

KELSAY

Environmental Consulting

June 22, 2020

Mr. Kevin Strong
Business Manager
Sweet Home School District Office
1920 Long Street
Sweet Home, Oregon 97386

RE: Long-Term Radon Sampling at the Hawthorne Elementary School (DRAFT)

Kelsay Environmental performed a long-term radon survey at Hawthorne Elementary School located at 3205 Long St., Sweet Home, Oregon. Sampling began on November 21, 2019 as a screening for potential Radon concerns in compliance with Oregon Revised Statute (ORS) 332.116-167. *Long-term sampling* is defined by a minimum of 90 days which helps account for normal fluctuations in building conditions over time.

Under ORS 332.166-167, radon testing in Oregon Schools must be performed by January 1st, 2021. The sampling protocol was derived from a document produced by the Oregon Health Authority called “Testing for Elevated Radon in Oregon Schools, A Protocol and Plan”. The screening was performed to determine if radon levels in the building were above the Environmental Protection Agency’s (EPA) action level of 4.0 pCi/L (picocuries per liter). If levels exceed the action level, a remediation process must be enacted to mitigate exposure levels. This survey would be the basis of that remediation plan.

Testing locations included every occupied room on the first floor of the structure. According to ORS 332.166-167, it specifies that “at a minimum, any frequently-occupied room in contact with the ground or located above a basement or crawlspace” should be tested.

Sampling Procedures

Kelsay Environmental conducted sampling for radon gas in all occupied rooms that were bordered by ground or soil. Hawthorne Elementary School consists of a concrete foundation with one floor. Samples were collected using Alpha Track AT-100 diffusion-based track radon monitors from Accustar Labs. A total of 31 rooms were tested (see attached table for locations). In addition, three duplicates, 2 blanks and one spike were submitted to the lab to ensure quality control. A total of 38 detectors kits were used.

Radon detectors were placed in each occupied space, particularly within the height of the normal breathing zone (between 2 and 6 feet in height) on November 21, 2019. The conditions of the building were such that the HVAC system was operating under normal occupancy conditions and the building was occupied as usual on a day-to-day basis. Samples were retrieved on March 27, 2020, providing for 127 total days of sampling, and then submitted to the Accustar Laboratory for analysis, a NELAP accredited lab, using electrochemical etching to process it’s alpha track foils

which are subsequently counted with computer-aided image analysis equipment.

Samples to be spiked for quality control are sent to the Bowser-Morner Radon Reference Laboratory. Samples are exposed to specific concentrations of radon in a radon reference chamber and are then submitted to the Accustar Labs for analysis. The results are compared to the known spike concentration to ensure quality control.

Results and Discussion

Radon gas is generally always present in varying quantities, inside and outside of buildings. According to the EPA, radon gas averages 1.3 pCi/L inside buildings across the country, with 0.4 pCi/L generally considered background level. The background level is also the analytical level of detection for AccuStar Labs, levels below which cannot be accurately measured.

Laboratory results indicate all measured radon gas concentrations were below the action level of 4.0 pCi/L.

Spiked samples were within acceptable parameters for quality assurance based on the Relative Percentage Error (RPE). 6.1 pCi/L is the analytical result for the spikes from Bowser-Morner.

$$((\text{Measured Value} - \text{Reference Value}) / \text{Reference Value}) \times 100\%$$

Duplicate and blank samples were as well within acceptable parameters based on the Relative Percent Difference:

$$((\text{Initial Result} - \text{Duplicate Result}) / \text{Average of Both Results}) \times 100\%$$

TABLE 1
SPIKE/DUPLICATE/BLANK SAMPLE RESULTS
HAWTHORNE ELEMENTARY SCHOOL

Sample No.	Sample Variety	Location	Results (pCi/L)	Relative Percentage Error/Difference	Acceptance
4327144	Spike	NA	6.4	4.91 %	Yes
4326817/ 4326819	Duplicate/Original	Gym	1.0 / 1.2	18.18%	Yes
4326807/ 4326806	Duplicate/Original	Library	1.6 / 1.6	0%	Yes
4326829/ 4326830	Duplicate/Original	Room 14	2.7 / 2.8	3.63%	Yes
4326936	Blank				TBD
4326951	Blank				TBD

*Blanks should be close to 0.00 pCi/L or near the laboratory analytical level of detection

*A trend in RPE values over +/-30 pCi/L should be investigated

*RPD values of >27% should be questioned for results over 4.0 pCi/L

*RPD values of >49% should be questioned for results between 2.0-3.9 pCi/L

June 22, 2020
Mr. Kevin Strong
Long-Term Radon Sampling at Hawthorne Elementary School

Recommendations

Radon levels throughout the structure were all below the EPA Action Level of 4.0 pCi/L and therefore remediation procedures are not required now. Oregon Health Authority (ORS 332.166-167) requires schools to re-test for radon every 10 years regardless of initial testing results or whether mitigation was done.

Sincerely,



Lisa Janik
Industrial Hygienist

Attachments: Long-Term Radon Sampling Table
Lab Results/Chain of Custody
Exposure in Bowser-Morner Radon Chamber

Radon Sampling Table
Hawthorne Elementary School
3205 Long St.
Sweet Home, OR

DEVICE NUMBER	START DATE	STOP DATE	Total Days	LOCATION	RADON pCi/L
4326802	11/21/2019	3/27/2020	127	Office	1.0
4326907	11/21/2019	3/27/2020	127	Main Office	1.0
4326801	11/21/2019	3/27/2020	127	Office	1.0
4326820	11/21/2019	3/27/2020	127	Gym	1.4
4326819	11/21/2019	3/27/2020	127	Gym	1.2
4326817	11/21/2019	3/27/2020	127	Gym Duplicate	1.0
4326804	11/21/2019	3/27/2020	127	10A	0.7
4326816	11/21/2019	3/27/2020	127	10B	0.6
4326906	11/21/2019	3/27/2020	127	10	0.9
4326803	11/21/2019	3/27/2020	127	Conference Room	<0.4
4326812	11/21/2019	3/27/2020	127	Room 9	1.2
43326810	11/21/2019	3/27/2020	127	Room 8	0.9
4326909	11/21/2019	3/27/2020	127	Room 7	0.6
4326814	11/21/2019	3/27/2020	127	Room 6	1.0
4326910	11/21/2019	3/27/2020	127	Custodial Office	0.7
4326809	11/21/2019	3/27/2020	127	Staff Lounge	0.9
4326806	11/21/2019	3/27/2020	127	Library	1.6
4326807	11/21/2019	3/27/2020	127	Library Duplicate	1.6
4326808	11/21/2019	3/27/2020	127	Computer Room	1.5
4326811	11/21/2019	3/27/2020	127	Room 3	0.9
4326815	11/21/2019	3/27/2020	127	Room 2	1.2
4326818	11/21/2019	3/27/2020	127	Sensory Room	1.0
4326908	11/21/2019	3/27/2020	127	Room 1	1.2

Bold - Indicates Exceeds Action Level
EPA Action Level: 4.0 pCi/L
"<": Below the level of detection

Kelsay Environmental
833 SE Main St., Suite 410
Portland, Oregon 97214

Radon Sampling Table
Hawthorne Elementary School
3205 Long St.
Sweet Home, OR

DEVICE NUMBER	START DATE	STOP DATE	Total Days	LOCATION	RADON pCi/L
4326813	11/21/2019	3/27/2020	127	1-B	1.3
4326826	11/21/2019	3/27/2020	127	1-A	0.9
4326827	11/21/2019	3/27/2020	127	Class 11	<0.4
4326828	11/21/2019	3/27/2020	127	Room 12	1.0
4326830	11/21/2019	3/27/2020	127	Room 14	2.8
4326829	11/21/2019	3/27/2020	127	Room 14 Duplicate	2.7
4327044	11/21/2019	3/27/2020	127	Room 13	2.1
4327043	11/21/2019	3/27/2020	127	Room 16	0.6
4327053	11/21/2019	3/27/2020	127	Room 15	<0.4
4327054	11/21/2019	3/27/2020	127	Room 17	0.5
4327052	11/21/2019	3/27/2020	127	Room 18	0.5
4327055	11/21/2019	3/27/2020	127	Room 19	<0.4
4327144	11/21/2019	3/27/2020	127	Spike	6.4
4326936				Blank	TBD
4326951				Blank	TBD

Bold - Indicates Exceeds Action Level
EPA Action Level: 4.0 pCi/L
"<": Below the level of detection

Kelsay Environmental
833 SE Main St., Suite 410
Portland, Oregon 97214

NELAC NY 11769
NRPP 103216 AL
NRSB ARL0017

EPA Method #402-R-92-004
Alpha Track
NRPP Device Code 8205
NRSB Device Code 12001

Laboratory Report for:

Property Tested:

Kelsay Environmental
833 Southeast Main Street 410
Portland OR 97214

Hawthorne Elementary
3205 Long Street
Sweet Home OR 97386


Log Number	Device Number	Test Exposure Duration:		Area Tested	Result pCi/L
2673741	4326802	11/21/2019	03/27/2020	Office	1.0
2673742	4326907	11/21/2019	03/27/2020	Main Office	1.0
2673743	4326801	11/21/2019	03/27/2020	Office	1.0
2673744	4326820	11/21/2019	03/27/2020	Gym	1.4
2673745	4326819	11/21/2019	03/27/2020	Gym	1.2
2673746	4326817	11/21/2019	03/27/2020	Gym Duplicate	1.0
2673747	4326804	11/21/2019	03/27/2020	Room 10A	0.7
2673748	4326816	11/21/2019	03/27/2020	Room 10B	0.6
2673749	4326906	11/21/2019	03/27/2020	Room 10	0.9
2673750	4326803	11/21/2019	03/27/2020	Conference Room	< 0.4
2673751	4326812	11/21/2019	03/27/2020	Room 9	1.2

Comment: Confidential: Release results to client only. Kelsay Environmental was emailed a copy of this report.

Test Performed By: Placed: Lisa Janik Retrieved: Lisa Janik

Distributed by: Kelsay Environmental

Date Received: 04/07/2020 Date Logged: 04/22/2020 Date Analyzed: 05/04/2020 Date Reported: 05/19/2020

Report Reviewed By: 

Report Approved By: 

Disclaimer:

Shawn Price, Director of Laboratory Operations, AccuStar Labs

The uncertainty of this radon measurement is $\pm 15\%$. Factors contributing to uncertainty include statistical variations, daily and seasonal variations in radon concentrations, sample collection techniques, and operation of the dwelling. Interference with test conditions may influence the test results.

This report may only be transferred to a third party in its entirety. Analytical results relate to the samples AS RECEIVED BY THE LABORATORY. Results shown on this report represent levels of radon gas measured between the dates shown in the room or area of the site identified above as "Property Tested". Incorrect information will affect results. The results may not be construed as either predictive or supportive of measurements conducted in any area of this structure at any other time. AccuStar Labs, its employees and agents are not responsible for the consequences of any action taken or not taken based upon the results reported or any verbal or written interpretation of the results.

NELAC NY 11769
NRPP 103216 AL
NRSB ARL0017

EPA Method #402-R-92-004
Alpha Track
NRPP Device Code 8205
NRSB Device Code 12001

Laboratory Report for:

Property Tested:

Kelsay Environmental
833 Southeast Main Street 410
Portland OR 97214

Hawthorne Elementary
3205 Long Street
Sweet Home OR 97386


Log Number	Device Number	Test Exposure Duration:		Area Tested	Result pCi/L
2673752	4326810	11/21/2019	03/27/2020	Room 8	0.9
2673753	4326909	11/21/2019	03/27/2020	Room 7	0.6
2673754	4326814	11/21/2019	03/27/2020	Room 6	1.0
2673755	4326910	11/21/2019	03/27/2020	Custodial Office	0.7
2673756	4326809	11/21/2019	03/27/2020	Staff Lounge	0.9
2673757	4326806	11/21/2019	03/27/2020	Library	1.6
2673758	4326807	11/21/2019	03/27/2020	Library Duplicate	1.6
2673759	4326808	11/21/2019	03/27/2020	Computer Room 4	1.5
2673760	4326811	11/21/2019	03/27/2020	Room 3	0.9
2673761	4326815	11/21/2019	03/27/2020	Room 2	1.2
2673762	4326818	11/21/2019	03/27/2020	Sensory Room	1.0

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Test Performed By: Placed: Lisa Janik Retrieved: Lisa Janik

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NELAC NY 11769
NRPP 103216 AL
NRSB ARL0017

EPA Method #402-R-92-004
Alpha Track
NRPP Device Code 8205
NRSB Device Code 12001

Laboratory Report for:

Property Tested:

Kelsay Environmental
833 Southeast Main Street 410
Portland OR 97214

Hawthorne Elementary
3205 Long Street
Sweet Home OR 97386


Log Number	Device Number	Test Exposure Duration:		Area Tested	Result pCi/L
2673763	4326908	11/21/2019	03/27/2020	Room 1	1.2
2673764	4326813	11/21/2019	03/27/2020	Room 1-B	1.3
2673765	4326826	11/21/2019	03/27/2020	Room 1A	0.9
2673766	4326827	11/21/2019	03/27/2020	Class 11	< 0.4
2673767	4326828	11/21/2019	03/27/2020	Room 12	1.0
2673768	4326830	11/21/2019	03/27/2020	Room 14	2.8
2673769	4326829	11/21/2019	03/27/2020	Room 14 Duplicate	2.7
2673770	4327044	11/21/2019	03/27/2020	Room 13	2.1
2673771	4327043	11/21/2019	03/27/2020	Room 16	0.6
2673772	4327053	11/21/2019	03/27/2020	Room 15	< 0.4
2673773	4327054	11/21/2019	03/27/2020	Room 17	0.5

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Distributed by: Kelsay Environmental

Date Received: 04/07/2020 Date Logged: 04/22/2020 Date Analyzed: 05/04/2020 Date Reported: 05/19/2020

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NELAC NY 11769
NRPP 103216 AL
NRSB ARL0017

EPA Method #402-R-92-004
Alpha Track
NRPP Device Code 8205
NRSB Device Code 12001

Laboratory Report for:

Property Tested:

Kelsay Environmental
833 Southeast Main Street 410
Portland OR 97214

Hawthorne Elementary
3205 Long Street
Sweet Home OR 97386


Log Number	Device Number	Test Exposure Duration:		Area Tested	Result pCi/L
2673774	4327052	11/21/2019	03/27/2020	Room 18	0.5
2673775	4327055	11/21/2019	03/27/2020	Room 19	< 0.4
2673776	4327144	11/21/2019	03/27/2020	Spike	6.4

Comment: Confidential: Release results to client only. Kelsay Environmental was emailed a copy of this report.

Test Performed By: Placed: Lisa Janik Retrieved: Lisa Janik

Distributed by: Kelsay Environmental

Date Received: 04/07/2020 Date Logged: 04/22/2020 Date Analyzed: 05/04/2020 Date Reported: 05/19/2020

Report Reviewed By: 

Report Approved By: 

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AccuStar Labs
2 Sabier Way
Ward Hill, MA 01835
888-480-8812

Alpha Track Test Datasheet

1/4

Send Written Report To: (print clearly)

Kelsay Environmental
833 SE Main St.
Portland, OR 97214

Project Number:

Site Name
Address

City State Zip

Technician Name:

Hawthorne Elementary
3205 Long St.
Sweet Home, OR 97386
Lisa Smith

Contact: _____ Tel: _____

E-Mail Address: LSmith_KES@gmail.com

Technician Signature:

(if required)

Tech Certification #:

(if required)

Start your test before the expiration date shown on your device or your test results will be invalid.

Lab Use Only	Device Number	Building #	Unit #	Floor	Name of Room	Start Date <small>Month/Day/Year</small>	Stop Date <small>Month/Day/Year</small>	Lab Use
	4326802		1		Office	11/21/19	3/27/20	
	4326807		2		Office main			
	4326801		3		Office			
	4326820		4		Gym			
	4326819		5		Gym			
	4326817		6		Gym - Duplicate			
	4326804		7		10A			
	4326816		8		10-B			
	4326806		9		10			
	4326803		10		Conf. Room			



AccuStar Labs
2 Silver Way
Ward Hill, MA 01835
888-480-8812

Alpha Track Test Datasheet

2/14

Send Written Report To: (print clearly)

Project Number:
Site Name
Address

Hawthorne Elementary

City State Zip

Contact: _____ Tel: _____

Technician Name:

E-Mail Address: _____

Technician Signature:

(if required) _____ Tech Certification #: _____
(if required)

Start your test before the expiration date shown on your device or your test results will be invalid.

Lab Use Only	Device Number	Building #	Unit #	Floor	Name of Room	Start Date Month/Day/Year	Stop Date Month/Day/Year	Lab Use
	4326812	✓	11		Room 9			
	4326810	✓	12		Room 8			
	4326909	✓	13		Room 7			
	4326814	✓	14		Room 6			
	4326910	✓	15		custodial office			
	4326809	✓	16		staff lounge			
	4326806	✓	17		Library			
	4326807	✓	18		Library duplicate computer			
	4326808	✓	19		4 room			
	4326811	✓	20		Room 3			

Place up to 10 devices together with the matching datasheet in a plastic "zip lock" bag. Please see the back of this datasheet for test instructions.



AccuStar Labs
2 Saber Way
Ward Hill, MA 01835
888-480-8812

Alpha Track Test Datasheet

3/4

Send Written Report To: (print clearly)

Project Number:

Site Name

Address

City State Zip

Contact: _____ Tel: _____

Technician Name:

E-Mail Address: _____

Technician Signature:

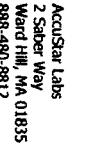
(if required)

Tech Certification #: _____
(if required)

Start your test before the expiration date shown on your device or your test results will be invalid.

Lab Use Only	Device Number	Building #	Unit #	Floor	Name of Room	Start Date Month/Day/Year	Stop Date Month/Day/Year	Lab Use
	4326815	✓	21		Room 2			
	4326818	✓	22		Sensory room			
	4326908	✓	23		Room 1			
	4326813	✓	24		1-B			
	4326826	✓	25		1 A			
	4326827	✓	26		Class 11			
	4326828	✓	27		Room 10			
	4326830	✓	28		Room 14			
	4326829	✓	29		Room 14 Duplicate			
	4327044	✓	30		13			

Place up to 10 devices together with the matching datasheet in a plastic "zip lock" bag. Please see the back of this datasheet for test instructions.



4/4

Hautstone Elementary

City State Zip

Technician Name:

Technician Signature:

Tech Certification #:

(if required)

[illegible]

Rev 180628

Start test before expiration date on device or result will be invalid.

Radon in Air Test Data Sheet

Send Written Report To:

Kelsey Environmental

Project Number:

Site Name

Address

City State Zip

Hauthorn's Elementary
3205 Lem St
Sweet Home, OR

Contact:

Tel:

E-Mail Address: LSanki.ks@gmail.com

Person Conducting Test:

Lisa Smith

Start Date:

BREISACH. KOS

Stop Date:

Start and Stop Times and Dates

must be entered

[illegible]

EXPOSURE IN BOWSER-MORNER RADON CHAMBER

CLIENT Kelsay Environmental

Job Number 194665

NOMINAL Conditions: Radon Conc 25.9 pCi/L Rel. Hum 50.1 % Temp. 70.2 F
777.2 pCi/L

Date Start: 2/9/20 Date Stop: 3/10/20

Date Start: _____ Date Stop: _____

Time Start: 0817 Time Stop: 0817

Time Start: _____ Time Stop: _____

Device No.'s: (24) Alpha Tracks -

Device No.'s: _____

4326967, 4326968, 4327065, 4326966,

4327143, 4326953, 4327142, 4326955,

4327063, 4327061, 4327064, 4327141,

4327092, 4327093, 4327094, 4327091,

4326970, 4327095, 4326954, 4327059,

ms right 4327060, 4327062, 4326969, 4327144

$$127 \text{ Day Conversion: } 30 \times 25.9 = 6.1 \text{ pCi/L}$$

127