

## Abstract

### Release of Radon Gas by Aeration Columns in Fish Hatcheries

by William P. Dwyer, and Jon V. Gravning, USFWS

The high levels of radon gas measured in many hatchery buildings is in most cases, due to aeration of the water used in rearing facilities. By developing new and more effective methods of degassing and aerating we have created an new, but not insurmountable, problem. Radon gas, a radioactive byproduct of uranium decay, is found naturally in ground water in many areas of the country. When this ground water is aerated the radon is released into the atmosphere. Exposure to high levels of radon can cause increased risk of lung cancer or other lung problems.

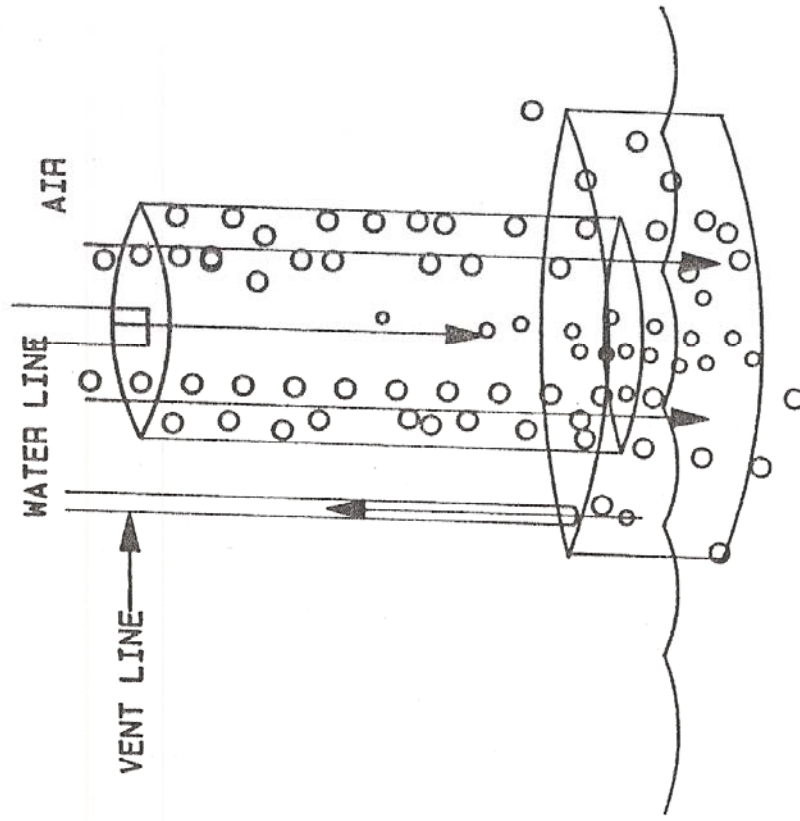
Radon concentrations in a hatchery building can be reduced by ventilation. Obviously this is not the most energy efficient method since large volumes of outside air are needed and heated inside air is lost. A more efficient method would be to collect the gasses given off from the column and vent them to the outside. This would require less air exchange to get rid of the radon.

This was tested at the Ennis National Fish Hatchery with a group of tanks. An inverted 14" x 18" soft plastic tub with a hole cut in it was slipped up over each packed column. The hole was cut slightly less than the column diameter so it would be self sealing. A vent hole was cut and a 1 inch pvc fitting inserted. A 1 inch pvc pipe then vented the gas to a 2 inch pvc pipe which was extended through the wall to the outside. We found that up to 4 tanks flowing 60 gpm could be vented through one 2 inch pipe to the outside without creating back pressure.

A radon monitor was used to measure the radon content of the air coming from one of the vents. After 24 hours the monitor averaged 428 pCi/L, thus demonstrating that a significant amount of radon was being liberated by the column, and could be vented to the outside using this system.

Thirty-eight tanks were retrofitted with passive off-gas collectors. Cost of materials was about \$600. After installation the concentration of radon in the tank room dropped from 250 pCi/L to about 30 pCi/L.

COLUMN WITH OFF GAS COLLECTOR



This appears to be a simple inexpensive method to deal with a dangerous health problem.