

Mission:

To protect, promote & improve the health of all people in Florida through integrated state, county & community efforts.



Rick Scott
Governor

Celeste Philip, MD, MPH
Surgeon General and Secretary

Vision: To be the **Healthiest State** in the Nation

Toxicology Consult

Date: July 6, 2018

From: Kendra F. Goff, PhD, DABT, CPM, CEHP, State Toxicologist & Chief of Bureau for Environmental Health

Requested by: Florida Department of Environmental Protection

PURPOSE:

The Florida Department of Health (DOH) received a request from the Florida Department of Environmental Protection (DEP) to evaluate groundwater data that were collected as part of DEP's area-wide groundwater surveillance study in the Bayou Texar area of Escambia County. The request focuses on radium measured in groundwater and its safety/risk to use for irrigation.

METHODS:

Radium-226+228 data from groundwater samples collected at irrigation wells located in the Bayou Texar area of Escambia County were provided by DEP. DOH investigated the current drinking water standards to determine the health risk from this exposure. No current standards exist for irrigation water.

RESULTS and FINDINGS:

The radium-226+228 levels in 9 of the 20 surveyed irrigation wells (range of 5.13 pCi/L to 7.21 pCi/L – picocuries per liter) are slightly above the EPA defined drinking water standard of 5 pCi/L. A drinking water standard assumes that a person's daily water consumption could occur at or below the standard for a lifetime and be unlikely to cause a health effect. Since irrigation water is not the direct or main source of daily water consumption but rather a small source through the sprinkling of edible foods, the probability of risk from this exposure is extremely low. In the unlikely event that a person's entire vegetable diet is irrigated with water from the surveyed Bayou Texar area, the risk from ingesting the small amounts water which attach to edible foods from this area is minimal.

Other than ingestion, DOH also considered inhalation and dermal contact exposure routes, however, these pathways were eliminated for further investigations. For radium-226+228, there is limited dermal exposure because most emitted particles do not pass through the skin. Inhalation exposure routes are also very limited since emitted particles do not vaporize as they are non-volatile.

Radium is a naturally occurring radioactive metal which can exist in several forms. In the environment, it is formed by the decay of uranium and thorium. Radium has been found at very low levels in soil, water, rocks, coal, plants, and food. The most common types of radium are radium-226 and radium-228. Radium can decay into radon gas, which could cause lung cancer. For more information about radon, please visit: <http://www.floridahealth.gov/environmental-health/radon/index.html> and/or call 850-245-4288.

Florida Department of Health

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Exposure to radium has the potential to cause harmful health effects to humans. A few of these effects include anemia, cataracts, fractured teeth, cancer, and even death. The relationship between the amount of radium exposure and the amount of time necessary to produce harmful health effects is not known. Although there is some uncertainty as to how much exposure to radium increases your chances of developing a harmful health effect, the greater the total amount of your exposure to radium, the more likely you are to develop one of these diseases.

Exposure to radium and other types of radiation can occur through normal daily activities. According to the U.S. Nuclear Regulatory Commission (NRC), most people are exposed to radiation through both food ingestion and medical procedures. In the normal diet, there are several foods which contain radiation such as bananas, carrots, white potatoes, red meat, brazil nuts, and lima beans. X-ray procedures, mammograms, and even CT scans of the body also expose people to radiation. Thus, individuals exposed to radium in the irrigation water from the Bayou Texar area, will most certainly have other additional exposures to radium and other types of radiation, separate from any radium exposure from the water in the area.

If you have any questions or comments concerning this letter, please contact Jesseka D. Forbes, in the Health Risk Assessment Program at 877-798-2772.

Sincerely,

A handwritten signature in black ink, appearing to read "Kendra F. Goff". The signature is fluid and cursive, with a large initial "K" and a stylized "G".

Kendra F. Goff, PhD, DABT, CPM, CEHP
State Toxicologist & Chief

KFG/jf/gal