



# West Lake Update

*EPA Responds to Homeowner Concerns; Provides Information About Lead-210*

December 8, 2016

## EPA to Address Concerns About Potential Contamination in Residential Home

EPA has announced that it is developing a focused residential sampling plan in Bridgeton, Mo., following alleged contamination in a Spanish Village home. This is part of an ongoing comprehensive approach by the agency to address potential environmental health concerns in the area, which has also included air monitoring, inspections at nearby landfills and industries, and the separate work at the West Lake Landfill Superfund Site.

“EPA takes the concerns of the community seriously,” said EPA Region 7 Administrator Mark Hague. “As with any decision or actions we take, we will rely on scientifically-sound data to guide our efforts. We will consider the collective data when outlining our next steps.”

If warranted, the agency will then proceed to other areas where scientific data indicate further investigation is necessary. The agency is working as quickly as possible to address community concerns, and will keep the lines of communication open with the community. In the meantime, EPA would like to provide the community with additional information regarding Lead-210.

## What is Lead-210

Lead-210 is a radioactive form of lead and is one of the last elements created by the radioactive decay of the isotope Uranium-238. Lead-210 is also a by-product of radon gas. Data from EPA’s investigation at the Bridgeton Municipal Athletic Complex (BMAC) in 2014 demonstrate that levels of Lead-210 in soils around the West Lake Landfill area are consistent with, and often lower than, naturally occurring levels found in other areas of the United States. Lead-210 can accumulate naturally in sediment and drainage areas as a result of the radon washout process, which is explained below. The levels of Lead-210 found in the areas around the West Lake Landfill are within the natural expected ranges, and no data demonstrates that radon gas from the West Lake Landfill has significantly contributed to levels of Lead-210 found locally.

In 2014, EPA found levels of Lead-210 up to 9.46 picocuries per gram (pCi/g) in a BMAC<sup>1</sup> drainage ditch. In addition, community groups and others have reported levels up to 10.9 pCi/g from the same area.



More recently an article published in the Journal of Environmental Radioactivity by Kaltofen, Alvarez, and Hixson<sup>2</sup> reported outdoor levels, such as in a drainage ditch, of Lead-210 up to 350 becquerels per kilogram (which is equivalent to 9.45 pCi/g). As stated above, these levels are consistent with naturally occurring levels of Lead-210 in the environment and in particular storm water drainage pathways, as cited in articles below. It is important to carefully consider how Lead-210 occurs in the environment and its natural variability, as well as the importance of establishing background levels on a media specific basis, before drawing conclusions about the presence of contamination.

Several research papers note a natural abundance of Lead-210 in sediments that are generally consistent with these levels:

*Article Title:* Three Decades of Dating Recent Sediments by Fallout Radionuclides: a Review

*Author:* P.G. Appleby

*Journal:* The Holocene

*Summary:* Lead-210 surface sediment in four international lakes ranged from 14 to 27 picoCuries per gram.

*Article Title:* Determination of Recent Sedimentation Rates in Lake Michigan Using Pb-210 and CS-137

*Authors:* John A. Robbins and D. N. Edgington

*Journal:* Geochimica et Cosmochimica Acta

*Summary:* Lead-210 from eight locations in Lake Michigan surface sediment ranged from 7 to 23 picoCuries per gram.

*Article Title:* 137Cs and 210Pb Transport and Geochronologies in Urbanized Reservoirs with Rapidly Increasing Sedimentation Rates

*Authors:* P.L. McCall, J.A. Robbins and G. Matisoff

*Journal:* Chemical Geology

*Summary:* Surface sediments in Lake Rockwell in northeast Ohio showed lead-210 ranged from 20 to 24 picoCuries per gram.

*Article Title:* Lead-210 Sediment Geochronology in a Changing Coastal Environment

*Authors:* Jeffrey P. Chanton, Christopher S. Martens and George W. Kipphut

*Journal:* Geochimica et Cosmochimica Acta

*Summary:* Lead-210 from surface sediments in Cape Lookout Bight on the coastal basin of the Outer Banks of North Carolina ranged from 3 to 8 picoCuries per gram.

Radon is found naturally in outdoor air, but it’s especially a concern in homes where it can be elevated above outdoor levels and is the second leading cause of cancer after smoking (<https://www.epa.gov/radon>).

Radon is a non-reactive gas produced from uranium and radium found in all native soil and rock. Eventually radon gas naturally decays into Lead-210. Rain events wash the Lead-210 out of the atmosphere where it settles in storm water drainage areas, ditches and other areas where sedimentation occurs. This natural process causes Lead-210 to accumulate in higher concentrations in sediment than in native soil.

Measuring Lead-210 levels is a common way scientists study sedimentation rates in lakes, bays, harbors and other locations (<http://www.flettresearch.ca/UnderstandingPb210.html>). Scientists also use Lead-210 in this way to study ecosystems, sediment transport, and to help schedule maintenance dredging of lakes, bays and other waterways.

In August 2014, EPA released an issue of the West Lake Update dedicated to radon and Lead-210, due to questions about the lead isotope. That issue is available on our website: [https://archive.epa.gov/region07/cleanup/west\\_lake\\_landfill/web/pdf/west-lake-update-08-27-2014.pdf](https://archive.epa.gov/region07/cleanup/west_lake_landfill/web/pdf/west-lake-update-08-27-2014.pdf)

Sources

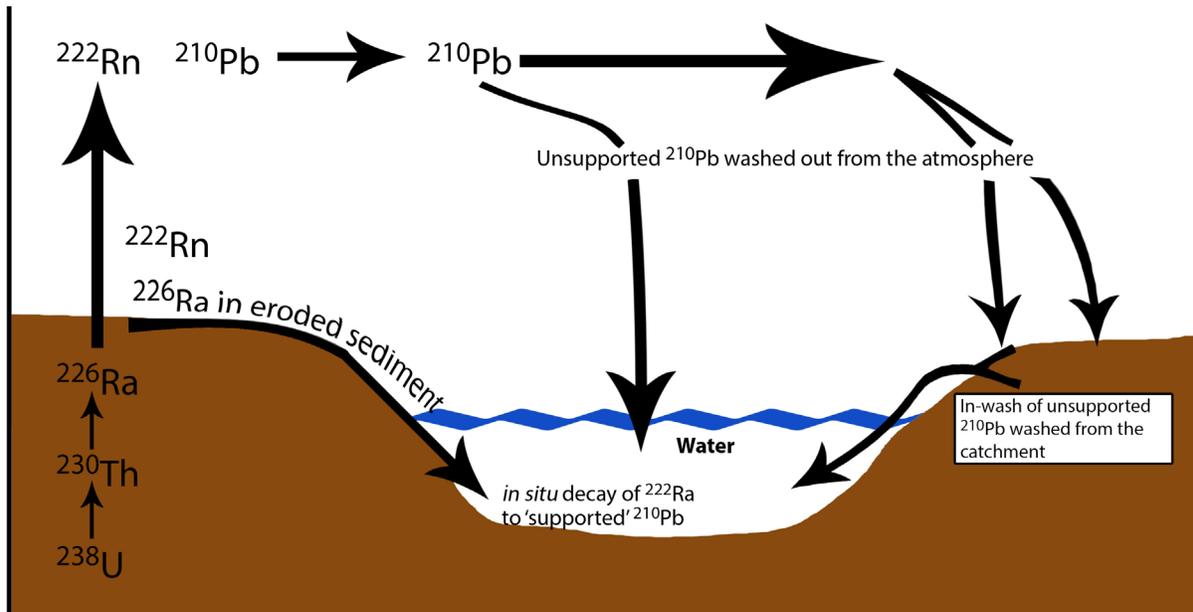
<sup>1</sup>Final Pre-CERCLIS Screening Report- Bridgeton Municipal Athletic Complex, Bridgeton, Missouri. EPA radiation assessment of the Bridgeton Municipal Athletic Complex (maximum lead-210 of 9.45 picoCuries per gram).

[https://archive.epa.gov/region07/cleanup/west\\_lake\\_landfill/web/pdf/bridgeton-final-pre-cerclis-screening-report-bmac.pdf](https://archive.epa.gov/region07/cleanup/west_lake_landfill/web/pdf/bridgeton-final-pre-cerclis-screening-report-bmac.pdf)

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<sup>2</sup>Tracking Legacy Radionuclides in St. Louis, Missouri, via Unsupported <sup>210</sup>Pb (Marco P.J. Kaltofen, Robert Alvarez, Lucas Hixson), Journal of Environmental Radioactivity; Volume 153, March 2016, Pages 104–111

<http://www.sciencedirect.com/science/article/pii/S0265931X15301685>



**Key:** 222Rn: Radon-222, 210Pb: Lead-210, 226Ra:Radium-226, 230Th: Thorium-230, 238U: Uranium-238

## Radon Emanation Pyrolysis Final Report Now Available

In July, EPA released a West Lake Update regarding the findings of the radon emanation pyrolysis study conducted by the agency. That West Lake Update summarized that laboratory tests indicate heating radiologically impacted ma-

terial (RIM) from the West Lake Landfill did not increase radon production. EPA has now released the final report of that study, which is available on our website: <https://www.epa.gov/mo/west-lake-landfill>

The July West Lake Update that summarized the findings is also available online: <https://sems-pub.epa.gov/work/07/30284673.pdf>

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