



Cascade Radon, Inc.
Testing, Mitigation,
Systems Design
CCB 180537 / CASCARI927C1
Fed ID 26-1809992

12839 NE Airport Way Bldg. 9
Portland, Oregon 97230
Phone: (503) 421-4813
Fax: (503) 281-6170
Office@CascadeRadon.com

Meek High School

(C-65190)

4039 NE Alberta Court, Portland, OR 97211

March 2, 2018



Cascade Radon, Inc.
Testing, Mitigation,
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CCB 180537 / CASCARI927C1
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Purpose

Initial testing was performed March 8, 2016 to March 11, 2016 by PBS Engineering and Environmental Inc. Testing indicated 4.2 pCi/L in room 103 and 5.3 pCi/L in room 107 of the building. PBS performed additional testing starting in October 2016 to April 2017 as a confirmation long-term test to determine if mitigation was needed. The result of this 6 month test was 4.0 pCi/L in room 103 and 3.9 pCi/L in room 107. Cascade Radon was hired to diagnose rooms 103 and 107 and develop a mitigation strategy to reduce the radon levels.

The installation of a sub-slab depressurization system was used to reduce the radon below the EPA action level of 4 pCi/L. See attached pages for a description of the system components and post-mitigation testing.



The suction point is located in a storage room 101B adjacent to classroom 103. The vent piping continues to the fan location on the roof above. The system includes a manometer (pressure gauge), which is a simple means of seeing the system is working mechanically. A manometer also shows how much negative pressure (depressurization) the system is creating. It is understood such a pressure gauge DOES NOT monitor radon levels.



This system was designed with a Festa AMG Fury model fan. This fan is utilized when there is porous soil beneath the concrete slab. For secure and durable mounting, a strut channel stand was constructed to support the mitigation fan and electrical components.

Credentials

Cascade Radon, Inc.
12839 NE Airport Way Bldg. 9
Portland, OR 97230
(503)421-4813
office@cascaderadon.com
CCB180537
CASCARI977C1
NEHA/NRPP# 104815RMT
NRSB# 1G0008

Snyder Roofing of Oregon LLC
12650 SW Hall Blvd.
Tigard, OR 97223
(503)620-5252
Snyder-builds.com
CCB135987

Christensen Electric, Inc.
17201 NE Sacramento Street
Portland, OR 97230
(503)419-3300
info@christenson.com
CCB458



CASCADE RADON, INC.

Testing, Mitigation,
Systems Design
CCB 180537 / CASCARI927C1

12839 NE Airport Way
Portland, OR 97230
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Fax: (503) 281-6170
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March 2, 2018
C-65190

To: Portland Public Schools
501 N. Dixon Street
Portland, OR 97227

RE: Meek High School
4039 NE Alberta Court
Portland, OR 97217

Effective: January 22, 2018

Cascade Radon, Inc. warrants that all work has been performed in a workmanlike manner and according to the best standard practices. All materials and equipment are new, unless otherwise specified, and of first quality.

Cascade Radon, Inc. guarantees that the installation will maintain average, long-term, indoor radon levels, based upon approved 9 month duration Alpha-Track testing at or below 4 pCi/L for a period of 10 years.

With the exception of the exhaust fan unit(s), Cascade Radon, Inc. warrants that all labor, work, materials and equipment will be free from faults in material or workmanship for period of ten (10) years from the date of substantial completion.

Includes 5-year manufactures replacement warranty on exhaust fan unit(s), beginning at time of initial activation, with any related work and materials provided at no cost to the Client.

All warranties and guarantees are transferable to future owners of the same property.

Warranty or service inquires, please call (503) 421-4813

Sincerely,
Wade Gervais
Division Manager
Cascade Radon, Inc.



TEST DETAILS:

Meek High School
 4039 NE Alberta Ct
 Portland, OR 97211

Portland Public Schools

Multnomah

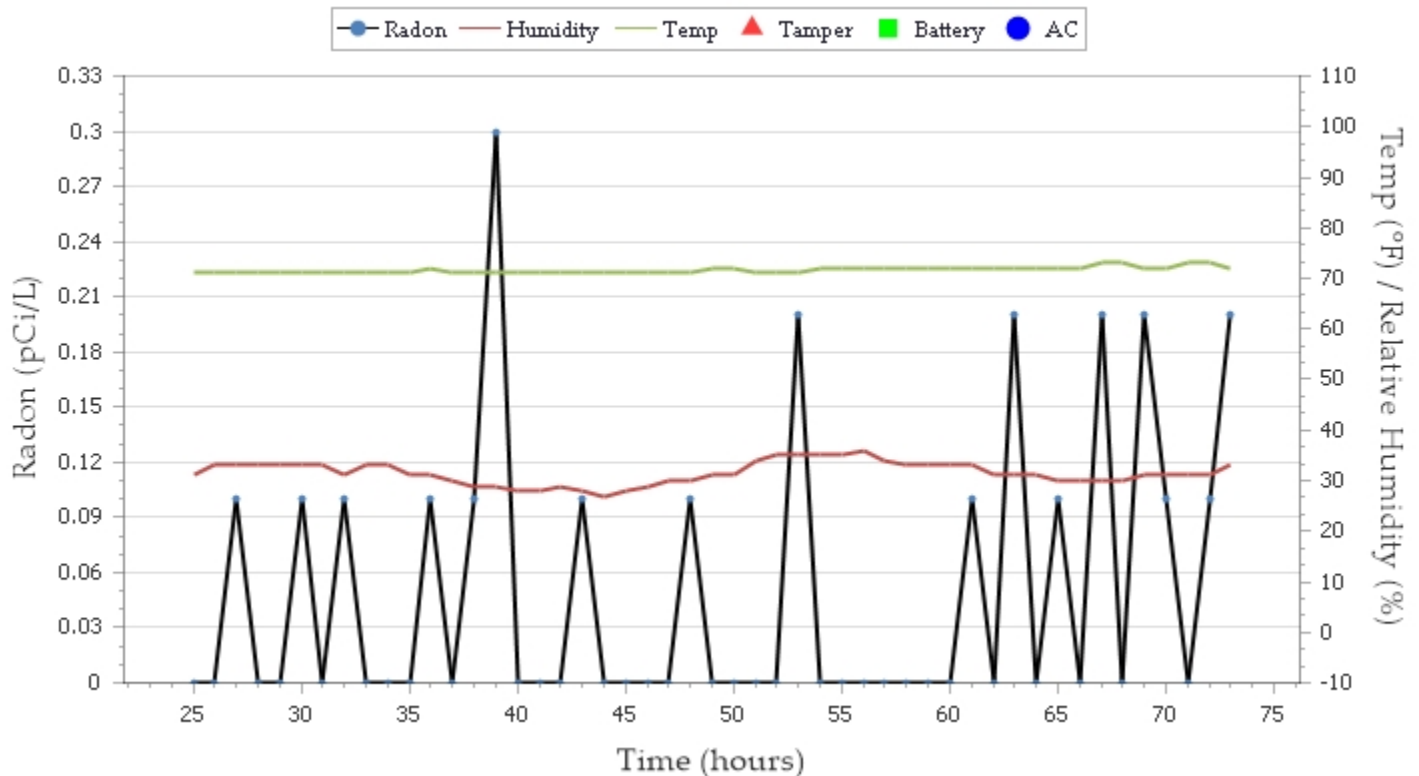
Test Start Date/Time: Friday, January 19, 2018 // 8:09 AM
Test End Date/Time: Monday, January 22, 2018 // 9:38 AM
Location of Instrument: Room 103 South Wall

Notes:

TEST RESULTS:

Average: 0.0 pCi/L

Test ID# 80041



Tamara C Linde

1/26/18

Tamara Linde
 Certification #:
 License 1:
 License 2:

Date
 CCB 180537/ CASCARI927C1
 NRPP 108946RT, 108953RT



INTERVAL REPORT:

Hour	T	B	AC	pCi/L	Temp	Humd	Alpha
25				0.0	71	31	0
26				0.0	71	33	0
27				0.1	71	33	4
28				0.0	71	33	0
29				0.0	71	33	0
30				0.1	71	33	4
31				0.0	71	33	2
32				0.1	71	31	5
33				0.0	71	33	0
34				0.0	71	33	0
35				0.0	71	31	1
36				0.1	72	31	4
37				0.0	71	30	3
38				0.1	71	29	4
39				0.3	71	29	11
40				0.0	71	28	0
41				0.0	71	28	0
42				0.0	71	29	2
43				0.1	71	28	4
44				0.0	71	27	0
45				0.0	71	28	0
46				0.0	71	29	1
47				0.0	71	30	1
48				0.1	71	30	4
49				0.0	72	31	0
50				0.0	72	31	3
51				0.0	71	34	1
52				0.0	71	35	0
53				0.2	71	35	8
54				0.0	72	35	3
55				0.0	72	35	1
56				0.0	72	36	0
57				0.0	72	34	0
58				0.0	72	33	0
59				0.0	72	33	0
60				0.0	72	33	0
61				0.1	72	33	4
62				0.0	72	31	0
63				0.2	72	31	7
64				0.0	72	31	0
65				0.1	72	30	4
66				0.0	72	30	2
67				0.2	73	30	9
68				0.0	73	30	0
69				0.2	72	31	9
70				0.1	72	31	4
71				0.0	73	31	0
72				0.1	73	31	4
73				0.2	72	33	9

Minimum: 0.0 pCi/L **Maximum:** 0.3 pCi/L **Average:** 0.0 pCi/L

Tamara C Linde 1/26/18
 Tamara Linde Date
 Certification #:
 License 1: CCB 180537/ CASCARI927C1

Tamara Linde
Cascade Radon
12839 NE Airport Way
Portland, OR 97230
Phone: 503-421-4813
office@cascaderadon.com

Fax: 503-281-6170



License 2:

NRPP 108946RT, 108953RT



**CERTIFICATE OF CALIBRATION
RadStar RS800 Continuous Monitor**

This instrument has been calibrated in accordance with the procedures set forth by the manufacturer.
Please retain this certificate for your records

Cal Date: 5-12-17 Last Cal Date: _____ Next Cal Date: 5-12-18
Device Serial Number: 2394 Device Type: RS800
Device Status: Passed Failed Radon Chamber: TC 103 B

NRPP Chamber#TC103	Radon Gas Concentration:	<u>16.6 pCi/l</u>
CRM Serial Numbers:	<u>4183 2173 2178</u>	
Chamber Temperature:	<u>69.0 °F</u>	Chamber Humidity: <u>31.7 %RH</u>
Start Chamber Exposure:	<u>02/09/17 11:00</u>	Stop Chamber Exposure: <u>02/13/17 08:00</u>

Calibration Number (as found, if applicable) _____ *Calib#=(10240/(Hourly Counts/pCi/l))*
Calibration Number (Final) 327 Calibrated By: [Signature]

RadonAway 3 Saber Way Ward Hill, Massachusetts 01835 978-521-3703

This RadStar Continuous Radon Monitor has been calibrated by the Manufacturer using a standard operating procedure for the calibration of the RS800, TP010 Rev E. This procedure provides for the following performance checks:

- System Functional Checks
- Battery Check
- Back Ground Check in Nitrogen 0.1 pCi/l 6 cph
- Chamber Exposure in known Radon Gas Concentration
- Adjustment to Calibration Number, if necessary
- Adjustment to Background, if necessary
- Verification Chamber Exposure, if necessary

(As Tested Background is Integrated into Instrument Calculation Program. Do Not Adjust Readings by Background)

The manufacturer, RadonAway performs quarterly inter-comparisons with a Secondary Chamber

NRPP Device Code 476 Device group 18 USEPA Verified

Radon Measurement Specialist:

NRSB #6SS0002, NRPP #100842RT

The RadStar RS800 is distributed by Accustar Labs 888-580-9596



TEST DETAILS:

Meek High School
 4039 NE Alberta Ct
 Portland, OR 97211
 Multnomah

Portland Public Schools

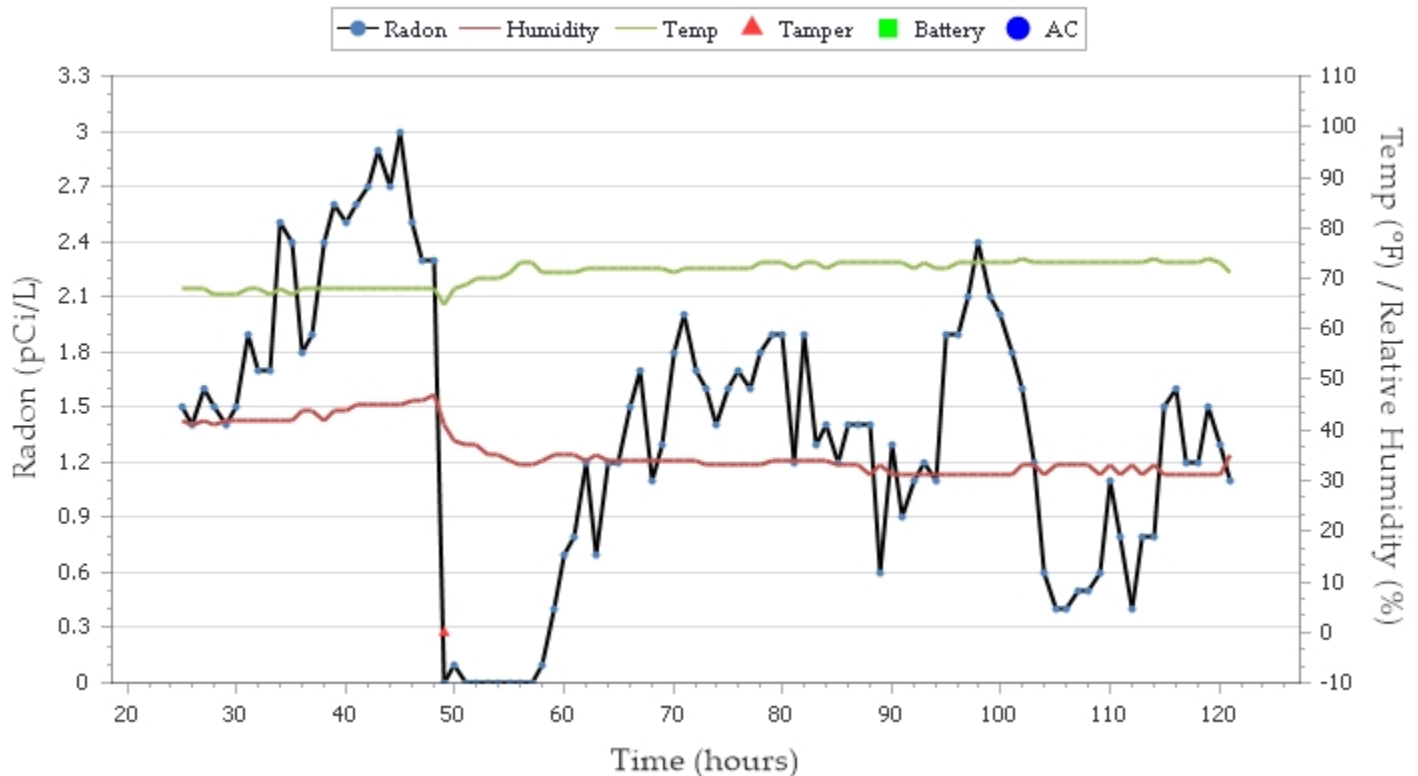
Test Start Date/Time: Friday, January 19, 2018 // 8:05 AM
Test End Date/Time: Monday, January 22, 2018 // 9:35 AM
Location of Instrument: Room 107 East Wall

Notes:

TEST RESULTS:

Average: 1.3 pCi/L

Test ID# 80383



Tamara C Linde

1/26/18

Tamara Linde

Date

Certification #:

License 1:

CCB 180537/ CASCARI927C1

License 2:

NRPP 108946RT, 108953RT



INTERVAL REPORT:

Hour	T	B	AC	pCi/L	Temp	Humd	Alpha
25				1.5	68	42	49
26				1.4	68	41	44
27				1.6	68	42	50
28				1.5	67	41	49
29				1.4	67	42	45
30				1.5	67	42	48
31				1.9	68	42	61
32				1.7	68	42	53
33				1.7	67	42	55
34				2.5	68	42	77
35				2.4	67	42	75
36				1.8	68	44	58
37				1.9	68	44	60
38				2.4	68	42	74
39				2.6	68	44	81
40				2.5	68	44	77
41				2.6	68	45	83
42				2.7	68	45	84
43				2.9	68	45	91
44				2.7	68	45	84
45				3.0	68	45	93
46				2.5	68	46	77
47				2.3	68	46	71
48				2.3	68	47	72
49	*			0.0	65	41	1
50				0.1	68	38	5
51				0.0	69	37	0
52				0.0	70	37	0
53				0.0	70	35	2
54				0.0	70	35	0
55				0.0	71	34	0
56				0.0	73	33	3
57				0.0	73	33	1
58				0.1	71	34	4
59				0.4	71	35	15
60				0.7	71	35	22
61				0.8	71	35	25
62				1.2	72	34	37
63				0.7	72	35	22
64				1.2	72	34	39
65				1.2	72	34	37
66				1.5	72	34	49
67				1.7	72	34	53
68				1.1	72	34	36
69				1.3	72	34	43
70				1.8	71	34	58
71				2.0	72	34	63
72				1.7	72	34	53
73				1.6	72	33	52
74				1.4	72	33	46
75				1.6	72	33	52
76				1.7	72	33	54
77				1.6	72	33	52
78				1.8	73	33	57
79				1.9	73	34	61
80				1.9	73	34	60
81				1.2	72	34	38



82	1.9	73	34	59
83	1.3	73	34	43
84	1.4	72	34	45
85	1.2	73	33	38
86	1.4	73	33	44
87	1.4	73	33	45
88	1.4	73	31	46
89	0.6	73	33	21
90	1.3	73	31	42
91	0.9	73	31	29
92	1.1	72	31	35
93	1.2	73	31	39
94	1.1	72	31	36
95	1.9	72	31	61
96	1.9	73	31	60
97	2.1	73	31	66
98	2.4	73	31	74
99	2.1	73	31	67
100	2.0	73	31	62
101	1.8	73	31	57
102	1.6	74	33	51
103	1.2	73	33	38
104	0.6	73	31	20
105	0.4	73	33	15
106	0.4	73	33	13
107	0.5	73	33	17
108	0.5	73	33	17
109	0.6	73	31	19
110	1.1	73	33	34
111	0.8	73	31	26
112	0.4	73	33	14
113	0.8	73	31	27
114	0.8	74	33	27
115	1.5	73	31	47
116	1.6	73	31	52
117	1.2	73	31	38
118	1.2	73	31	39
119	1.5	74	31	49
120	1.3	73	31	43
121	1.1	71	35	35

Minimum: 0.0 pCi/L **Maximum:** 3.0 pCi/L **Average:** 1.3 pCi/L

Tamara C Linde 1/26/18
 Tamara Linde Date
 Certification #:
 License 1: CCB 180537/ CASCARI927C1
 License 2: NRPP 108946RT, 108953RT



**CERTIFICATE OF CALIBRATION
RadStar RS800 Continuous Monitor**

This instrument has been calibrated in accordance with the procedures set forth by the manufacturer.
Please retain this certificate for your records

Cal Date: 10-20-17 Last Cal Date: 10/07/16 Next Cal Date: 10-20-18
Device Serial Number: 1715 Device Type: RS800
Device Status: Passed Failed Radon Chamber: TC 103 B

NRPP Chamber#TC103	Radon Gas Concentration: <u>19.4 pCi/l</u>
CRM Serial Numbers: <u>4183 2173 2178</u>	
Chamber Temperature: <u>70.1 °F</u>	Chamber Humidity: <u>46.6 %RH</u>
Start Chamber Exposure: <u>10/16/17 10:00</u>	Stop Chamber Exposure: <u>10/18/17 08:00</u>

Calibration Number (as found, if applicable) 333 *Calib#=(10240/(Hourly Counts/pCi/l))*
Calibration Number (Final) 333 Calibrated By: [Signature]

RadonAway 3 Saber Way Ward Hill, Massachusetts 01835 978-521-3703

This RadStar Continuous Radon Monitor has been calibrated by the Manufacturer using a standard operating procedure for the calibration of the RS800, TP010 Rev F. This procedure provides for the following performance checks:

- System Functional Checks
- Battery Check
- Back Ground Check in Nitrogen 0.1 pCi/l 17 cph
- Chamber Exposure in known Radon Gas Concentration
- Adjustment to Calibration Number, if necessary
- Adjustment to Background, if necessary
- Verification Chamber Exposure, if necessary

(As Tested Background is Integrated into Instrument Calculation Program, Do Not Adjust Readings by Background)

The manufacturer, RadonAway performs quarterly inter-comparisons with a Secondary Chamber

NRPP Device Code 476 Device group 18 USEPA Verified

Radon Measurement Specialist:

NRSB #6SS0002, NRPP #100842RT

The RadStar RS800 is distributed by Accustar Labs 888-580-9596