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WATER SAMPLE PROCUREMENT

Water Sampling Equipment Requirements

For the measurement technique described below, the water sample must be placed in a glass or high density plastic wide mouth container with a lid that provides a good seal. The container must be a minimum of 250 ml and preferably 500 ml in size. If there is more than one sampling jar, each jar must be uniquely identified. e.g., With a number.

In addition, electrical tape or equivalent is required to provide additional sealing of the lid to the container.

Water Sampling Location

The water sample must be taken from a point between the well and before any water conditioning devices such as sulphur removers, water softeners, etc.

Ensure that there is a sink or other large container such as a pail available at the water sampling location.

Water Sample Procurement

NOTE

Radon is easily removed from water by agitating the water. In order to obtain an accurate measurement, extreme care must be exercised to minimize the agitation of the water from which the sample is procured.

NOTE

Even when the sample is sealed in the container, the container should be handled with care to minimum the shaking of the container.

There are 2 sets of instructions for procuring the water sample. The first is for obtaining samples from sinks or equivalent. The second is for obtaining samples when a large container must be used because there is no sink or equivalent.

These instructions provide the important steps that must be followed to ensure that an appropriate sample is obtained. However, due to the wide variety of potential scenarios that are

available, the sampling steps should be modified as appropriate for the particular scenario that is encountered.

Sink or Equivalent

1) If supplied, remove the aerator from the faucet.
2) Ensure that the drain is open.
3) Provide a method to ensure that the water will not splash into the sink. e.g., A hose that goes to the bottom of the sink, a stick from the faucet to the bottom of the sink, etc.
4) Slowly turn on the water to obtain a slow, steady flow of water that does not splash.
5) After 5 minutes, close the drain and allow the basin/container to fill with water sufficiently to allow complete immersion of the sampling jar. When filled to an appropriate level, turn the water off.
6) Select an unused sampling jar.
7) Remove the lid and slowly place the jar and lid under the water in such a manner that the water is not disturbed very much.
8) Ensuring that there are no air bubbles trapped inside the sampling jar or lid, tightly screw the lid of the sampling jar onto the sampling jar.
9) Note the time that the lid was placed on the sampling jar.
10) Remove the sampling jar from the water and examine it for air bubbles trapped inside the jar. If any are noted, empty the jar in another sink, and repeat the sampling.
11) Seal the jar lid to the jar with electrical tape.

Large Container

1) If supplied, remove the aerator from the faucet.
2) Provide a method to ensure that the water will not splash into the container. e.g., A hose that goes to the bottom of the container, a stick from the faucet to the bottom of the container, etc.
3) Slowly turn on the water to obtain a slow, steady flow of water that does not splash.
4) After 5 minutes, turn off the water.
5) If necessary, remove the item used to prevent splashing, place the large container under the faucet, replace the item used to prevent splashing, slowly turn on the water to obtain a slow, steady flow of water that does not splash, and allow the container to fill with water sufficiently to allow complete immersion of the sampling jar. When filled to an appropriate level, turn the water off.
6) Select an unused sampling jar.
7) Remove the lid and slowly place the jar and lid under the water in such a manner that the water is not disturbed very much.
8) Ensuring that there are no air bubbles trapped inside the sampling jar or lid, tightly screw the lid of the sampling jar onto the sampling jar.
9) Note the time that the lid was placed on the sampling jar.
10) Remove the sampling jar from the water and examine it for air bubbles trapped inside the jar. If any are noted, empty the jar, and repeat the sampling.
11) Seal the jar lid to the jar with electrical tape.

Note and record the following information for the sample.

- The sample jar unique identification.
- The name of the person who took the sample.
- Information on the address where the sample was procured. E.g., Business or homeowner name, address, etc.
- The location in the building where the sample was procured. e.g., Kitchen sink, upstairs bathroom sink, outdoor faucet, etc.
- The date and time that the lid was placed on the sample jar.
- Any additional notes and comments that would assist with the evaluation of the measurement.

This information must be submitted to the test lab with the sample.

Additional Water Samples

Additional water samples may be obtained from the same location, other locations within the same building, or at other buildings, as desired, by following the same processes described above.

Water Sample Delivery

The radon in the water sample decays within 4 days. As a result, the radon sample must be removed from the water sample and measured within 4 days in order to obtain an accurate measurement.

In order to meet this criteria and allow time for the lab to process the water sample, the water samples must be delivered to the lab for measurement within 72 hours from the time that the lid was placed on the sample jar. Of course, this means that the timing of the sample procurement must include the lab's normal working hours.

NOTE

Measurements can be made after the 4 days but the measurements will not necessarily reflect the actual radon levels in the water. They could provide a measurement within an acceptable limit when, in fact, the levels are actually above the acceptable limit.

RADON IN WATER SAMPLE MEASUREMENT

Pylon has developed an unique accessory called the water degassing system. It is very efficient at extracting radon from a water sample into one of Pylon's detector active Lucas type cells without the use of chemicals, etc. Once extracted, the radon in the cell can be measured on Pylon's monitors.

Radon Extraction

The following provides a brief overview of the radon extraction from the water sample to place it in an active cell using the Pylon water degassing system.

1) The active cell is prepared by measuring the system background.
2) The water degassing system is prepared for extracting the radon gas. e.g., Closing all valves, etc.
2) The active cell is connected to the appropriate connection on the water degassing system.
3) The cell and extraction plumbing of the water degassing system are evacuated to 29 inches of mercury (vacuum) using a vacuum pump.
4) A precise amount of the water sample is carefully placed in the water degassing system graduated cylinder. i.e., Minimal water agitation, etc.
5) The graduated cylinder and tubing are appropriately connected to the water degassing system to provide an air tight seal.
6) The appropriate control valves on the water degassing system are slowly opened to allow air to slowly bubble through the water sample. This extracts the radon from the water sample where it is sucked into the active cell.
7) Once complete, the time is noted, the active cell is removed from the water degassing system, and the water degassing system is prepared for the next sample or storage.

Radon Measurement

1) The active cell with the radon sample is allowed to sit for a minimum of 3.5 hours after the radon was extracted from the water to allow for ingrowth.
2) The active cell is placed on the radon monitor and the measurement is made. This normally involves counting for 6 times 2 minute intervals.
3) The count data is obtained from the monitor and the radon concentration is calculated in Bq/l using the standard formula that is provided with the water degassing system.
4) Once complete, the active cell is flushed to remove the radon sample and the cell is prepared for storage. It must be stored for a minimum of 24 hours before the next use.
5) The results are reported, as appropriate.