LDHA-MAPLE MEADOWS	880-890 S MAPLE RD	OFFICE		1	3.2
10070905	2022-08-16	9:00 am	2022-08-18	9:00 am	70	MAPLE TOWER LDHA-MAPLE MEADOWS	880-890 S MAPLE RD	886		1	< 0.3
10070906	2022-08-16	9:00 am	2022-08-18	9:00 am	70	MAPLE TOWER LDHA-MAPLE MEADOWS	880-890 S MAPLE RD	882		1	1.9
10070907	2022-08-16	9:00 am	2022-08-18	9:00 am	70	MAPLE TOWER LDHA-MAPLE MEADOWS	880-890 S MAPLE RD	884		1	1.9
10070908	2022-08-16	9:00 am	2022-08-18	9:00 am	70	MAPLE TOWER LDHA-MAPLE MEADOWS	880-890 S MAPLE RD	884		1	2.1
10070909	2022-08-16	9:00 am	2022-08-18	9:00 am	70	MAPLE TOWER LDHA-MAPLE MEADOWS	880-890 S MAPLE RD	888		1	1.1
10070910	2022-08-16	9:00 am	2022-08-18	9:00 am	70	MAPLE TOWER LDHA-MAPLE MEADOWS	880-890 S MAPLE RD	890		1	1.2
10070911	2022-08-16	9:00 am	2022-08-18	9:00 am	70	MAPLE TOWER LDHA-MAPLE MEADOWS	860-870 S MAPLE RD	860		1	2.4
10070912	2022-08-16	9:00 am	2022-08-18	9:00 am	70	MAPLE TOWER LDHA-MAPLE MEADOWS	840-850 S MAPLE RD	846		1	0.6
10070913	2022-08-16	10:00 am	2022-08-18	9:00 am	70	MAPLE TOWER LDHA-MAPLE MEADOWS	820-830 S MAPLE RD	824		1	1.3
10070914	2022-08-16	10:00 am	2022-08-18	9:00 am	70	MAPLE TOWER LDHA-MAPLE MEADOWS	820-830 S MAPLE RD	826		1	1.2
10070915	2022-08-16	10:00 am	2022-08-18	9:00 am	70	MAPLE TOWER LDHA-MAPLE MEADOWS	820-830 S MAPLE RD	820		1	0.8
10070917	2022-08-16	9:00 am	2022-08-18	9:00 am	70	MAPLE TOWER LDHA-MAPLE MEADOWS	860-870 S MAPLE RD	862		1	1.1
10070918	2022-08-16	9:00 am	2022-08-18	9:00 am	70	MAPLE TOWER LDHA-MAPLE MEADOWS	860-870 S MAPLE RD	864		1	0.6
10070919	2022-08-16	9:00 am	2022-08-18	9:00 am	70	MAPLE TOWER LDHA-MAPLE MEADOWS	860-870 S MAPLE RD	866		1	0.8
10070920	2022-08-16	9:00 am	2022-08-18	9:00 am	70	MAPLE TOWER LDHA-MAPLE MEADOWS	860-870 S MAPLE RD	868		1	0.9
10070921	2022-08-16	9:00 am	2022-08-18	9:00 am	70	MAPLE TOWER LDHA-MAPLE MEADOWS	840-850 S MAPLE RD	844		1	0.7
10070922	2022-08-16	9:00 am	2022-08-18	9:00 am	70	MAPLE TOWER LDHA-MAPLE MEADOWS	860-870 S MAPLE RD	870		1	1.9
10070923	2022-08-16	9:00 am	2022-08-18	9:00 am	70	MAPLE TOWER LDHA-MAPLE MEADOWS	840-850 S MAPLE RD	840		1	0.7
10070924	2022-08-16	9:00 am	2022-08-18	9:00 am	70	MAPLE TOWER LDHA-MAPLE MEADOWS	840-850 S MAPLE RD	842		1	0.7
10070925	2022-08-16	9:00 am	2022-08-18	9:00 am	70	MAPLE TOWER LDHA-MAPLE MEADOWS	840-850 S MAPLE RD	848		1	0.9
10070926	2022-08-16	10:00 am	2022-08-18	9:00 am	70	MAPLE TOWER LDHA-MAPLE MEADOWS	820-830 S MAPLE RD	820		1	0.7
10070927	2022-08-16	10:00 am	2022-08-18	9:00 am	70	MAPLE TOWER LDHA-MAPLE MEADOWS	820-830 S MAPLE RD	826		1	1.2
10070928	2022-08-16	10:00 am	2022-08-18	9:00 am	70	MAPLE TOWER LDHA-MAPLE MEADOWS	820-830 S MAPLE RD	822		1	1.2
10070929	2022-08-16	10:00 am	2022-08-18	9:00 am	70	MAPLE TOWER LDHA-MAPLE MEADOWS	840-850 S MAPLE RD	850		1	1.7
10070930	2022-08-16	10:00 am	2022-08-18	9:00 am	70	MAPLE TOWER LDHA-MAPLE MEADOWS	820-830 S MAPLE RD	828		1	1.0
10070933	2022-08-16	10:00 am	2022-08-18	9:00 am	70	MAPLE TOWER LDHA-MAPLE MEADOWS	800-810 S MAPLE RD	802		1	1.9
10070935	2022-08-16	10:00 am	2022-08-18	9:00 am	70	MAPLE TOWER LDHA-MAPLE MEADOWS	800-810 S MAPLE RD	804		1	1.2
10070936	2022-08-16	10:00 am	2022-08-18	9:00 am	70	MAPLE TOWER LDHA-MAPLE MEADOWS	800-810 S MAPLE RD	808		1	0.6
10070937	2022-08-16	10:00 am	2022-08-18	9:00 am	70	MAPLE TOWER LDHA-MAPLE MEADOWS	800-810 S MAPLE RD	800		1	2.5
10070938	2022-08-16	10:00 am	2022-08-18	9:00 am	70	MAPLE TOWER LDHA-MAPLE MEADOWS	820-830 S MAPLE RD	830		1	2.1
11202454	2022-08-16	10:00 am	2022-08-18	9:00 am	70	MAPLE TOWER LDHA-MAPLE MEADOWS	820-830 S MAPLE RD	822		1	< 0.3

## **Appendix B**

### Device Placement Log

## Device Placement Log

Facility:	Maple Tower LDHA-Maple Meadows				RES Devices:	29	Placement Arrival:	9:00 AM		
Address:	800-890 South Maple Road, Ann Arbor, MI 48103				NR Devices:	1	Placement Departure:	10:00 AM		
Contact:	Tim Olivier: 734-794-6720				Duplicate Devices:	3	Retrieval Arrival:	9:00 AM		
Placement Day/Type/Pro:	8/16/2022	ST	Jimmy Rogers		Blank Devices:	2	Retrieval Departure:	9:00 AM		
Retrieval Day/Type/Pro:	8/18/2022	ST	Jimmy Rogers		Total Devices:	35	Ship Info:	FedEx: 1-Day		
Standard:	MAMF 2017	Project Type:	HUD, Initial 100%		Shipped Devices:	34	Ship Date:	8/18/2022		
Kit Number	Start Date	Start Time	End Date	End Time	Temp	Building	Room	Floor	Vacant	Notes
10070903	8/16/2022	9:00 AM	8/18/2022	9:00 AM	70	880-890 S Maple Rd	Office	1		
11202453	8/16/2022	9:00 AM	8/18/2022	9:00 AM	70	880-890 S Maple Rd	Office FIELD BLANK	1		DNA: Lab Error
10070906	8/16/2022	9:00 AM	8/18/2022	9:00 AM	70	880-890 S Maple Rd	882	1		
10070907	8/16/2022	9:00 AM	8/18/2022	9:00 AM	70	880-890 S Maple Rd	884	1		
10070908	8/16/2022	9:00 AM	8/18/2022	9:00 AM	70	880-890 S Maple Rd	884 DUPLICATE	1		
10070905	8/16/2022	9:00 AM	8/18/2022	9:00 AM	70	880-890 S Maple Rd	886	1		
10070909	8/16/2022	9:00 AM	8/18/2022	9:00 AM	70	880-890 S Maple Rd	888	1		
10070910	8/16/2022	9:00 AM	8/18/2022	9:00 AM	70	880-890 S Maple Rd	890	1		
10070937	8/16/2022	10:00 AM	8/18/2022	9:00 AM	70	800-810 S Maple Rd	800	1		
10070933	8/16/2022	10:00 AM	8/18/2022	9:00 AM	70	800-810 S Maple Rd	802	1		

### Device Placement Log

10070935	8/16/2022	10:00 AM	8/18/2022	9:00 AM	70	800-810 S Maple Rd	804	1		
NA	NA	NA	NA	NA	NA	800-810 S Maple Rd	806	1		DNP: Access
10070936	8/16/2022	10:00 AM	8/18/2022	9:00 AM	70	800-810 S Maple Rd	808	1		
10070902	8/16/2022	10:00 AM	8/18/2022	9:00 AM	70	800-810 S Maple Rd	810	1		
10070926	8/16/2022	10:00 AM	8/18/2022	9:00 AM	70	820-830 S Maple Rd	820	1		
10070915	8/16/2022	10:00 AM	8/18/2022	9:00 AM	70	820-830 S Maple Rd	820 DUPLICATE	1		
10070928	8/16/2022	10:00 AM	8/18/2022	9:00 AM	70	820-830 S Maple Rd	822	1		
11202454	8/16/2022	10:00 AM	8/18/2022	9:00 AM	70	820-830 S Maple Rd	822 FIELD BLANK	1		
10070913	8/16/2022	10:00 AM	8/18/2022	9:00 AM	70	820-830 S Maple Rd	824	1		
10070927	8/16/2022	10:00 AM	8/18/2022	9:00 AM	70	820-830 S Maple Rd	826	1		
10070914	8/16/2022	10:00 AM	8/18/2022	9:00 AM	70	820-830 S Maple Rd	826 DUPLICATE	1		
10070930	8/16/2022	10:00 AM	8/18/2022	9:00 AM	70	820-830 S Maple Rd	828	1		
10070938	8/16/2022	10:00 AM	8/18/2022	9:00 AM	70	820-830 S Maple Rd	830	1	X	

### Device Placement Log

10070923	8/16/2022	9:00 AM	8/18/2022	9:00 AM	70	840-850 S Maple Rd	840	1		
10070924	8/16/2022	9:00 AM	8/18/2022	9:00 AM	70	840-850 S Maple Rd	842	1		
10070921	8/16/2022	9:00 AM	8/18/2022	9:00 AM	70	840-850 S Maple Rd	844	1		
10070912	8/16/2022	9:00 AM	8/18/2022	9:00 AM	70	840-850 S Maple Rd	846	1		
10070925	8/16/2022	9:00 AM	8/18/2022	9:00 AM	70	840-850 S Maple Rd	848	1		
10070929	8/16/2022	10:00 AM	8/18/2022	9:00 AM	70	840-850 S Maple Rd	850	1		
10070911	8/16/2022	9:00 AM	8/18/2022	9:00 AM	70	860-870 S Maple Rd	860	1		
10070917	8/16/2022	9:00 AM	8/18/2022	9:00 AM	70	860-870 S Maple Rd	862	1		
10070918	8/16/2022	9:00 AM	8/18/2022	9:00 AM	70	860-870 S Maple Rd	864	1		
10070919	8/16/2022	9:00 AM	8/18/2022	9:00 AM	70	860-870 S Maple Rd	866	1	X	
10070920	8/16/2022	9:00 AM	8/18/2022	9:00 AM	70	860-870 S Maple Rd	868	1		
10070922	8/16/2022	9:00 AM	8/18/2022	9:00 AM	70	860-870 S Maple Rd	870	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
880-890 S Maple Rd, Unit 884	8/16/2022 to 8/18/2022	10070907	1.9	2.0	10.0%	Duplicate
		10070908	2.1			
820-830 S Maple Rd, Unit 820	8/16/2022 to 8/18/2022	10070915	0.8	0.8	NA	Duplicate
		10070926	0.7			
820-830 S Maple Rd, Unit 826	8/16/2022 to 8/18/2022	10070914	1.2	1.2	NA	Duplicate
		10070927	1.2			

880-890 S Maple Rd, Office	8/16/2022 to 8/18/2022	11202453	DNA: Invalid		NA	Field Blank
820-830 S Maple Rd, Unit 822	8/16/2022 to 8/18/2022	11202454	< 0.3		NA	Field Blank

# PROTECT<sup>™</sup>

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

# PROTECT<sup>TM</sup>

ENVIRONMENTAL

PE Job Number: 22.17

Device Range: 10070601-10073100

Chamber Info		Storage Info	
Job Number:	206024	Radon Levels:	-
Start Date:	7/1/2022	Device Numbers:	-
Stop Date:	7/5/2022	Start/Stop Date:	-
Temperature:	69.3° F	Temperature:	70-75° F
Rel. Hum:	50.40%	Rel. Hum:	30-45%

### Spikes

Device	Type	Manufacture	Range	Chamber	MV	TV	IRE
10070601	AC	Air Chek	10070601-10073100	Bowser-Morner	8.8	10.4	-15.4%
10070901	AC	Air Chek	10070601-10073100	Bowser-Morner	9.3	10.4	-10.6%
10071001	AC	Air Chek	10070601-10073100	Bowser-Morner	8.7	10.4	-16.3%
10071201	AC	Air Chek	10070601-10073100	Bowser-Morner	9.2	10.4	-11.5%
10071501	AC	Air Chek	10070601-10073100	Bowser-Morner	9.0	10.4	-13.5%
10071601	AC	Air Chek	10070601-10073100	Bowser-Morner	9.3	10.4	-10.6%
10071801	AC	Air Chek	10070601-10073100	Bowser-Morner	8.2	10.4	-21.2%
10072101	AC	Air Chek	10070601-10073100	Bowser-Morner	9.9	10.4	-4.8%
10072201	AC	Air Chek	10070601-10073100	Bowser-Morner	9.9	10.4	-4.8%
10072501	AC	Air Chek	10070601-10073100	Bowser-Morner	9.0	10.4	-13.5%
10072701	AC	Air Chek	10070601-10073100	Bowser-Morner	8.5	10.4	-18.3%
10073001	AC	Air Chek	10070601-10073100	Bowser-Morner	9.7	10.4	-6.7%

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
10070801	AC	Air Chek	10070601-10073100	Bowser-Morner	< 0.3	< 0.3	YES
10071301	AC	Air Chek	10070601-10073100	Bowser-Morner	< 0.3	< 0.3	YES
10071701	AC	Air Chek	10070601-10073100	Bowser-Morner	< 0.3	< 0.3	YES
10072001	AC	Air Chek	10070601-10073100	Bowser-Morner	< 0.3	< 0.3	YES
10072401	AC	Air Chek	10070601-10073100	Bowser-Morner	< 0.3	< 0.3	YES
10072801	AC	Air Chek	10070601-10073100	Bowser-Morner	< 0.3	< 0.3	YES

*Winnie Chevront*

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Winnie Chevront  
QA Coordinator

*Kyle Hoyleman*

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Kyle Hoyleman  
QA Manager

## **Appendix D**

### Measurement Event Weather Conditions



## Weather Summary

Facility: Maple Tower LDHA-Maple Meadows

Address: 800-890 South Maple Road, Ann Arbor, MI 48103

Placement Day: 8/16/2022

Retrieval Day: 8/18/2022

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
Overall Avg.	62	82	72	0	0.02	0	0	0	0	0	14	7	41	87	64

## **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**)



### Kentucky

State Radon Office Contact

Clay Hardwick

Clay.hardwick@ky.gov

(502) 564-4856

Radon Office Website

### American Association of Radon Scientists and Technologists (AARST)

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

Interested in becoming a Member of AARST?

### Business Links

- [Protect Environmental, LLC Website](#)

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**



### *Kentucky*

*State Radon Office Contact*

Clay Hardwick

Clay.hardwick@ky.gov

(502) 564-4856

Radon Office Website

### Business Links

- [Protect Environmental Website](#)

Interested in becoming a Member of  
AARST?

Interested in becoming NRPP certified ?

## **Appendix F**

### EPA Radon Zone Map

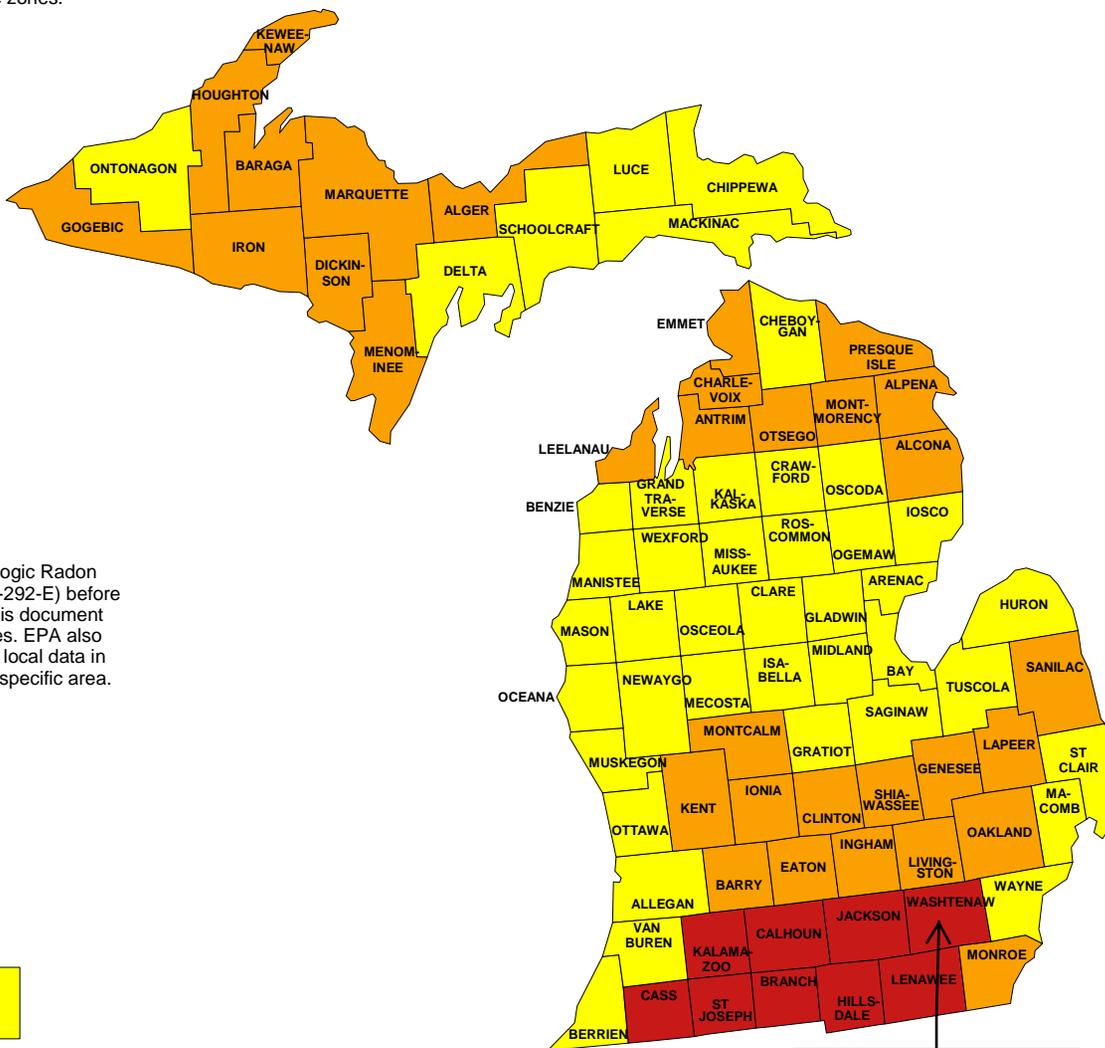
# MICHIGAN - EPA Map of Radon Zones

<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.**



Zone 1



Zone 2



Zone 3

Property Location

**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.

## **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**

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

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 is 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: Maple Tower 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 Garock*

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Responsible Party