

**Final Radon Letter  
For  
The North Lake School District SD 14  
North Lake School  
57566 Fort Rock Road  
Silver Lake, Oregon 97638**

**EIS Job No. 2018069.radon final letter**

**Prepared For:**

**Gary Addington, Facilities  
North Lake School  
57566 Fort Rock Road  
Silver Lake, Oregon 97638**

**Prepared By:**

**Environmental Inspection Services  
11981 Fargo Road  
Aurora, Oregon 97002  
cell # (503) 680-6398  
EMAIL: charles\_a\_spear@yahoo.com**

*Charles A. Spear*

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**Charles A. Spear, Partner  
Environmental Professional**

**September 14, 2018**



**ENVIRONMENTAL INSPECTION SERVICES**

Bus: 503.678.5063 | Cell: 503.680.6398

11981 Fargo Road, NE, Aurora, OR 97002

www.environmentalinspectionsservices.net



**APPENDIX 1.0**  
**SCHOOL FLOOR PLAN**

**APPENDIX 2.0**  
**RADON ANALYTICAL TEST RESULTS**

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September 14, 2018  
EIS JOB No. 2018069. radon letter

Gary Addington, Facilities  
North Lake School  
57566 Fort Rock Road  
Silver Lake, Oregon 97638

RE: Radon testing of the North Lake School District SD 14  
Buildings located at 57566 Fort Rock Road in Silver Lake,  
Oregon 97638

Dear Mr. Gary Addington,

The radon testing of the subject property improvements collectively referred to as the North Lake School District SD 14 facilities located at 57566 Fort Rock Road in Silver Lake, Oregon was performed by Charles A. Spear, field representative of Environmental Inspection Services (EIS) with an escort thru the entire district improvements by Gary Addington on Friday, August 24, 2018. The samplers were collected on Monday August 27, 2018. The samplers were placed in the center of the functional classrooms, library, gymnasium, and office areas and the samplers were independently analyzed by EHS laboratories on Monday September 3, 2018 and actual analytical test results were received by EIS on Tuesday, September 4, 2018.

No non-scope Recognized Environmental Conditions (REC's) in the forms of elevated radon concentrations were analytically confirmed at the subject school building functional areas. A total of forty (40) single passive radon samplers were placed in functional classroom shop, and other student room areas throughout the subject buildings. All radon measurements were below one picocurie per liter (pCi/L) and below the action limit of 4 pCi/L. EIS noted no additional radon assessment requirements for the North Lake School District SD 14 facility buildings at this time.

In the opinion of EIS, no additional radon retesting is required at the North Lake School District SD 14 buildings. In the opinion of EIS, the satisfactory radon test results are indicative of satisfactory radon conditions in the functional classrooms and other student occupied spaces of the subject buildings and no radon mitigation is required at the district based on these test results. A total of forty (40) original passive activated charcoal (AC) adsorption radon testers were originally placed throughout the district buildings. The sample analytical position and result tables are listed as follows:

<b>DEVICE NO.</b>	<b>START DATE</b>	<b>END DATE</b>	<b>LOCATION</b>	<b>RESULT</b>
3753566	8/24/18	8/27/18	6 <sup>TH</sup> GRADE	0.40
3753599	8/24/18	8/27/18	READING	<0.40
3753596	8/24/18	8/27/18	LIBRARY	<0.40
3753584	8/24/18	8/27/18	LIBRARY	0.40
3753588	8/24/18	8/27/18	GYM	<0.40
3753571	8/24/18	8/27/18	GYM	<0.40
3753590	8/24/18	8/27/18	GYM	<0.40
3753582	8/24/18	8/27/18	KINDERGARTEN	<0.40
3753583	8/24/18	8/27/18	1 <sup>ST</sup> GRADE	<0.40
3753568	8/24/18	8/27/18	OFFICE	<0.40
3753600	8/24/18	8/27/18	SPEECH	<0.40
3753593	8/24/18	8/27/18	2 <sup>ND</sup> GRADE	0.40
3753585	8/24/18	8/27/18	3 <sup>RD</sup> GRADE	<0.40
3753594	8/24/18	8/27/18	4 <sup>TH</sup> GRADE	<0.40
3753592	8/24/18	8/27/18	5 <sup>TH</sup> GRADE	<0.40
3753587	8/24/18	8/27/18	ART	<0.40
3753580	8/24/18	8/27/18	SHOP OFFICE	<0.40
3753577	8/24/18	8/27/18	SHOP	0.40
3753597	8/24/18	8/27/18	SHOP	<0.40

<b>DEVICE NO.</b>	<b>START DATE</b>	<b>END DATE</b>	<b>LOCATION</b>	<b>RESULT</b>
3753604	8/24/18	8/27/18	SHOP	<0.40
3753578	8/24/18	8/27/18	SHOP	0.40
3753591	8/24/18	8/27/18	SHOP	<0.40
3753589	8/24/18	8/27/18	SHOP	0.40
3753572	8/24/18	8/27/18	LEARNING	0.40
3753569	8/24/18	8/27/18	HOME EC	0.60
3753570	8/24/18	8/27/18	HOME EC	0.80
3753567	8/24/18	8/27/18	KITCHEN	<0.40
3753601	8/24/18	8/27/18	MATH	0.40
3753602	8/24/18	8/27/18	COMP LAB	0.40
3753573	8/24/18	8/27/18	SOCIAL STUDIES	0.40
3753586	8/24/18	8/27/18	SCIENCE	0.40
3753576	8/24/18	8/27/18	OFFICE	<0.40
3753565	8/24/18	8/27/18	OFFICE	0.40
3753574	8/24/18	8/27/18	SUPER OFFICE	0.50
3753595	8/24/18	8/27/18	HEALTH	0.50
3753575	8/24/18	8/27/18	NEUMAN CLASS	<0.40
3753579	8/24/18	8/27/18	FACULTY	<0.40
3753598	8/24/18	8/27/18	FACULTY	<0.40
3753581	8/24/18	8/27/18	COMPUTER	<0.40
3753603	8/24/18	8/27/18	ANNEX	0.40

EIS recommends no additional radon measurements at the subject school district property based on these satisfactory analytical test results in all adjoining spaces and nearby functional areas of the district buildings. No data gaps remain concerning radon risk at the subject property based on current acceptable analytical radon test results. Actual radon analytical test results are listed in this report.

### RADON

Radon gas is an extremely toxic, chemically inert, odorless, colorless, and tasteless naturally-occurring radioactive element having the symbol Rn. Radon has the atomic number 86; an atomic weight of 222; a melting point of -71 degrees Celsius; a boiling point of -62 degrees; and 18 radioactive isotopes. It is derived from the radioactive decay of radium and is used in cancer treatment; as a tracer in leak detection; and in radiology. Forty radon testers were placed throughout the subject district school buildings and no radon concerns were analytically confirmed on-site. All radon samplers were analytically tested for the presence of radon on 9/3/18 by a contract laboratory known as AccuStar Labs of the certified laboratory known as EHS Laboratories at 7469 Whitepine Road in Richmond, Virginia by EPA Test Method # 402-R-92-004.

Average - 0.40 pCi/L result - (below 4pCi/L)

In the opinion of EIS, no additional radon retesting is required at The North Lake School District SD 14 North Lake School at 57566 Fort Rock Road in Silver Lake, Oregon 97638. In the opinion of EIS, the satisfactory radon test results are indicative of satisfactory radon conditions in the district school buildings and no radon mitigation is required based on these test results. If there are any questions feel free to contact me at (503) 680-6398.

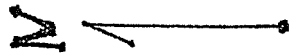
Respectfully,

  
Charles A. Spear  
Environmental Professional

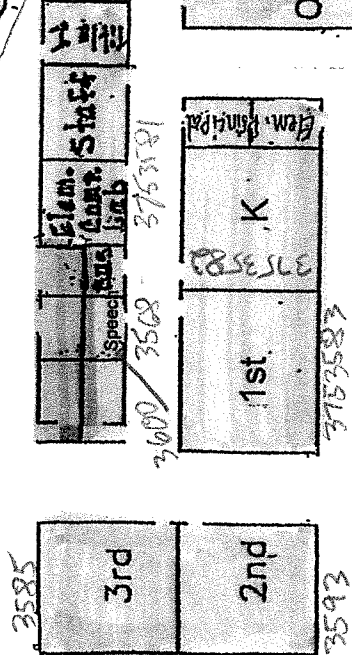
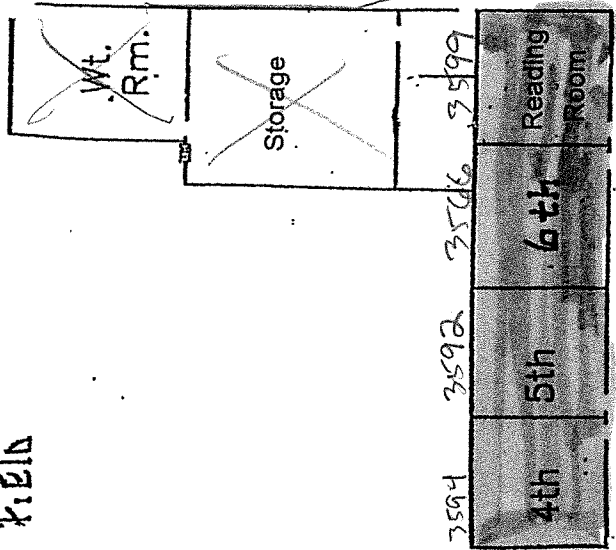
**APPENDIX 1.0**  
**SCHOOL FLOOR PLAN**

Football Field

Tennis Court

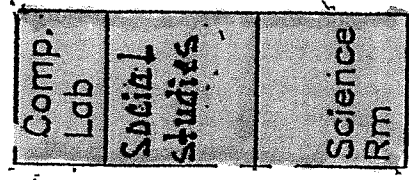
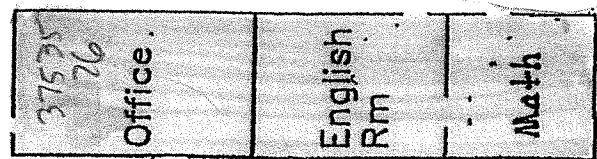
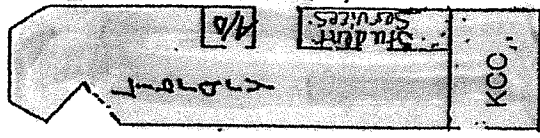
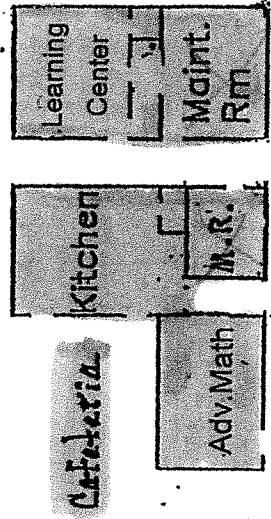
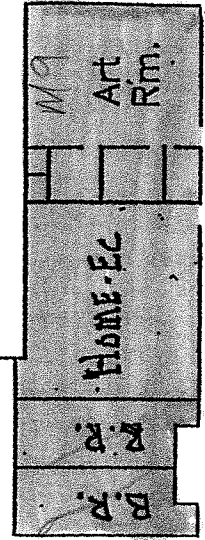
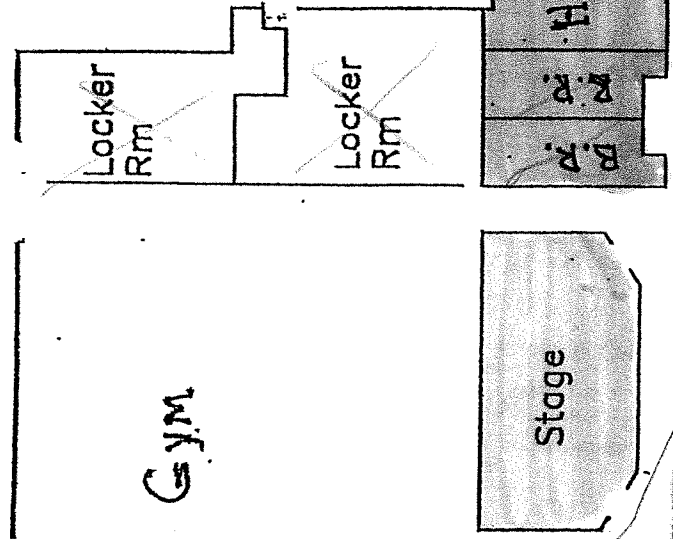


North West Playground



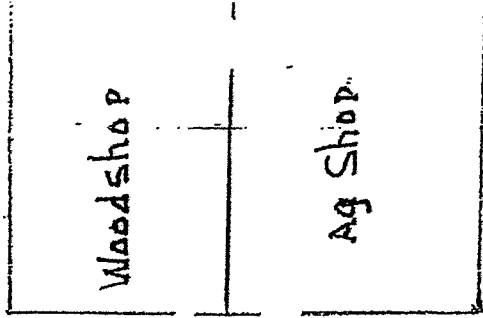
ANNEX  
3603

West Parking Lot



Commons

South Entrance



East Parking Lot



Football Field

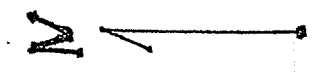
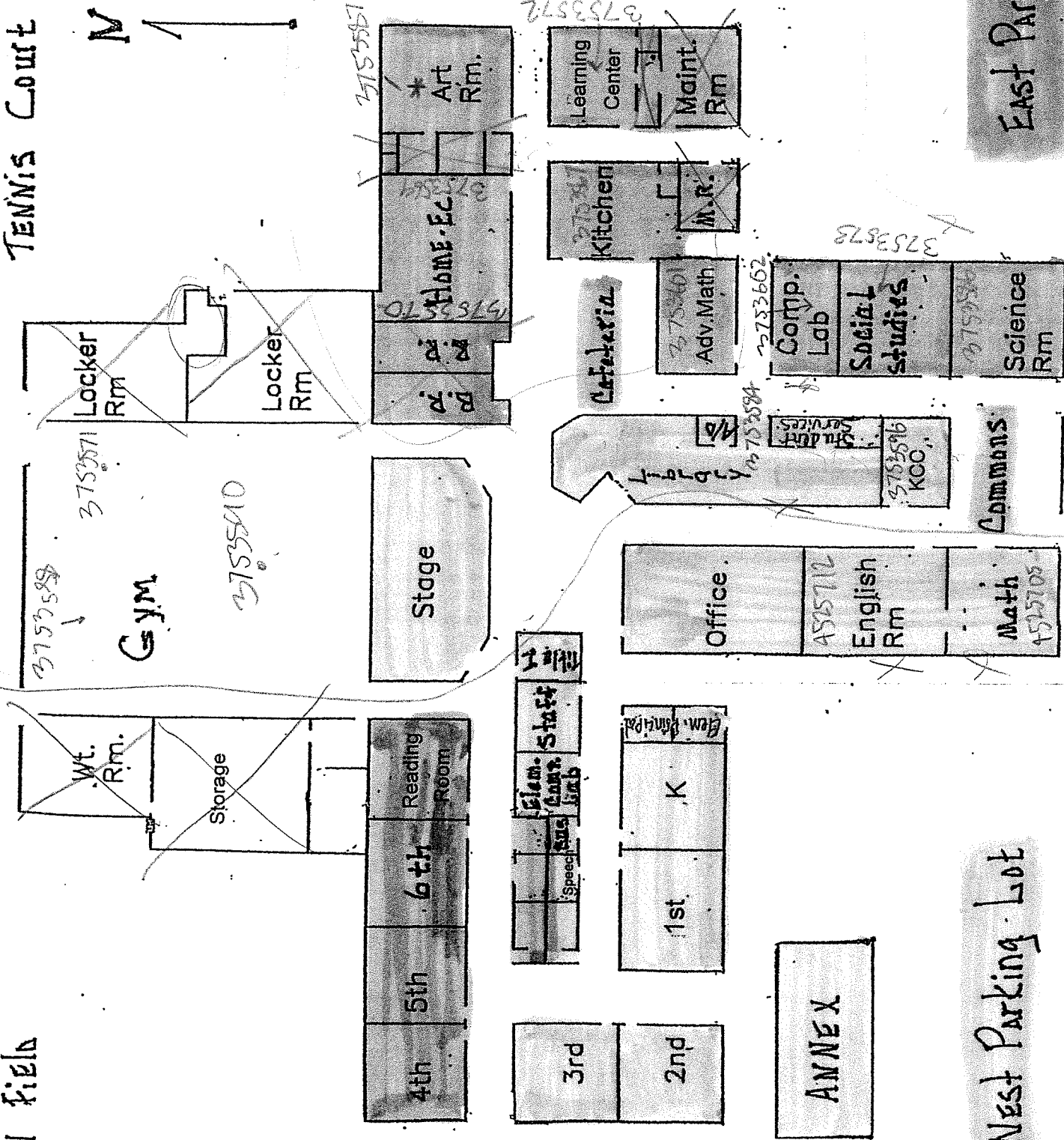
Tennis Court

North West Playground

West Parking Lot

East Parking Lot

South Entrance



**APPENDIX 2 .0**

**RADON ANALYTICAL TEST RESULTS**



Environmental Hazards Services, L.L.C.  
7469 Whitepine Rd  
Richmond, VA 23237  
Telephone: 800.347.4010

## Radon In Air Analysis Report

Report Number: 18-08-04554

**Client:** Environmental Inspection Services  
11981 Fargo Road, NE  
Aurora, OR 97002

**Received Date:** 08/30/2018

**Reported Date:** 09/04/2018

**Analysis By:** AccuStar Labs

**Project/Test Address:** 57566 County Hwy 5-10; Silver Lake, OR 97638

Client Number:  
38-1916

# Laboratory Results

Fax Number:  
503-678-5063

Lab Sample Number	Device Number	Test Began	Test Ended	Collection Location	Concentration pCi/L	Narrative ID
18-08-04554-001	3753572	08/24/2018 11:05:00 AM	08/27/2018 12:01:00 PM		0.40	
18-08-04554-002	3753569	08/24/2018 11:10:00 AM	08/27/2018 11:58:00 AM		0.60	
18-08-04554-003	3753570	08/24/2018 11:10:00 AM	08/27/2018 11:58:00 AM		0.80	
18-08-04554-004	3753567	08/24/2018 11:15:00 AM	08/27/2018 11:57:00 AM	KITCHEN	<0.40	
18-08-04554-005	3753601	08/24/2018 11:15:00 AM	08/27/2018 11:55:00 AM		0.40	
18-08-04554-006	3753602	08/24/2018 11:20:00 AM	08/27/2018 11:54:00 AM		0.40	
18-08-04554-007	3753573	08/24/2018 11:20:00 AM	08/27/2018 11:34:00 AM	SOCIAL STUDIES	0.40	
18-08-04554-008	3753586	08/24/2018 11:25:00 AM	08/27/2018 11:26:00 AM	SCIENCE	0.40	
18-08-04554-009	3753576	08/24/2018 10:45:00 AM	08/27/2018 11:04:00 AM	OFFICE	<0.40	
18-08-04554-010	3753565	08/24/2018 10:50:00 AM	08/27/2018 11:04:00 AM	OFFICE	0.40	
18-08-04554-011	3753574	08/24/2018 10:52:00 AM	08/27/2018 11:06:00 AM	SUPER OFFICE	0.50	

## Environmental Hazards Services, L.L.C

**Client Number:** 38-1916  
**Project/Test Address:** 57566 County Hwy 5-10; Silver Lake, OR 97638

**Report Number:** 18-08-04554

Lab Sample Number	Device Number	Test Began	Test Ended	Collection Location	Concentration pCi/L	Narrative ID
18-08-04554-012	3753595	08/24/2018 10:53:00 AM	08/27/2018 11:06:00 AM	HEALTH	0.50	
18-08-04554-013	3753575	08/24/2018 10:56:00 AM	08/27/2018 11:08:00 AM	NEUMAN CLASS	<0.40	
18-08-04554-014	3753579	08/24/2018 10:58:00 AM	08/27/2018 11:09:00 AM	FACULTY	<0.40	
18-08-04554-015	3753598	08/24/2018 10:59:00 AM	08/27/2018 11:09:00 AM	FACULTY	<0.40	
18-08-04554-016	3753581	08/24/2018 11:01:00 AM	08/27/2018 11:45:00 AM	COMPUTER	<0.40	
18-08-04554-017	3753603	08/24/2018 11:32:00 AM	08/27/2018 11:48:00 AM	ANNEX	0.40	
18-08-04554-018	3753566	08/24/2018 11:18:00 AM	08/27/2018 11:17:00 AM	6TH GRADE	0.40	
18-08-04554-019	3753599	08/24/2018 11:19:00 AM	08/27/2018 11:17:00 AM	READING	<0.40	
18-08-04554-020	3753596	08/24/2018 11:25:00 AM	08/27/2018 11:20:00 AM	BACKROOM LIBRARY	<0.40	
18-08-04554-021	3753584	08/24/2018 11:30:00 AM	08/27/2018 11:19:00 AM	LIBRARY	0.40	
18-08-04554-022	3753588	08/24/2018 11:30:00 AM	08/27/2018 11:43:00 AM	GYM	<0.40	
18-08-04554-023	3753571	08/24/2018 11:35:00 AM	08/27/2018 11:43:00 AM	GYM	<0.40	
18-08-04554-024	3753590	08/24/2018 11:35:00 AM	08/27/2018 11:43:00 AM	GYM	<0.40	
18-08-04554-025	3753582	08/24/2018 11:03:00 AM	08/27/2018 11:10:00 AM	KINDERGARTEN	<0.40	
18-08-04554-026	3753583	08/24/2018 11:05:00 AM	08/27/2018 11:11:00 AM	1ST GRADE	<0.40	
18-08-04554-027	3753568	08/24/2018 11:07:00 AM	08/27/2018 11:11:00 AM	OFFICE	<0.40	
18-08-04554-028	3753600	08/24/2018 11:08:00 AM	08/27/2018 11:45:00 AM	SPEECH	<0.40	
18-08-04554-029	3753593	08/24/2018 11:10:00 AM	08/27/2018 11:13:00 AM	2ND GRADE	0.40	

## Environmental Hazards Services, L.L.C

**Client Number:** 38-1916  
**Project/Test Address:** 57566 County Hwy 5-10; Silver Lake, OR 97638

**Report Number:** 18-08-04554

Lab Sample Number	Device Number	Test Began	Test Ended	Collection Location	Concentration pCi/L	Narrative ID
18-08-04554-030	3753585	08/24/2018 11:12:00 AM	08/27/2018 11:14:00 AM	3RD GRADE	<0.40	
18-08-04554-031	3753594	08/24/2018 11:13:00 AM	08/27/2018 11:14:00 AM	4TH GRADE	<0.40	
18-08-04554-032	3753592	08/24/2018 11:15:00 AM	08/27/2018 11:15:00 AM	5TH GRADE	<0.40	
18-08-04554-033	3753587	08/24/2018 10:36:00 AM	08/27/2018 12:01:00 PM	ART	<0.40	
18-08-04554-034	3753580	08/24/2018 10:45:00 AM	08/27/2018 12:03:00 PM	SHOP OFFICE	<0.40	
18-08-04554-035	3753577	08/24/2018 10:45:00 AM	08/27/2018 12:07:00 PM	SHOP	0.40	
18-08-04554-036	3753597	08/24/2018 10:45:00 AM	08/27/2018 12:06:00 PM	SHOP	<0.40	
18-08-04554-037	3753604	08/24/2018 10:45:00 AM	08/27/2018 12:05:00 PM	SHOP	<0.40	
18-08-04554-038	3753578	08/24/2018 10:55:00 AM	08/27/2018 12:05:00 PM	SHOP	0.40	
18-08-04554-039	3753591	08/24/2018 10:55:00 AM	08/27/2018 12:05:00 PM	SHOP	<0.40	
18-08-04554-040	3753589	08/24/2018 11:00:00 AM	08/27/2018 12:06:00 PM	SHOP	0.40	

# Environmental Hazards Services, L.L.C

Client Number: 38-1916

Report Number: 18-08-04554

Project/Test Address: 57566 County Hwy 5-10; Silver Lake, OR 97638

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Lab Sample Number	Device Number	Test Began	Test Ended	Collection Location	Concentration pCi/L	Narrative ID
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Method: EPA Method #402-R-92-004

Reviewed By Authorized Signatory:



Deborah Britt

QA/QC Clerk

The EPA action level for Radon in Air is 4.0 pCi/L. The national average indoor radon level is 1.3 pCi/L. Sample Results denoted with a "less than" (<) sign contains less than 0.4 pCi/L.

The uncertainty of this radon measurement is ~ +/- 10%. 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.

The condition of the samples analyzed was acceptable upon receipt per laboratory protocol unless otherwise noted on this report. Results represent the analysis of samples submitted by the client. Sample location, testing dates, etc., was provided by the client. This report shall not be reproduced except in full, without the written consent of the Environmental Hazards Service, L.L.C.

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LEGEND                      pCi/L= picocuries per liter

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**APPENDIX 3.0**  
**CHAIN'S OF CUSTODY (COC'S)**



ENVIRONMENTAL HAZARDS SERVICES, LLC

**RADONS MART**

Chain-of-Custody Form

Phone: (800) 347-4010 FAX: (804) 275-4907  
ONLINE CLIENT PORTAL AVAILABLE FOR ANALYSIS RESULTS AT: www.leadlab.com

4554  
~For Lab Use Only~  
Please send this kit to:  
2 Saber Way  
Ward Hill, MA 01835-8000

Company Name: Swimmaledt Inspects Services

Account #:

Address: 1181 Fargo Rd

City/State/Zip:

Arroyo, Oregon 97022

Phone: 503-680-6348

Email:

Charles Spear Ogilvie, Inc.

Testing Address: 57566 County Hwy 570

City/State:

Silver Lake, Oregon 97638

Collected By:

Date:

Certification #:

Relinquished By:

Date:

Received By:

Jurkole

Date:

8/30/18 4:35pm

\*\*\* Failure to completely fill out the following chart with collection information for each sample may cause a 5 day delay in receiving your laboratory results. \*\*\*

Sample No.	Device Number	Radon-in-Air Start Date	Radon-in-Air Start Time	Radon-in-Air End Date	Radon-in-Air End Time	Collection Location (Basement, Family Room, Kitchen Sink, Bathroom Tub, etc.)
1	3753566	8/24/18	11:18	8-27	11:17	6TH GRADE
2	3753599		11:19		11:17	REAR DINING
3	3753596		11:25		11:20	BALCONY ROOM LIBRARY
4	3753584		11:30		11:19	L.I.B. ROOM
5	3753588		11:30		11:43	Gym
6	3753591		11:35		11:43	Gym
7	3753590		11:35		11:43	Gym
8	4525700		11:45		11:24	M1

Comments/Measurement Conditions:

4525712 PND blockade

11:24 M1





ENVIRONMENTAL HAZARDS SERVICES, LLC

RADONS MART

Chain-of-Custody Form

Phone: (800) 347-4010 FAX: (804) 275-4907

ONLINE CLIENT PORTAL AVAILABLE FOR ANALYSIS RESULTS AT: www.leadlab.com

~For Lab Use Only~  
Please send this kit to:  
2 Saber Way  
Ward Hill, MA 01835-8000

Laboratories™

Company Name: Environmental Inspection Services

Address: 11981 Fargo Road

Phone: 03-680-6398 Email: Charles A. Spear

Testing Address: 57566 Coates Hwy 5-10 City/State: Silver Lake, OR 97633

Collected By: Charles Spear Date: 8/11/18 Certification #:                     

Relinquished By: Charles Spear Date: 8/27/18 Received By: Michelle

Account #:                     

City/State/zip: Astoria, Oregon 97002

Date: 8/30/18 4:35 PM

\*\*\* Failure to completely fill out the following chart with collection information for each sample may cause a 5 day delay in receiving your laboratory results. \*\*\*

Sample No.	Device Number	Radon-in-Air Start Date	Radon-in-Air Start Time	Radon-in-Air End Date	Radon-in-Air End Time	Collection Location (Basement, Family Room, Kitchen Sink, Bathroom Tub, etc.)
1	3753582	8/24/18	11:03	8-27	11:10	KLN PBR GARTE W
2	3753583		11:05		11:11	1ST GRAD E
3	3753568		11:07		11:11	OP P ICE
4	3753600		11:08		11:45	PP BEACH *
5	3753593		11:10		11:13	2ND GRAD E
6	3753585		11:12		11:14	3RD GRAD E
7	3753594		11:13		11:14	4TH GRAD E
8	3753592		11:15		11:15	5TH GRAD E

Comments/Measurement Conditions:



ENVIRONMENTAL HAZARDS SERVICES, LLC

**RADONSMART**

Chain-of-Custody Form

Phone: (800) 347-4010 FAX: (804) 275-4907

ONLINE CLIENT PORTAL AVAILABLE FOR ANALYSIS RESULTS AT: www.leadlab.com

~For Lab Use Only~  
Please send this kit to:  
2 Saber Way  
Ward Hill, MA 01835-8000

Company Name: Environmental Inspection Services

Address: 11981 Farrow Road Astoria, Oregon 97103

Phone: (503) 326-6758 Email: Charles Spear@ghos.com Fax:

Testing Address: Wasco County Hwy 5-10 City/State: Silver Lake, OR 97638

Collected By: Charles Spear Date: 8/24/18 Certification #:

Relinquished By: Charles Spear Date: 8/27/18 Received By: Amaldeen Date: 8/30/18 4:35a

\*\*\* Failure to completely fill out the following chart with collection information for each sample may cause a 5 day delay in receiving your laboratory results. \*\*\*

Sample No.	Device Number	Radon-in-Air Start Date	Radon-in-Air Start Time	Radon-in-Air End Date	Radon-in-Air End Time	Collection Location (Basement, Family Room, Kitchen Sink, Bathroom Tub, etc.)
1	3753587	8/24/18	10:36	8-27	12:01	Attic
2	3753580	8/24/18	10:45		12:03	SNOP
3	3753577	8/24/18	10:45		12:07	SNOP
4	3753597		10:45		12:06	SNOP
5	3753604		10:45		12:08	SNOP
6	3753578		10:55		12:05	SNOP
7	3753591		10:55		12:06	SNOP
8	3753584		11:00		12:08	SNOP

Comments/Measurement Conditions:



EHS Laboratories

ENVIRONMENTAL HAZARDS SERVICES, LLC

RADONS MART

Chain-of-Custody Form

Phone: (800) 347-4010 FAX: (804) 275-4907

ONLINE CLIENT PORTAL AVAILABLE FOR ANALYSIS RESULTS AT: www.leadlab.com



18-08-04554

Due Date:

09/04/2018

(Tuesday)

AE

Company Name: Environmental Inspection Services

Account #:

Address: 11981 Fargo Road

City/State/Zip:

AORROR Oregon 97002

Phone: (503) 680-6358

Email:

Charles a Spear @ yahoo

Fax:

Testing Address

57526 Conkley St

City/State:

Skier Lake, OR 97638

Collected By:

Charles Spear

Date:

8/24/18

Certification #:

Relinquished By:

Charles Spear

Date:

8/27/18

Received By:

Michelle

Date:

8/30/18 4:35 PM

\*\*\* Failure to completely fill out the following chart with collection information for each sample may cause a 5 day delay in receiving your laboratory results. \*\*\*

Sample No.	Device Number	Radon-in-Air Start Date	Radon-in-Air Start Time	Radon-in-Air End Date	Radon-in-Air End Time	Collection Location (Basement, Family Room, Kitchen Sink, Bathroom Tub, etc.)
1	3753572	8/24/18	11:05	8-27	12:01	LEARNING
2	3753569		11:10		11:58	HOMEEG
3	3753570		11:10		11:58	HOMEEG
4	3753567		11:15		11:57	KITCHEN
5	3753401		11:15		11:55	MOTHER
6	3753602		11:20		11:54	CORRIDOR LAB
7	3753573		11:20		11:34	SOCIAL SUITE
8	3753586		11:25	8-27	11:26	SINK

Comments/Measurement Conditions:



Laboratories™

ENVIRONMENTAL HAZARDS SERVICES, LLC

**RADONS MART**

Chain-of-Custody Form

Phone: (800) 347-4010 FAX: (804) 275-4907

ONLINE CLIENT PORTAL AVAILABLE FOR ANALYSIS RESULTS AT: www.leadlab.com

4554  
~For Lab Use Only~  
Please send this kit to:  
2 Saber Way  
Ward Hill, MA 01835-8000

Company Name:

Environmental Inspection Services

Account #:

Address:

11981 Farago Road

City/State/Zip:

Astoria, Oregon 97002

Phone:

(503) 680-6338

Email:

charles.spear@qghos.com

Testing Address

57566 Confy Hwy 5-10.

City/State:

Star Lake, Oregon 97638

Collected By:

Charles Spear

Date:

8/24/18

Certification #:

Relinquished By:

Charles Spear

Date:

8/27/18

Received By:

Shirley

Date:

8/30/18 4:35p

\*\*\*Failure to completely fill out the following chart with collection information for each sample may cause a 5 day delay in receiving your laboratory results.\*\*\*

Sample No.	Device Number	Radon-in-Air Start Date	Radon-in-Air Start Time	Radon-in-Air End Date	Radon-in-Air End Time	Collection Location (Basement, Family Room, Kitchen Sink, Bathroom Tub, etc.)
1	3753576	8/24	10:45	8/27	11:04	OFFICE
2	3753565		10:50		11:04	OFFICE
3	3753574		10:52		11:06	SUPER OFFICE
4	3753595		10:53		11:06	HALLWAY OFFICE
5	3753575		10:56		11:06	NEUMANN CLASS
6	3753579		10:58		11:08	FACULTY
7	3753598		10:59		11:09	FACULTY
8	3753581		11:01		11:45	CDMPUTER
	3753603		11:32		11:48	ANNEX

Comments/Measurement Conditions:

**APPENDIX 4.0**  
**RADON REGULATION**



# A Citizen's Guide to Radon

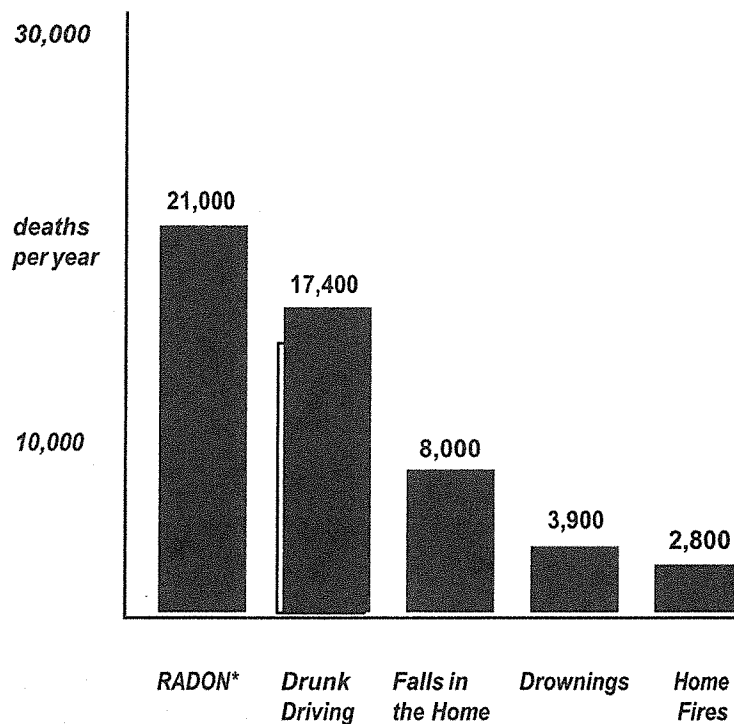
The Guide to Protecting  
Yourself and Your Family from  
Radon



## EPA Recommends:

- ▼ **Test your home for radon—it's easy and inexpensive.**
- ▼ **Fix your home if your radon level is 4 picocuries per liter (pCi/L) or higher.**
- ▼ **Radon levels less than 4 pCi/L still pose a risk, and in many cases may be reduced.**

**Radon is estimated to cause thousands of lung cancer deaths in the U.S. each year.**



\*Radon is estimated to cause about 21,000 lung cancer deaths per year, according to EPA's 2003 Assessment of Risks from Radon in Homes (EPA 402-R-03-003). The numbers of deaths from other causes are taken from the Centers for Disease Control and Prevention's 1999-2001 National Center for Injury Prevention and Control Report and 2002 National Safety Council Reports.

# OVERVIEW

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## ***Radon is a cancer-causing, radioactive gas.***

You can't see radon. And you can't smell it or taste it. But it may be a problem in your home.

Radon is estimated to cause many thousands of deaths each year. That's because when you breathe air containing radon, you can get lung cancer. In fact, the Surgeon General has warned that radon is the second leading cause of lung cancer in the United States today. Only smoking causes more lung cancer deaths. **If you smoke and your home has high radon levels, your risk of lung cancer is especially high.**

## ***Radon can be found all over the U.S.***

Radon comes from the natural (radioactive) breakdown of uranium in soil, rock and water and gets into the air you breathe. Radon can be found all over the U.S. It can get into any type of building—homes, offices, and schools—and result in a high indoor radon level. But you and your family are most likely to get your greatest exposure at home, where you spend most of your time.

## ***You should test for radon.***

Testing is the only way to know if you and your family are at risk from radon. EPA and the Surgeon General recommend testing all homes below the third floor for radon. EPA also recommends testing in schools.

Testing is inexpensive and easy—it should only take a few minutes of your time. Millions of Americans have already tested their homes for radon (see page 5).

## ***You can fix a radon problem.***

Radon reduction systems work and they are not too costly. Some radon reduction systems can reduce radon levels in your home by up to 99%. Even very high levels can be reduced to acceptable levels.

## ***New homes can be built with radon-resistant features.***

Radon-resistant construction techniques can be effective in preventing radon entry. When installed properly and completely, these simple and inexpensive techniques can help reduce indoor radon levels in homes. In addition, installing them at the time of construction makes it easier and less expensive to reduce radon levels further if these passive techniques don't reduce radon levels to below 4 pCi/L. **Every new home should be tested after occupancy, even if it was built radon-resistant.** If radon levels are still in excess of 4 pCi/L, the passive system should be activated by having a qualified mitigator install a vent fan. For more explanation of radon resistant construction techniques, refer to EPA publication, *Building Radon Out: A Step-by-Step Guide on How to Build Radon-Resistant Homes* (see page 15).



## HOW DOES RADON GET INTO YOUR HOME?

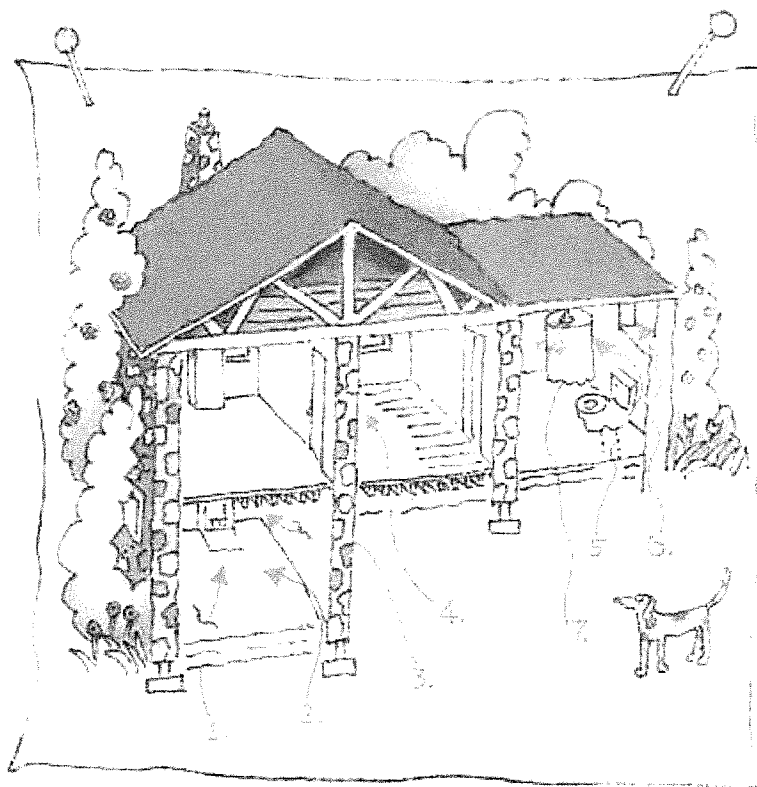
**Any home may have a radon problem.**

Radon is a radioactive gas. It comes from the natural decay of uranium that is found in nearly all soils. It typically moves up through the ground to the air above and into your home through cracks and other holes in the foundation. Your home traps radon inside, where it can build up. Any home may have a radon problem. This means new and old homes, well-sealed and drafty homes, and homes with or without basements.

Radon from soil gas is the main cause of radon problems. Sometimes radon enters the home through well water (see page 8). In a small number of homes, the building materials can give off radon, too. However, building

### **RADON GETS IN THROUGH:**

1. Cracks in solid floors.
2. Construction joints.
3. Cracks in walls.
4. Gaps in suspended floors.
5. Gaps around service pipes.
6. Cavities inside walls.
7. The water supply.



materials rarely cause radon problems by themselves.

Nearly 1 out of every 15 homes in the U.S. is estimated to have elevated radon levels. Elevated levels of radon gas have been found in homes in your state. Contact your state radon office (<https://www.epa.gov/radon/find-information-about-local-radon-zones-and-state-contact-information>) for general information about radon in your area. While radon problems may be more common in some areas, any home may have a problem. The only way to know about your home is to test.

Radon can also be a problem in schools and workplaces. Ask your state radon office ([www.epa.gov/radon/wherelive.html](http://www.epa.gov/radon/wherelive.html)) about radon problems in schools, daycare and childcare facilities, and workplaces in your area (also visit <https://www.epa.gov/radon>).

# HOW TO TEST YOUR HOME

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You can't see radon, but it's not hard to find out if you have a radon problem in your home. All you need to do is test for radon. Testing is easy and should only take a few minutes of your time.

The amount of radon in the air is measured in "picocuries per liter of air," or "pCi/L." There are many kinds of low-cost "do it yourself" radon test kits you can get through the mail and in some hardware stores and other retail outlets. If you prefer, or if you are buying or selling a home, you can hire a qualified tester to do the testing for you. You should first contact your state radon office about obtaining a list of qualified testers. You can also contact a private radon proficiency program for lists of privately certified radon professionals serving your area. For links and more information, visit <https://www.epa.gov/radon/find-radon-test-kit-or-measurement-and-mitigation-professional>.

## ***There are Two General Ways to Test for Radon:***

### **SHORT-TERM TESTING:**

*The quickest way to test is with short-term tests. Short-term tests remain in your home for two days to 90 days, depending on the device. "Charcoal canisters," "alpha track," "electret ion chamber," "continuous monitors," and "charcoal liquid scintillation" detectors are most commonly used for short-term testing. Because radon levels tend to vary from day to day and season to season, a short-term test is less likely than a long-term test to tell you your year-round average radon level. If you need results quickly, however, a short-term test followed by a second short-term test may be used to decide whether to fix your home (see also page 7 under Home Sales).*

### **LONG-TERM TESTING:**

*Long-term tests remain in your home for more than 90 days. "Alpha track" and "electret" detectors are commonly used for this type of testing. A long-term test will give you a reading that is more likely to tell you your home's year-round average radon level than a short-term test.*

## ***How To Use a Test Kit:***

Follow the instructions that come with your test kit. If you are doing a short-term test, close your windows and outside doors and keep them closed as much as possible during the test. Heating and air conditioning system fans that re-circulate air may be operated. Do not operate fans or other machines which bring in air from outside. Fans that are part of a radon-reduction system or small exhaust fans operating only for short periods of time may run during the test. If you are doing a short-term test lasting just 2 or 3 days, be sure to close your windows and outside doors at least 12 hours **before** beginning the test, too. You should not conduct

***Testing is easy  
and should only  
take a few  
minutes of  
your time.***

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## HOW TO TEST YOUR HOME *continued*

short-term tests lasting just 2 or 3 days during unusually severe storms or periods of unusually high winds. The test kit should be placed in the lowest lived-in level of the home (for example, the basement if it is frequently used, otherwise the first floor). It should be put in a room that is used regularly (like a living room, playroom, den, or bedroom) but **not** your kitchen or bathroom. Place the kit at least 20 inches above the floor in a location where it won't be disturbed—away from drafts, high heat, high humidity, and exterior walls. Leave the kit in place for as long as the package says. Once you've finished the test, reseal the package and send it to the lab specified on the package right away for analysis. You should receive your test results within a few weeks.

### ***EPA Recommends the Following Testing Steps:***

**Step 1.** *Take a short-term test. If your result is 4 pCi/L or higher, take a follow-up test (Step 2) to be sure.*

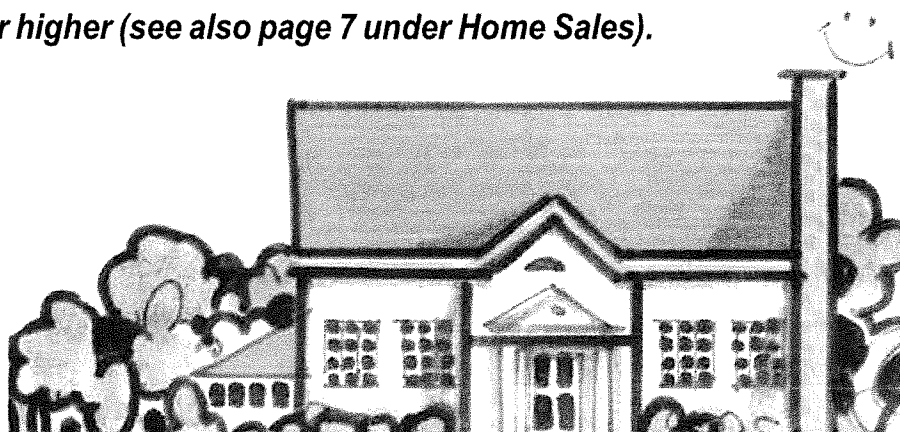
**Step 2.** *Follow up with either a long-term test or a second short-term test:*

- *For a better understanding of your year-round average radon level, take a long-term test.*
- *If you need results quickly, take a second short-term test.*

*The higher your initial short-term test result, the more certain you can be that you should take a short-term rather than a long-term follow up test. If your first short-term test result is more than twice EPA's 4 pCi/L action level, you should take a second short-term test immediately.*

**Step 3.** • *If you followed up with a long-term test: Fix your home if your long-term test result is 4 pCi/L or more.*

- *If you followed up with a second short-term test: The higher your short-term results, the more certain you can be that you should fix your home. Consider fixing your home if the average of your first and second test is 4 pCi/L or higher (see also page 7 under Home Sales).*



## WHAT YOUR TEST RESULTS MEAN

The average indoor radon level is estimated to be about 1.3 pCi/L, and about 0.4 pCi/L of radon is normally found in the outside air. The U.S. Congress has set a long-term goal that indoor radon levels be no more than outdoor levels. While this goal is not yet technologically achievable in all cases, most homes today *can* be reduced to 2 pCi/L or below.

Sometimes short-term tests are less definitive about whether or not your home is above 4 pCi/L. This can happen when your results are close to 4 pCi/L. For example, if the average of your two short-term test results is 4.1 pCi/L, there is about a 50% chance that your year-round average is somewhat below 4 pCi/L. However, EPA believes that any radon exposure carries some risk—no level of radon is safe. Even radon levels below 4 pCi/L pose some risk, and you can reduce your risk of lung cancer by lowering your radon level.

If your living patterns change and you begin occupying a lower level of your home (such as a basement) you should retest your home on that level.

Even if your test result is below 4 pCi/L, you may want to test again sometime in the future.

***Test your home now and save your results. If you find high radon levels, fix your home before you decide to sell it.***

### **RADON AND HOME SALES**

*More and more, home buyers and renters are asking about radon levels before they buy or rent a home. Because real estate sales happen quickly, there is often little time to deal with radon and other issues. The best thing to do is to test for radon NOW and save the results in case the buyer is interested in them. Fix a problem if it exists so it won't complicate your home sale. If you are planning to move, review EPA's pamphlet "Home Buyer's and Seller's Guide to Radon," which addresses some common questions (<https://www.epa.gov/radon/home-buyers-and-sellers-guide-radon>). You can also use the results of two short-term tests done side-by-side (four inches apart) to decide whether to fix your home.*

*During home sales:*

- *Buyers often ask if a home has been tested, and if elevated levels were reduced.*
- *Buyers frequently want tests made by someone who is not involved in the home sale. Your state radon office (<https://www.epa.gov/radon/find-information-about-local-radon-zones-and-state-contact-information>) can assist you in identifying a qualified tester.*
- *Buyers might want to know the radon levels in areas of the home (like a basement they plan to finish that the seller might not otherwise test).*

*Today many homes are built to help prevent radon from coming in. Building codes in your state or local area may require these radon-resistant construction features. If you are buying or renting a new home, ask the owner or builder if it has radon-resistant features. The EPA recommends building new homes with radon-resistant features in high radon potential (Zone 1) areas. Even if built radon-resistant, every new home should be tested for radon after occupancy. If you have a test result of 4 pCi/L or more, consult a qualified mitigator (<http://www.epa.gov/radon/find-radon-test-kit-or-measurement-and-mitigation-professional#who>) to estimate the cost of upgrading to an active system by adding a vent fan to reduce the radon level. In an existing home, the cost to install a radon mitigation system is about the same as for other common home repairs.*

**APPENDIX 5.0**  
**CONSULTANT RESUME**

## **RESUME**

**CHARLES ARTHUR SPEAR**

**CERTIFIED ENVIRONMENTAL CONSULTANT ( CEC)  
ENVIRONMENTAL ASSESSMENT ASSOCIATION**

**REGISTERED ENVIRONMENTAL ASSESSOR  
(Former) REA - 01241**

**AHERA INSPECTOR (EPA CERTIFICATION NO. IR-18-2439A**

**CERTIFIED ENVIRONMENTAL INSPECTOR  
CEI - 10364**

### **Professional Background**

Charles A. Spear, President and founder of Environmental Inspection Services has over 30 years technical experience ranging from facility food technologist to hazardous waste site remediation at Federal SUPERFUND sites from California to Maryland. Mr. Spear has successfully performed over 3,000 Phase One, Phase Two, and Phase Three Environmental Site Assessment inspections on properties from California to Alaska and east to Maryland. Mr. Spear has managed such projects as spilled mustard gas and organophosphate demilitarization and remediation as a decontamination sergeant of the U.S. Army Chemical Corps Technical Escort Unit Drill & Transfer Unit at Umatilla Army Depot and removal of leaking solvent underground storage tanks in California and Oregon. Additional experience included supervision as a USARMY NBC Specialist of focused remediation at the Federal Superfund site known as Aberdeen Proving Grounds, Maryland (Michaelsville Landfill). EIS does not conduct or perform geological work. Geologic work is referred to a state registered geologist.

Specifically, Mr. Spear has worked with clients such as: Housing & Urban Development, the International Fabric Care Industry (IFI), the U.S. Environmental Protection Agency, The U.S. Department of Defense, The Oregon Department of Environmental Quality (ODEQ), The Oregon Department of Forestry, INTEL, Sun Microsystems, IBM, Rohm & Haas, General Electric, AT&T, Texaco, Unocal, BP, Lockheed Missile and Space Center, FMC Corporation, Oregon Department of Fish & Wildlife, Washington Department of Fish & Wildlife, City of Beaverton, City of Hillsboro, City of Corvallis, Housing Authority of Portland, Northwest Oregon Housing Authority, Washington County Department of Housing, Housing & Urban Development, numerous lenders and mortgage companies, many private development and site remedial site projects, and many attorneys and investors.

Mr. Spear managed complex solvent tank farm removals at Xidex Corporation in Sunnyvale, California and was the site cleanup manager at the Rose City Plating Site currently developed as the Oregon Convention Center. Mr. Spear is a certified hazardous waste professional who has coupled military experience as a Nuclear, Biological and Chemical Specialist (U.S. Army MOS 54E20) with experience as a professional industrial and process research engineer in both the corrugated paper and petroleum industries.

Mr. Spear has managed food industry quality control as an inplant food technologist and prepared cost reduction programs as a corrugated boxboard industrial engineer in Dallas, Texas. He is currently registered with the states of California, Washington, and Oregon and is an active member of the national respected Environmental Assessment Association. Due diligence projects have been performed throughout the United States from Fairbanks, Alaska to San Diego, California.

Professional experience includes the following:

### **Professional Experience**

- \* Dry Cleaner Inspections
- \* Environmental Consultation
- \* Waste Reduction Audits
- \* Regulatory Compliance Audits
- \* Drum Yard Clearances
- \* Tank Farm Removals/Replacements
- \* Lab Packaging & Supervision
- \* Environmental Site Assessments
- \* Superfund Site Remediation
- \* Hazardous Waste site Project Design & Management
- \* Habitat/Wetlands Restoration
- \* AHERA asbestos inspections for school districts
- \* Landfill Remediation
- \* Agricultural assessments
- \* Indoor air quality inspections

### **Professional Employment/Consultation**

- \* C.F.S. Continental Coffee, Inc., Food technologist, Chicago, Illinois
- \* Holiday Industries, Research Engineer, Grand Prairie, Texas
- \* Alton Packaging Corporation, Industrial Engineer, Dallas, Texas
- \* U.S. Army Chemical Corps., Nuclear, Biological, Chemical Specialist - Special assignment - Umatilla Army Depot (DATS)  
Oregon and permanent assignment U.S. Army Chemical Corps. Technical Escort Unit in Edgewood, Maryland

- \* Rollins Environmental Services, Remedial Project Manager
- \* Crown Environmental Services, Technical Director, Redmond, California
- \* Dames & Moore, Remedial design Engineer, Portland, Oregon
- \* Pegasus Environmental Management Services, Director of Technical Services
- \* Pacific Tank & Construction, Manager of Estimation, Portland, Oregon
- \* Enviro-Logic Inc., Director of Environmental Site Assessment Division
- \* Environmental Inspection Services Founder / President

### **Professional Education**

- \* American Standard for Testing & Materials ASTM E1527-13 Training
- \* Bachelor of Science, Chemistry, Northeastern Illinois University, 1978
- \* U.S. Army Chemical School, Ft. McClellan, Alabama, 1983
- \* U.S. Army Technical Escort Unit, Accident / Incident Response Training Center 1983
- \* Registered Environmental Assessor REA - 01241 (Former classification)
- \* Certified environmental Inspector CEI - 10364
- \* AHERA Certified Asbestos Inspector IR-17-2439A
- \* ODEQ Soil Matrix Assessor & UST Decommission Supervisor ID No. 10305
- \* Washington DOE Registered Environmental Assessor
- \* Wetland Specialist - Training Wetlands Institute 1997
- \* EPA / HUD Lead-Based Paint (LBP) Certified Inspector & Risk Assessor

### **Additional Education**

- \* Joint Military Material Packaging & Transportation
- \* Asbestos Abatement Seminar attendance 1987
- \* Thin Layer Chromatography, 1989
- \* Oregon Registered Underground storage Tank Supervisor, 1998
- \* Oregon Registered Soil Matrix Assessor, 1998
- \* Washington Registered Assessor, 1991
- \* Washington Registered Underground Storage Tank Supervisor, 1991
- \* Wetland Training Institute Delineation Course Study University of Portland March 1997
- \* 40-Hour HAZMAT Certified
- \* AHERA-Certified Inspector



## **Special Skills**

- \* Facility Environmental Compliance Audits
- \* ASTM standard Environmental Site Assessments
- \* Computer Programming
- \* Organic surfactant chemical synthesis and analysis
- \* Hazardous Waste Site remediation/ estimating/ standards development
- \* Design of filtration systems, batch and continuous process optimization studies
- \* QA/QC Procedures
- \* SUPERFUND Site Management
- \* Industrial/ Research Engineering
- \* Hazardous Waste Site Remediation/ Consultation
- \* Wetlands Delineation and Habitat Restoration

## **Certification**

- \* U.S. Army MOS 54E20 - U.S. Army Chemical Corps.
- \* International Fire Code Institute (IFCI) Certified UST Supervisor
- \* International Fire Code Institute (IFCI) Certified Soil Matrix Assessor
- \* Certified Hazardous Waste Manager
- \* 40-hour OSHA Training
- \* 40-hour OSHA Supervisor Training
- \* Registered Environmental Assessor (DOE)
- \* DEQ Registered UST Supervisor
- \* DEQ Registered Soil Matrix Assessor
- \* Resolution Trust Corporation (RTC) approved Environmental Assessor
- \* California Registered Environmental Assessor (REA-01241)- program discontinued
- \* Department of Ecology (DOE) Registered Environmental Assessor
- \* Environmental Assessment Association, Certified Environmental Inspector & Transaction Specialist (CEI-10364)
- \* Environmental Assessment Association, Certified Environmental Consultant (CEC)
- \* AHERA Certified Asbestos Inspector
- \* Wetland Delineator Graduate Wetland Training Institute, University of Portland 1997
- \* EPA / HUD LBP Inspector & Risk Assessor
- \* ASTM Training class, May, 2004



