

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 Foster Elementary School (DRAFT)

Kelsay Environmental performed a long-term radon survey at Foster Elementary School located at 5526 Poplar St., Sweet Home, OR. 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. Foster 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 30 rooms were tested (see attached table for locations). In addition, 4 duplicates, one spike and a blank were submitted to the lab to ensure quality control. A total of 40 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 that Rooms 8, 10, 11 and 12 were above 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
FOSTER ELEMENTARY SCHOOL

Sample No.	Sample Variety	Location	Results (pCi/L)	Relative Percentage Error/Difference	Acceptance
4327143	Spike	NA	6.2	1.63 %	Yes
4326912/ 4326914	Duplicate/Original	Speech Room	1.3/1.4	7.40%	Yes
4326849/ 4326947	Duplicate/Original	Room 8	4.0/3.9	-1.68%	Yes
4326860/ 4326858	Duplicate/Original	Room 11	5.0/5.0	0%	Yes
4327086/ 4326854	Duplicate/Original	Library	2.2/1.9	-14.63%	Yes
4326996	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

Recommendations for Remediation Process

Radon levels in rooms 8, 10, 11 and 12 measured 4.0 pCi/L or above. The EPA recommends that follow-up testing of rooms greater than 4.0 or greater be conducted before any remediation decisions are made. Room 8 had a duplicate sample that tested 4.0 pCi/L, Room 10 tested 4.1 pCi/L, Room 11 tested 5.8 pCi/L and room 12 tested 5.4 pCi/L.

Mitigation for radon can most easily be controlled through adjustments of the heating, ventilation, and air-conditioning (HVAC) system that serves each room. Increasing the air exchange rate can help provide fresh air that effectively dilutes high radon levels to safe levels. If follow-up samples fail to indicate levels below 4.0 pCi/L, remediation is required.

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
Foster Elementary
5526 Poplar St.
Sweet Home, Oregon

DEVICE NUMBER	START DATE	STOP DATE	Total Days	LOCATION	RADON pCi/L
4326978	11/21/2019	3/27/2020	127	Office Main	1.9
4327117	11/21/2019	3/27/2020	127	Office Principal	1.7
4326913	11/21/2019	3/27/2020	127	Office Health	2.1
4327116	11/21/2019	3/27/2020	127	Office Conference	2.6
4326976	11/21/2019	3/27/2020	127	Staff Room	2.7
4326915	11/21/2019	3/27/2020	127	Room	1.6
4326977	11/21/2019	3/27/2020	127	Mr. Hunt	2.2
4326914	11/21/2019	3/27/2020	127	Speech	1.4
4326912	11/21/2019	3/27/2020	127	Speech Duplicate	1.3
4327118	11/21/2019	3/27/2020	127	Room 1	2.4
4327119	11/21/2019	3/27/2020	127	Mrs. Peak	2.0
4326846	11/21/2019	3/27/2020	127	Room 2	1.7
4326938	11/21/2019	3/27/2020	127	Room 3	1.8
4326848	11/21/2019	3/27/2020	127	Room 4	0.9
4326850	11/21/2019	3/27/2020	127	Room 5	1.2
4326948	11/21/2019	3/27/2020	127	Room 6	1.4
4326946	11/21/2019	3/27/2020	127	Room 7	2.7
4326947	11/21/2019	3/27/2020	127	Room 8	3.9
4326849	11/21/2019	3/27/2020	127	Room Duplicate	4.0
4326847	11/21/2019	3/27/2020	127	Stage	2.4
4326937	11/21/2019	3/27/2020	127	Room Behind Stage	3.2
4326949	11/21/2019	3/27/2020	127	Cafeteria	2.2
4326841	11/21/2019	3/27/2020	127	Cafeteria	2.4

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
Foster Elementary
5526 Poplar St.
Sweet Home, Oregon

DEVICE NUMBER	START DATE	STOP DATE	Total Days	LOCATION	RADON pCi/L
4326857	11/21/2019	3/27/2020	127	Room 9	3.9
4326843	11/21/2019	3/27/2020	127	Room 10	4.1
4326858	11/21/2019	3/27/2020	127	Room 11	5.0
4326860	11/21/2019	3/27/2020	127	Room 11 Duplicate	5.0
4326859	11/21/2019	3/27/2020	127	Room 12	5.4
4326856	11/21/2019	3/27/2020	127	Room 13	3.8
4326844	11/21/2019	3/27/2020	127	Room 14	2.2
4326851	11/21/2019	3/27/2020	127	Gym	Sample Not Found
4326845	11/21/2019	3/27/2020	127	Gym	0.9
4326842	11/21/2019	3/27/2020	127	Gym Office	1.0
4326852	11/21/2019	3/27/2020	127	Gym	1.0
4326854	11/21/2019	3/27/2020	127	Library	1.9
4327086	11/21/2019	3/27/2020	127	Library Duplicate	2.2
4326855	11/21/2019	3/27/2020	127	Library	Sample Not Found
4326853	11/21/2019	3/27/2020	127	Library Office	2.2
4327143	11/21/2019	3/27/2020	127	Spike	6.2
4326996				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

Foster Elementary
5526 Poplar Street
Sweet Home OR 97386


Log Number	Device Number	Test Exposure Duration:		Area Tested	Result pCi/L
2673828	4326978	11/21/2019	03/27/2020	Office Main	1.9
2673829	4327117	11/21/2019	03/27/2020	Office Principle	1.7
2673830	4326913	11/21/2019	03/27/2020	Office Health	2.1
2673831	4327116	11/21/2019	03/27/2020	Office Conference	2.6
2673832	4326976	11/21/2019	03/27/2020	Staff Room	2.7
2673833	4326915	11/21/2019	03/27/2020	Room	1.6
2673834	4326977	11/21/2019	03/27/2020	Mr. Hunt	2.2
2673835	4326914	11/21/2019	03/27/2020	Speech	1.4
2673836	4326912	11/21/2019	03/27/2020	Speech Duplicate	1.3
2673837	4327118	11/21/2019	03/27/2020	Room 1	2.4
2673838	4327119	11/21/2019	03/27/2020	Mrs. Peak	2.0

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: 05/05/2020 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 +/- 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

Foster Elementary
5526 Poplar Street
Sweet Home OR 97386


Log Number	Device Number	Test Exposure Duration:		Area Tested	Result pCi/L
2673839	4326846	11/21/2019	03/27/2020	Room 2	1.7
2673840	4326938	11/21/2019	03/27/2020	Room 3	1.8
2673841	4326848	11/21/2019	03/27/2020	Room 4	0.9
2673842	4326850	11/21/2019	03/27/2020	Room 5	1.2
2673843	4326948	11/21/2019	03/27/2020	Room 6	1.4
2673844	4326946	11/21/2019	03/27/2020	Room 7	2.7
2673845	4326947	11/21/2019	03/27/2020	Room 8	3.9
2673846	4326849	11/21/2019	03/27/2020	Room Duplicate	4.0
2673847	4326847	11/21/2019	03/27/2020	Stage	2.4
2673848	4326937	11/21/2019	03/27/2020	Room Behind Stage	3.2
2673849	4326949	11/21/2019	03/27/2020	Cafeteria	2.2

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833 Southeast Main Street 410
Portland OR 97214

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5526 Poplar Street
Sweet Home OR 97386

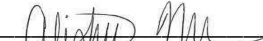
Log Number	Device Number	Test Exposure Duration:		Area Tested	Result pCi/L
2673850	4326841	11/21/2019	03/27/2020	Cafeteria	2.4
2673851	4326857	11/21/2019	03/27/2020	Room 9	3.9
2673852	4326843	11/21/2019	03/27/2020	Room 10	4.1
2673853	4326858	11/21/2019	03/27/2020	Room 11	5.0
2673854	4326860	11/21/2019	03/27/2020	Room 11 Duplicate	5.0
2673855	4326859	11/21/2019	03/27/2020	Room 12	5.4
2673856	4326856	11/21/2019	03/27/2020	Room 13	3.8
2673857	4326844	11/21/2019	03/27/2020	Room 14	2.2
2673858	4326845	11/21/2019	03/27/2020	Gym	0.9
2673859	4326842	11/21/2019	03/27/2020	Gym Office	1.0
2673860	4326852	11/21/2019	03/27/2020	Gym	1.0

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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

Foster Elementary
5526 Poplar Street
Sweet Home OR 97386


Log Number	Device Number	Test Exposure Duration:		Area Tested	Result pCi/L
2673861	4326854	11/21/2019	03/27/2020	Library	1.9
2673862	4327086	11/21/2019	03/27/2020	Library Duplicate	2.2
2673863	4326853	11/21/2019	03/27/2020	Library Office	2.2
2673864	4327143	11/21/2019	03/27/2020	Spike	6.2

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Send Written Report To: (print clearly)

Kelsay Environmental
833 SF Main St 410
Portland, OR 97214

Contact:

Tel: 503-995-8557

E-Mail Address:

LSMik, kels @ gmail.com
Bkelsay, kels

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

Project Number:

Site Name

Address

City State Zip

Technician Name:

Technician Signature:

(if required)

Tech Certification #:

(if required)

Foster Elementary
5520 Poplar St
Sweet Home, OR
Lisa Stamik

Lab Use Only	Device Number	Building #	Unit #	Floor	Name of Room	Start Date <small>Monthly/Day/Year</small>	Stop Date <small>Monthly/Day/Year</small>	Lab Use
	4326978	✓	1		Office: main	11/21/19	3/27/20	
	4327117	✓	2		Office: principle			
	4326913	✓	3		Office: Health			
	4327116	✓	4		Office: conference			
	4326976	✓	5		Staff Room			
	4326915	✓	6		Room			
	4326977	✓	7		Mr Hart			
	4326914	✓	8		Speech			
	4326912	✓	9		Speech Duplicate			
	4327118	✓	10		Room 1			



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

Alpha Track Test Datasheet

2/4

Send Written Report To: (print clearly)

Project Number:

Site Name

Address

City State Zip

Technician Name:

Technician Signature:

(if required)

Tech Certification #:

(if required)

Contact: _____ Tel: _____

E-Mail Address: _____

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
	4327119	✓	11		Mrs Peak			
	4326846	✓	12		Room 2			
	4326938	✓	13		Room 3			
	4326848	✓	14		Room 4			
	4326850	✓	15		Room 5			
	4326946	✓	16		Room 6			
	4326946	✓	17		Room 7			
	4326947	✓	18		Room 8			
	4326849	✓	19		Room Duplicate			
	4326847	✓	20		Stage			

3/4

Alpha Track Test Datasheet

AccuStar

AccuStar Labs
2 Sable Way
Ward Hill, MA 01835
888-480-8612

Send Written Report To: (print clearly)

Project Number:

Site Name

Address

City State Zip

Technician Name:

Contact: _____ Tel: _____

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 <small>Month/Day/Year</small>	Stop Date <small>Month/Day/Year</small>	Lab Use
	 *4326837*		21		Room behind stage			
	 *4326949*		22		cafeteria			
	 *4326841*		23		cafeteria			
	 *4326857*		24		Room 9			
	 *4326843*		25		Room 10			
	 *4326856*		26		Room 11			
	 *4326860*		27		Room 11 appliance			
	 *4326859*		28		Room 12			
	 *4326856*		29		Room 13			
	 *4326844*		30		Room 14			

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.

Send Written Report To: (print clearly)

Kelsey Environmental
833 SE Main St Ste 410
Portland, OR 97214

Contact: Tel: 503-995-8557

E-Mail Address: LJANIK.KE5@gmail.com
BKEL544.KE5

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

Project Number:

Site Name

Address

City State Zip

Technician Name:

Technician Signature:

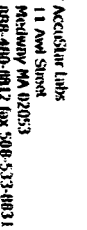
(if required)

Tech Certification #:

(if required)

Foster Elementary
55 2nd Paper St
Sweet Home, OR
Lisa Janik

Lab Use Only	Device Number	Building #	Unit #	Floor	Name of Room	Start Date	Stop Date	Lab Use
	4328851		31	X	Gym	11/21/19	3/28/20	
	4328845		32		Gym			
	4328842		33		Gym Office			
	4328852		34		Gym			
	4328854		35		Library			
	4327088		36		Library duplicate			
	4328855	X	37	X	Library			
	4328853		38		Library Office			
	4327143		39		SPICE			



Padon in Air Test Data Sheet

kelsoy Environmental

City State Zip

Foster Elementary
5526 Poplar St.
Sweet Home, OR

Tel:

USANK KE'S @gmail.com

Lisa Sanik

Boyle's Law

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