

Coal tar main source of toxicity in streams

Don Behm, Milwaukee Journal Sentinel 8:59 p.m. CT Dec. 25, 2016



(Photo: Milwaukee Journal Sentinel)

Coal-tar sealants applied to blacktop parking lots and driveways are the primary source of toxic chemicals found in the muck at the bottom of Milwaukee-area waterways, according to a study by the [U.S. Geological Survey](https://www.usgs.gov/) (<https://www.usgs.gov/>) and the [Milwaukee Metropolitan Sewerage District](http://www.mmsd.com/) (<http://www.mmsd.com/>).

Tests of muck samples collected at 40 locations along 19 creeks and rivers in the metropolitan area, and dust from six parking lots, found that coal-tar sealants contributed up to 94% of all polycyclic aromatic hydrocarbons, or PAHs, in streambed sediment, [says the study](https://www.usgs.gov/news/coal-tar-sealant-a-major-source-pah-contamination-milwaukee-streams) (<https://www.usgs.gov/news/coal-tar-sealant-a-major-source-pah-contamination-milwaukee-streams>) published last week in the journal [Environmental Toxicology and Chemistry](http://onlinelibrary.wiley.com/doi/10.1002/etc.v35.12/issue/etoc). (<http://onlinelibrary.wiley.com/doi/10.1002/etc.v35.12/issue/etoc>)

Fully 78% of the samples contained enough PAHs to be considered toxic and capable of causing adverse effects in aquatic animals, said Austin Baldwin, a USGS scientist and lead author of the study. The most toxic sediment came from Lincoln Creek and Underwood Creek.

Rain and melting snow rinse PAHs and other contaminants off the pavement and into stormwater storage basins or directly into storm sewers that carry the load to waterways.

Even before the study was published, early circulation of its findings boosted support for local restrictions or even bans on the use of coal-tar sealants and a switch to sealants containing asphalt emulsions, according to Chris Magruder, a retired MMSD scientist who is Science Advisory Committee Coordinator for the [Southeastern Wisconsin Watersheds Trust](http://www.swwtwater.org/) (<http://www.swwtwater.org/>).

Threat to aquatic life

While a 2013 USGS study determined that PAHs posed a greater risk of harm to aquatic life in the streams than other chemical pollutants, this study went beyond that in two ways, Baldwin said.

First, researchers used multiple methods for identifying separate sources of PAHs in sediment, he said. Apart from coal-tar sealants, the remainder of the PAHs came from a variety of other sources, such as coal combustion at power plants and vehicle emissions.

Second, this study exposed aquatic insects and small crustaceans to sediment taken from streams here.

"This study shows that PAHs pose a very real threat to aquatic organisms at the base of the food chain," he said. Among the adverse effects are fin erosion, liver abnormalities, cataracts and immune system damage. Exposure to the chemicals also can cause [high rates of tumors](/story/news/local/milwaukee/2016/08/26/high-rate-tumors-found-fish/89421662/) (</story/news/local/milwaukee/2016/08/26/high-rate-tumors-found-fish/89421662/>) in fish.

The study also reveals a costly consequence of regulations in Wisconsin and many other states requiring developers to excavate stormwater storage basins next to massive parking lots. PAHs cling to dirt, sand and other particles in the stormwater that settle to the bottom of the basins.

Communities in the Minneapolis-St. Paul metropolitan area estimate it will cost up to \$1 billion to dispose of PAH-contaminated sediment in the stormwater ponds when the basins are dredged for maintenance.

Coal tar, a byproduct of converting coal to coke — a solid-carbon fuel and carbon source for the steel-making industry — is a known human carcinogen. As coal is heated to produce coke, coal tar vapors are released.

Pavement sealants made with coal tar contain much higher concentrations of PAHs — up to 1,000 times more — than available substitute products made with asphalt emulsions, according to other studies.

Asphalt sealant products are known as seal coats. They are used to improve the appearance and maintain the surface of parking lots and driveways.

As of this month, MMSD no longer allows its contractors to use coal-tar sealants for sewerage district projects, officials said.

Talk of a ban

On Dec. 12, the Milwaukee County [Intergovernmental Cooperation Council](http://milwaukee.gov/ICC.htm) (<http://milwaukee.gov/ICC.htm>) of suburban city mayors and village presidents unanimously approved a resolution in support of municipal restrictions or outright bans of coal-tar products.

While no community in the county is considering such a policy at this time, the Southeastern Wisconsin Watersheds Trust intends to spark the discussion early next year with a recommendation that municipalities in the region consider bans on the use of coal-tar sealants, Magruder said.

Dane County adopted a ban on the sale and use of tar-based sealants in 2007. Prior to the ban, researchers estimated that 300,000 gallons of coal-tar sealants a year were applied to parking lots and driveways in the county.

Among retailers who sell alternative sealants with lower amounts of PAHs are Home Depot, Lowe's, Menard's, Ace Hardware and True Value, according to Magruder.

At Poblocki Paving Corp. in West Allis, the largest sealcoat application contractor in Wisconsin, the majority of asphalt maintenance work is done with asphalt emulsions rather than coal-tar sealants, company owner John Poblocki said.

Some customers prefer coal-tar products, however, because they provide a jet black appearance and last longer, Poblocki said. Asphalt emulsion products are improving but they are more expensive, he said.

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