



January 13, 2017

Joe Crelier  
Director of Risk Management  
Portland Public Schools  
501 N Dixon Street  
Portland, Oregon 97227

Via email: jcrelier@pps.net

Regarding: Variance (+/- Values) in Radon Results  
Short Term Radon Testing at Portland Public schools  
Portland, Oregon  
PBS Project No. 06500.618, Phase 0001

Dear Mr. Crelier:

For short-term radon testing at Portland Public Schools, PBS Engineering and Environmental Inc. (PBS) has been utilizing Air Chek Inc. ProChek activated charcoal radon test kits. Air Chek, Inc. is also responsible for analysis of these test kits.

Included in the analysis reports is a column listing variance with a plus or minus value (+/-). Below is an explanation of variance from the Frequently Asked Questions (FAQ) page on the Radon-Pro.com website, the professional testing companies' portal for Air Chek Inc.\*

**Q. What does the  $\pm$  mean after my test result?**

- A. Measuring radioactivity is almost like measuring something while it is moving. Since it is impossible to get an absolute result, there is degree of error associated with all measurements. At Air Chek, we call this the sample variance. The variance (in terms of +/- pCi/L) provides the degree of error in a particular sample. For the most part, the variance is proportionate to the amount of radon in the sample, the amount of outside radiation from other sources making it into the counting equipment, and the amount of time that has elapsed from the end of the sampling period to analysis. For example, a result 4.0 +/- 0.4 pCi/L calculated 4 days after the end of test means that the calculated value was indeed 4.0, but because of known uncertainties, the sample could have just as well been anywhere between 3.6 and 4.4 pCi/L. However, if the same sample would have taken 8 days to arrive, the variance may well have been 0.8 pCi/L. Although we are required to report this value as part of our laboratory certification agreement, you will probably find it confusing when trying to explain it to your clients. Thus, we urge you to base your recommendations on the actual pCi/L value reported (i.e., 4.0 pCi/L) and not get into the discussions from real estate clients that may try to turn the 4.0 pCi/L value into a 3.6 by only subtracting the 0.4pCi/L variance.

I understand that this variance value may make it difficult to interpret results, so I hope this guidance from the test kit manufacturer and analysis laboratory helps clarify any confusion.

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\* This FAQ web page is not in the public area of Radon-Pro.com's website and requires a testing company login.

Please feel free to contact me at 503.417.7694 or [chris.boyce@pbsenv.com](mailto:chris.boyce@pbsenv.com) with any questions or comments.

Sincerely,

A handwritten signature in black ink, appearing to read "Chris Boyce". The signature is fluid and cursive, with a long horizontal stroke at the end.

Chris Boyce  
Project Manager

CB:ikn