

What are Coal Tar Sealants?

Coal tar sealants are substances put on driveways, black tops, and parking lots, that are used to extend the life of asphalt. They are also applied because they look very nice. Coal tar sealants contain dangerous chemicals called PAH's.

What are PAHs?

Polycyclic Aromatic Hydrocarbons (PAHs) are the harmful chemicals in coal tar sealants that cause rashes, skin irritations, cancers, mutations, birth defects and even death. They are also toxic to aquatic animals, including fish and aquatic invertebrates. (McIntyre 2017)

This is a benzene compound, a known carcinogen.

PAHs in urban sources

All concentrations in mg/kg (averages of up to 6 studies)

Source	Concentration (mg/kg)
Fresh asphalt	1.5
Weathered asphalt	3
Fresh motor oil	4
Brake particles	16
Road dust	24
Tire particles	86
Diesel engine	102
Gasoline engine	370
Used motor oil	440

Pavement Sealcoat

- Asphalt Based ~ 50
- Coal tar based ~ 70,000

Harmful levels of PAHs in sediment is 22.8 mg/kg!!

USGS

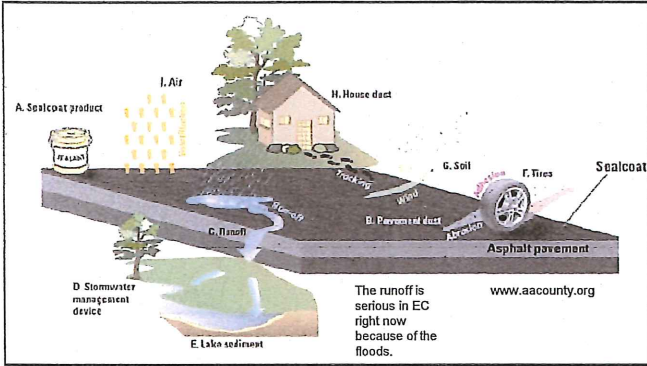
PAHs and the Environment

Coal tar contains 16 PAHs that are classified as U.S. Environmental Protection Agency Priority Pollutants including naphthalene and pyrene (Mahler and VanMetre 2017)

When benthic organisms (bottom-dwellers) are exposed to PAHs they experience problems such as loss of consciousness, inability to reproduce or death, which can disrupt whole food chains. (McIntyre 2017)

Bottom-dwellers

- Freshwater mussels
- Caddisfly larvae
- Mayfly larvae
- Snails
- Stonefly larvae
- Dragonfly larvae



House Dust

House dust adjacent to **coal tar sealed parking lots** contain concentrations of **PAHs 25 times higher** than house dust collected in houses near unsealed or asphalt sealed parking lots. (Williams and Wilbur 2017)

Children crawl and play on floors and put their fingers in their mouths a lot, so they have a higher chance of being affected by PAH's. (Williams and Wilbur 2017)

Household dust with PAHs leads to an elevated cancer risk for children. (Mahler et al 2016)

Runoff into Streams and Lakes

Small streams in Austin, Texas had PAH measurements in the 1000's of mg/kg!!

Coal tar sealants are **10 times more likely to affect fragile species** at the bottom of the food chain than asphalt sealants. (Mahler and VanMetre 2017)

Important Numbers of PAH concentrations

- Coal tar sealants are the largest source of PAHs. (Out of 40 urban lakes tested) (Mahler and VanMetre 2017)
- The Probable Effect Concentration (PEC) for PAHs in sediment is **22.8 mg/kg**. (McDonald et al 2000)

Location	Sealed parking lots (A)	Unsealed parking lots (B)
Top Left	55.2	8.5
Top Middle	<13	<8.6
Top Right	570	24
Middle Left	2.1	0.83
Middle	3,400	21
Middle Right	1,300	47
Bottom Left	3,200	30
Bottom	3,200	2,000

(Mahler and VanMetre 2017)

PAHs and Environmental Health

Varying levels of exposure to PAHs from sealants are toxic to human and aquatic health

"Acutely toxic" to fathead minnows and water fleas (Mahler et al 2016)

May be linked to tumors in brown bullhead catfish in the Anacostia and Potomac Rivers. (Pinkney 2013)

These fish are found throughout Maryland, including the Patuxent and Patapsco Rivers. Also, they're found in other major rivers in the Chesapeake Bay watershed.

Figure 1. Brown bullhead catfish from the Anacostia River, Washington, D.C., are believed to be related to elevated PAHs in the Potomac River water. www.maryland.gov

Effects on Aquatic Life

Fish embryos that are exposed to low amounts of PAHs can develop **eyes with shorter retinas and smaller lenses, misshaped hearts, and abnormal heartbeats.**

The arrows are pointing to the gallbladder. Salmon A (top) was exposed to coal tar, Salmon B (bottom) was not. The gallbladder secretes bile which is supposed to be GREEN, as in Salmon B.

Figure 3. Bile from the liver is excreted into the water for removal from the body. Gallbladder secretion is a yellow-bile or black-green. (a) The bile of salmon receiving exposure to coal tar could not maintain this color. (b) The bile of non-exposed and salmon exposed to runoff from unsealed parking lots is a healthy pale green.

(McIntyre 2017)

Spotted Salamanders



The National Institute of Health (NIH) tested the effects of the toxicity of coal-tar pavement sealants on spotted salamanders. They found that there was a negative effect on swimming. This is concerning because spotted salamanders live here. Also, spotted salamanders' favorite habitats are forests near rivers and streams. Coal tar runoff gets into the rivers and streams and hurt the salamanders.



The National Cancer Institute
The Agency for Toxic Substances and Disease Registry
The US Department of Health and Human Services



These agencies have found out that exposure to PAHs increases risk of cancers in humans and animals, including **skin, lung, kidney, bladder, and stomach cancers.** (Williams and Wilbur *et al*/2017)

Coal tar sealants cancer risks are approximately **one excess cancer per ten thousand exposed individuals.** (Williams and Wilbur 2017) There are about 6 million people in Maryland. That means 600 excess cancers! However, because of bans in 3 Maryland counties, 2.4 million people are protected.

* This is alarming, considering millions of Americans, including minors, live in communities where coal tar sealants are frequently used.



Columbia University Center for Children's Environmental Health

A 2017 study showed that PAH's can cross the placenta and fetal blood-brain barrier triggering inflammation that is toxic to the developing brain.



Alternatives to Using Coal Tar Sealants



Home Depot Latex-ite Sealant Display

Latex-based sealers and asphalt-based sealers are two alternatives easy to get and priced about the same as coal-tar based sealers.

Henry Asphalt Sealants

- [HE532 Driveway Sealer - asphalt based MSDS](#)
- [HE175 Driveway Sealer - asphalt based MSDS](#)
- [HE130 Driveway Sealer - asphalt based MSDS](#)

Gardner Asphalt Sealants

- [Blackjack Ultra - Maxx 1000 - asphalt based SDS](#)
- [Blackjack Drive - Maxx 700 - asphalt based SDS](#)
- [Gardner Max 10 - asphalt based SDS](#)
- [Gardner Pro 7 - asphalt based SDS](#)
- [Blackjack Black Maxx 600 - asphalt based SDS](#)
- [Blackjack Drive-Kote 500 - asphalt based SDS](#)
- [Blackjack New Black 300 - asphalt based SDS](#)
- [Gardner Drive 5 - asphalt based SDS](#)
- [Blackjack Drive-seal 200 - asphalt based SDS](#)
- [Blackjack Commercial - asphalt based SDS](#)




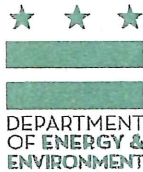

A Comparison of Driveways...



Can you identify the different sealants??

Company	Phone	User	Product do you use?	Comments from the company
RSA Paving	410-730-5177	NO	asphalt-based	
Tesla	301-305-8823	NO	Asphalt-based	
PJ's Driveway	301-605-4288	NO	Nejra Force http://nejra.com/products/sealers/nejra-force	They used to use coal tar but found out that it had carcinogens, so they stopped using it
Aid Paving, LLC	240-442-2404	No	Water-based	
Got paving	410-672-3333	NO	asphalt-based	They don't even try to get it anymore because it's environmentally unfriendly.
EC Home Depot	410-750-2199	NO	Sell Asphalt based sealants	It's an environmental concern, they have a policy not to use it.
EC Lowes	410-869-3140	NO	Latoxite	
AC Paving	410-923-6100	NO	Asphalt-based	

The U.S. Department of Energy and the Environment

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Washington D.C.'s Coal Tar Pavement Sealant Ban

Current legislation, enforcement, and fine structure

- Effective July 1, 2009, it is illegal to sell, use, or permit the use of coal tar pavement products, in the District of Columbia.
- Violators are subject to a daily fine of up to \$2,500 and are required to remediate lots.




Image courtesy of the DOE's coal tar website
@DOEE_DC

Latest Information on the DOE's inspections

DOEE inspects at least 60 properties per year for compliance with the coal tar ban


- FY 2016 - 2017, 66 properties inspected
- No coal tar was found on any of the properties
- 11 of 66 were sealed
- 6 of those 11 had high PAH's (though they did not use coal tar)
- They were all found to be a new sealant called ECR



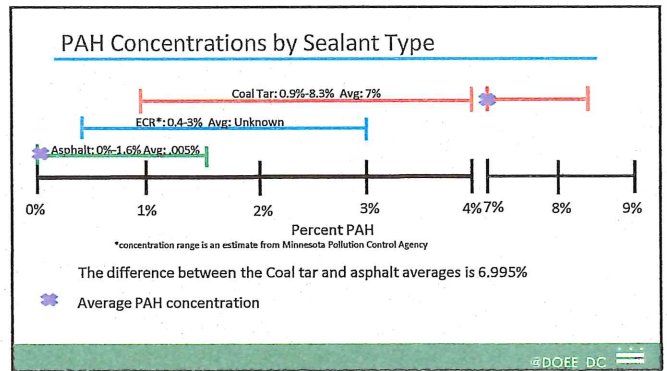
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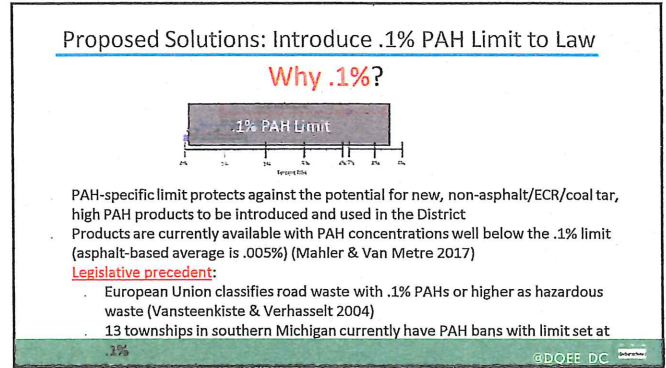
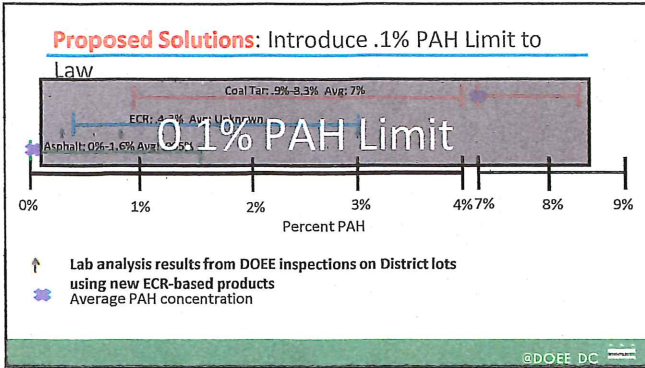
DOEE inspects at least 60 properties per year for compliance with the coal tar ban

- DOE inspectors reported finding zero lots sealed with coal tar products in FY17
- 11 of the 66 lots inspected between October 2015 and December 2017 were sealed
- 6 (55% of sealed lots) indicated high-PAH levels during field inspection test
- All 6 were found to be new, non-coal tar products containing ethylene cracker residue (ECR)



@DOEE_DC





Proposed Legislation in Other Jurisdictions

State	Year Proposed	PAH Threshold
Illinois	2017	0.1%
Michigan	2017	0.1%
Massachusetts	2015	.1%
New York	2017	.1%
Maine	2017	.1%
Indiana	2018	.1%
Virginia (withdrawn)	2018	.1%

@DOEE DC

The E.P.A. and the U.S.G.S

Bans in other local areas were helped with research done by the E.P.A. and the U.S.G.S., including [Washington DC \(2009\)](#), [Montgomery County \(2012\)](#), [Prince George's County \(2015\)](#) and [Anne Arundel County \(2015\)](#). Currently, 40% of all Maryland residents are now under a coal tar ban...why not us???

[22.5 million Americans are currently under a Coal Tar Ban! \(www.coaltarfreeusa.com\)](http://www.coaltarfreeusa.com)

List of U.S. State and County Bans

Albertville, MN
Almont, MI
Annapolis, MD
Ann Arbor, MI
Ann Arbor Township, MI
Anne Arundel County, MD
Austin, TX
Bee Cave, TX
Buffalo, MN
Cannon Falls, MN
Centerville, MN
Circle Pines, MN
Dane County, WI
Dexter, MI
Eden Prairie, MN
Edwards Aquifer Authority, TX
Edina, MN
Elk River, MN
Evanston, IL
coaltarfreeusa.com

Falcon Heights, MN
Glendale, WI
Golden Valley, MN
Greenville, SC
Hamburg Township, MI
Hutchinson, MN
HOWARD COUNTY, MD???
Inver Grove Heights, MN
Home Depot Stores
Throughout US
Little Canada, MN
Loves Stores
Maplewood, MN
Medina, MN
Milwaukee, WI
Minneapolis, MN
State of Minnesota
Montgomery County, MD
New Hope, MN
Newport, MN
North Barrington, IL
Oakdale, MN

Pittsfield Township, MI
Prior Lake, MN
Prince George's County, MD
Rosemount, MN
Roseville, MN
San Antonio, TX
San Marcos, TX
Scio Township, MI
Shoreview, MN
Shorewood, MN
South Barrington, IL
Spring Lake Township, MI

Suffolk County, NY
Vadnais Heights, MN
Van Buren Township, MI
Waconia, MN
Washington, DC
State of Washington
West Bloomfield Township, MI
White Bear Lake, MN
West St. Paul, MN
Westwood, MA
Winnetka, IL
Winnetka, IL
Winfield, KS
Woodland, MN

The U.S.G.S. Experts (United States Geological Survey)

Dr. Barbara Mahler is a Research Hydrologist and Communications Coordinator for the USGS National Water Quality Program

Peter VanMetre is a lead Research Hydrologist for the USGS National Water Quality Program.

Politicians Who are Helping Us!!



United States Congressman from Austin, Texas, Lloyd Doggett, whose proposed bill helped Austin, TX become the **1st city in the US** to ban coal tar sealants.



Washington State Senator David Frockt, whose proposed bill was passed in the House, 64-32, and the Senate, 36-12 making it the **1st state in the nation** to ban the sale and use of coal tar sealants.





Thank you for continuing to keep Howard County a healthy community!

We hope that you will vote in favor of people, not profits.

Sources : Page 1

North American Lake Management Society Lakeline Magazine Spring 2017 USGS Publications

"Toxicity of Coal-Tar Pavement Sealant to Aquatic Animals" Jennifer McIntyre

"Coal-Tar Based Pavement Sealants- A Potent Source of PAH's" Barbara Mahler and Peter Van Metre" USGS

"Trends and Sources of PAH's to Urban Lakes and Streams" Peter Van Metre and Barbara Mahler

"Human Health Concerns Associated with Exposure to PAH's and Coal-Tar Sealed Pavement" Spencer Williams and William Wilbur

5) "Protecting Urban waters and Sediments in Minnesota and the Great Lakes Region" Al Innes

Sources Page 2:

www.mypavementquy.com

<https://www.ncbi.nlm.nih.gov/pubmed/20440554>

<https://www.sciencedirect.com/science/article/pii/S2214750016300051>

<https://www.watershedcouncil.org/coal-tar-sealants-and-pah-contamination.html>

<http://www.coaltarban.com/>

<https://coaltarfreeusa.com/>

<https://www.montgomerycountymd.gov/DEP/contact/coal-tar.html>

<https://www.princegeorgescountymd.gov/678/Coal-Tar-Sealant-Ban>

<https://doee.dc.gov/coaltar>

Sources : Page 3

<http://www.aacounty.org/departments/inspections-and-permits/site-inspections/coal-tar-pavement-ban/>

<https://www.cancer.gov/about-cancer/causes-prevention/risk/substances/coal-tar>

<https://archive.usgs.gov/archive/sites/www.usgs.gov/newsroom/article.asp-ID=3914.html>

<https://ccceh.org/wp-content/uploads/2012/02/perera2006b.pdf>

The bill as written would be detrimental to the businesses (Gem Seal, Sealmaster, Seaboard) represented in Maryland:

- Nearly 70-75% of our volume is shipped out of state. The bill as written, if passed in Baltimore County, would prevent us from selling coal tar sealer to contractors beyond Maryland. Our out of state contractor clients would purchase coal tar sealer products from one of several out of state competitors. We could never survive a drop in volume of that magnitude.
- The bill is modeled after a local municipal ordinance in Michigan where the local governing entity (Lake Huron River Watershed Auth.) consulted with ONE manufacturer who influenced the language to their favor at the expense of their competitors.
- Sales of pavement sealer of any type have declined over 40% in the Austin TX area, the first municipality to pass a ban in 2007.
- The bill specifically eliminates alternative sealers that have low PAH content and have been approved for use in Austin TX.
- This bill potentially eliminates certain brands of asphalt based sealers at .1% PAH level.

The bill claims that exposure to coal tar sealer increases cancer risk 38 times is a completely false claim:

- Coal tar sealer is not listed as a carcinogen by IARC or any other organization.
- The mission of the USGS does not include determining the carcinogenicity of any product or substance. The USGS (Mahler and Van Metre) never conducted any study to determine the carcinogenicity of coal tar sealer.
- In the nearly 15 years that USGS has been targeting coal tar sealers, they have never established a link to human cancer or adverse health effects from to coal tar sealer, likely because.....
- In the 60+ years that coal tar sealers have been commercially available, there is absolutely no history of human cancer or adverse health effects from this product to the general public, or by those who manufacture sealer, manufacture the raw material, or apply coal tar sealers. The statement is based on a model that makes numerous assumptions. Historical human health records both medical and OSHA related do support this claim.

What was missed in the student's research report:

- There was no effort to interview at least one of 3 of the local sealer manufacturers, a contractor, or a producer of RT-12 about coal tar sealers and PAHs.
- There was no effort to interview any of the scientists that peer reviewed the USGS research and found it to be deeply flawed.
- There was no effort to consult one of many independent researchers who have done multiple studies (all peer reviewed) on coal tar sealers and PAHs like Dr. Kirk O'Reilly (geochemist), Dr. Robert DeMott (toxicologist), Dr. Tom Gauthier (environmental geologist), Dr. Brian Magee (toxicologist specializing in PAH toxicology and risk assessment), or Dr. Sung Woo Ahn (environmental scientist)
- **There was no balanced or objective approach.**