

March 4 2013

## Health Statement: Polycyclic Aromatic Hydrocarbons in Soil on Madison's East Side

In December 2013, Madison Kipp Corporation (MKC) and ARCADIS collected soil samples for polycyclic aromatic hydrocarbon (PAH) testing on the east side of Madison. These samples (called background samples) were collected from sites that were not affected by MKC activities and would show how much PAHs were coming from other sources. Public Health Madison and Dane County (PHMDC), Wisconsin Department of Natural Resources, and MKC agreed on the sampling locations and all samples were collected under the observation of PHMDC staff. The background samples were compared to samples collected in 2012 from MKC's property and adjacent residential properties to determine if PAH found on the adjacent residential properties were from MKC.

This analysis found that PAHs in background samples and on properties adjacent to MKC were from sources such as burned wood, coal, urban dust and asphalt. Samples from MKC's property had a wider variety of PAHs including those from cutting oils, coal tar and diesel sources. Also, the amount of PAH did not change significantly between samples collected on properties adjacent to MKC and samples collected further away. Although levels of some PAHs on off-site properties exceed state standards, the data shows that the source of these PAHs is from typical urban activities and not from activities at the MKC facility.

We now know that past and present urban activities have caused elevated levels of PAHs to accumulate in the soils in our community. Madison is not the only urban area to find elevated levels of PAHs in the soil and other cities have even higher levels. All of the background samples collected had one or more PAHs at levels above current state standards for residential properties. Nine of these samples exceeded the current state standards for industrial property. At these levels, long-term exposure (daily exposure over a lifetime) may increase a person's risk of cancer but is not expected to cause any immediate health effects. The additional risk of cancer is small. If a person were exposed daily over their life time, the increased risk of cancer would be less than 0.00009%.

We are exposed to PAH from many sources including charred meats, tobacco smoke, car and truck exhaust, and many other residential and occupational sources. To determine a person's risk of cancer from exposure to PAHs, all of these sources need to be considered, as well as, how often and how long a person has been exposed over their lifetime. Specific individual characteristics are another factor in a person's cancer risk, such as, family disease history, age, and tobacco use. Depending on which exposures and contributing factors apply to a given person, PAH exposure from soils in our community may be more or less important.

By decreasing exposure to PAHs in soils, potential health risks can be reduced. Exposure to PAHs in soils typically happens when a person accidentally eats contaminated soil.

To reduce the chance of accidentally eating soil:

- Wash your hands after working with soil while gardening or working in the yard,

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- Wash fruits and vegetables to remove soil on the produce,
- Wash and peel root vegetables,
- Wash your children's hands and toys after playing outdoors,
- Discourage hand to mouth activity while children are outside,
- Remove soiled shoes at the door to avoid tracking soil into the house.

Garden plants may take in a small amount of PAHs from the soil during their growth. PAHs generally remain in the root of the plant and rarely move into the stems, leaves, or fruits. Most PAHs on garden produce will be on soil stuck to the outside of the produce. To lessen the amount of PAHs in your fruits and vegetables:

- Garden in raised beds filled with clean topsoil and compost,
- Add compost to dilute the amount of PAHs in existing soils,
- Maintain correct pH and nutrient levels in the soil to reduce PAH uptake,
- Plant fruiting crops (tomatoes, squash, peppers, etc) in your garden because these take up fewer contaminants from the soil.

Exposure to PAHs in the soil through the skin or by breathing is not likely. Skin contact with PAHs can lead to problems in occupational settings when workers are handling materials with very large amounts of PAHs, such as in roofing and paving jobs. There is less of a chance for this to happen at the relatively low amounts of PAHs seen in the soil. PAHs in soil tightly bind to soil particles and get into the air attached to soil dust particles. These particles are too large to be inhaled deeply into the lungs and are normally breathed out or coughed-up before they can be absorbed.

There is much more information available on the health concerns related to PAHs. If you would like additional information please review the following links or contact Public Health Madison and Dane County at (608) 266-4821.

<http://www.dhs.wisconsin.gov/eh/chemfs/fs/pah.htm>

<http://www.epa.gov/osw/hazard/wastemin/minimize/factshts/pahs.pdf>

<http://www.atsdr.cdc.gov/tfacts69.pdf>

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