

Challenges and Proposed Solutions to the District's Coal Tar Pavement Sealant Ban

Lillian Power and Zachary Rybarczyk
Environmental Protection Specialists



@DOEE_DC

The District's Coal Tar Pavement Sealant Ban

Current legislation, enforcement, and fine structure

- *Comprehensive Stormwater Management Enhancement Amendment Act of 2008*
- 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 DOEE coal tar website

Refresher on PAHs—What are they?

Polycyclic Aromatic Hydrocarbons (PAHs) are ever-present in the urban environment

- Form from the heating or burning of carbon (organic) materials
- U.S. EPA designated 16 PAHs as “priority pollutants”:
 - 6 are “probable carcinogens”
 - 1 is a “known carcinogen”
 - benzo[a]pyrene
- Common sources of PAHs:
 - Tire and brake dust
 - Engine exhaust
 - Used motor oil
- Sealant PAHs in the environment:
 - Sealcoat erosion
 - Stormwater runoff
 - Volatilization in the air

(Mahler & Van Metre 2017)



PAHs and Environmental Health

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

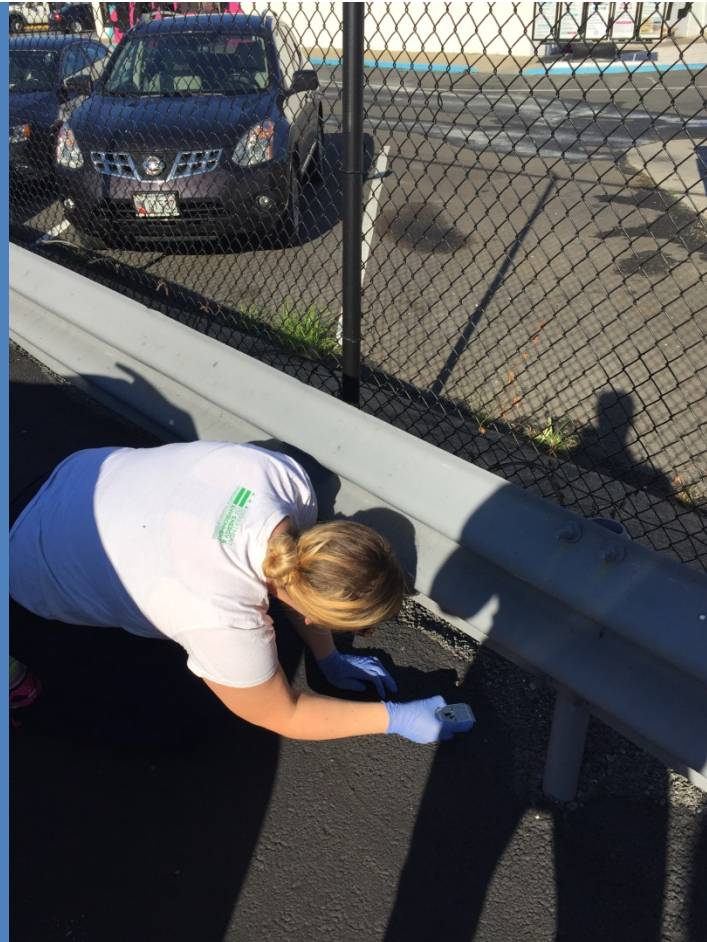
- **Aquatic life**
 - “Acutely toxic” to fathead minnows and water fleas
 - (Mahler *et al* 2016)
 - May be linked to tumors in brown bullhead catfish in the Anacostia and Potomac
 - (Pinkney 2013)
 - Probable Effect Concentration (PEC) for PAHs in sediment is 22.8 mg/kg (.00228%)
 - (MacDonald *et al* 2000)
- **Human life**
 - Household dust and elevated cancer risk for children
 - (Mahler *et al* 2016)



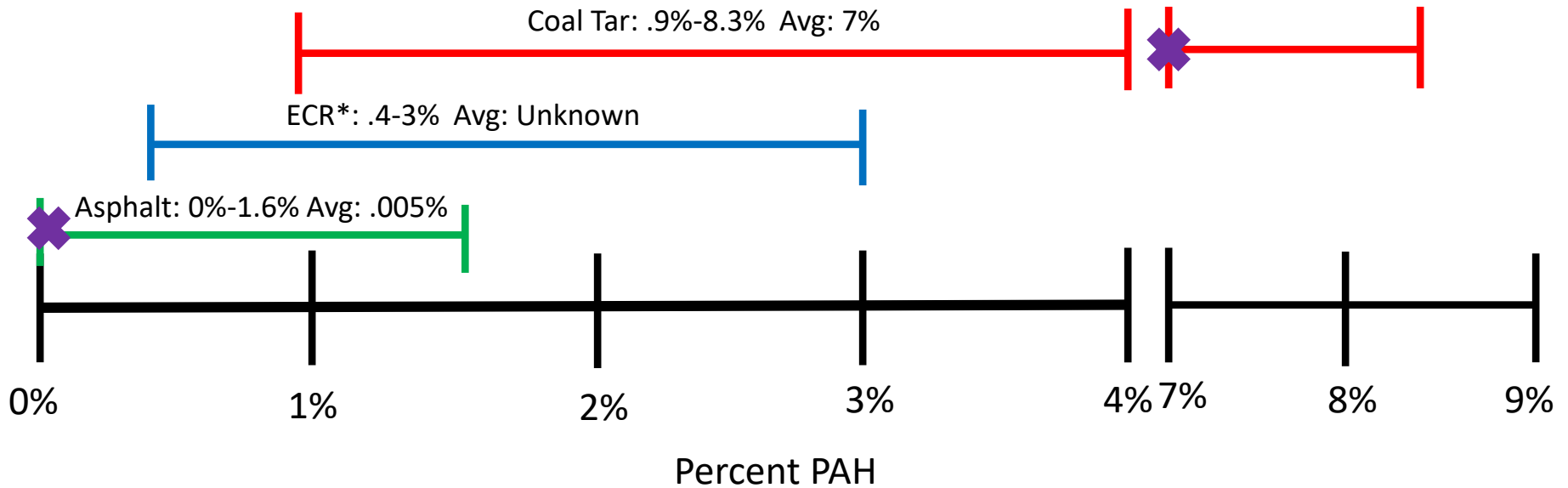
Background on DOEE Enforcement

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

- DOEE inspectors reported finding **zero** lots sealed with coal tar products in FY17
- 11 of the 66 lots inspected between October 2016 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)



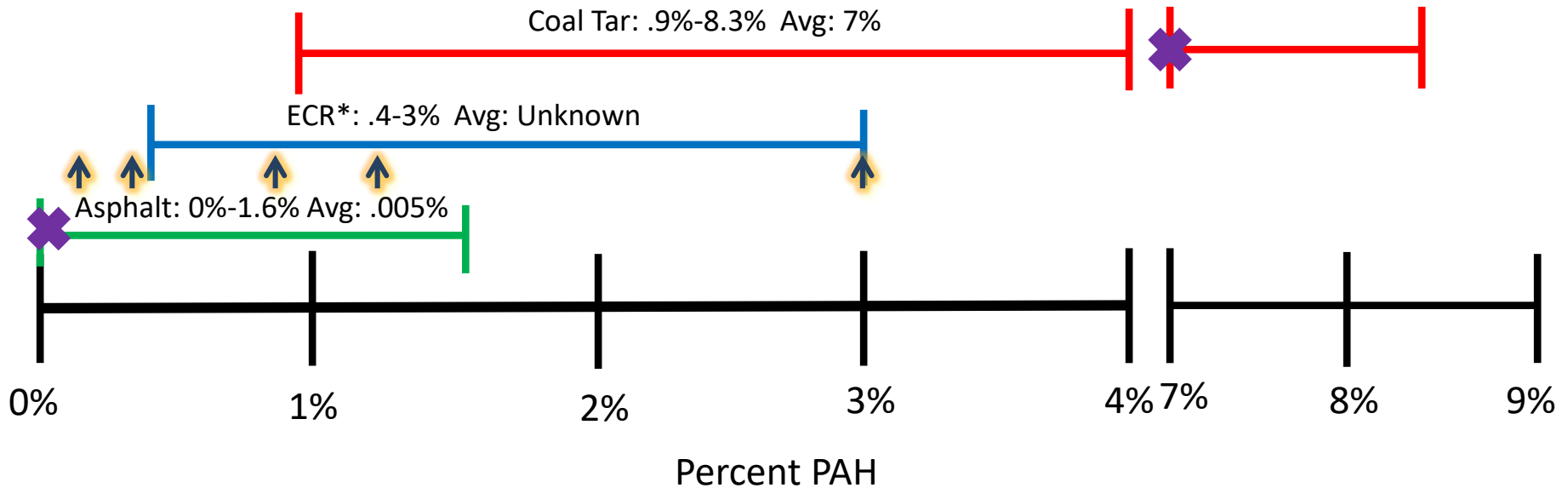
PAH Concentrations by Sealant Type



*concentration range is an estimate from Minnesota Pollution Control Agency

✖ Average PAH concentration

PAH Concentrations by Sealant Type

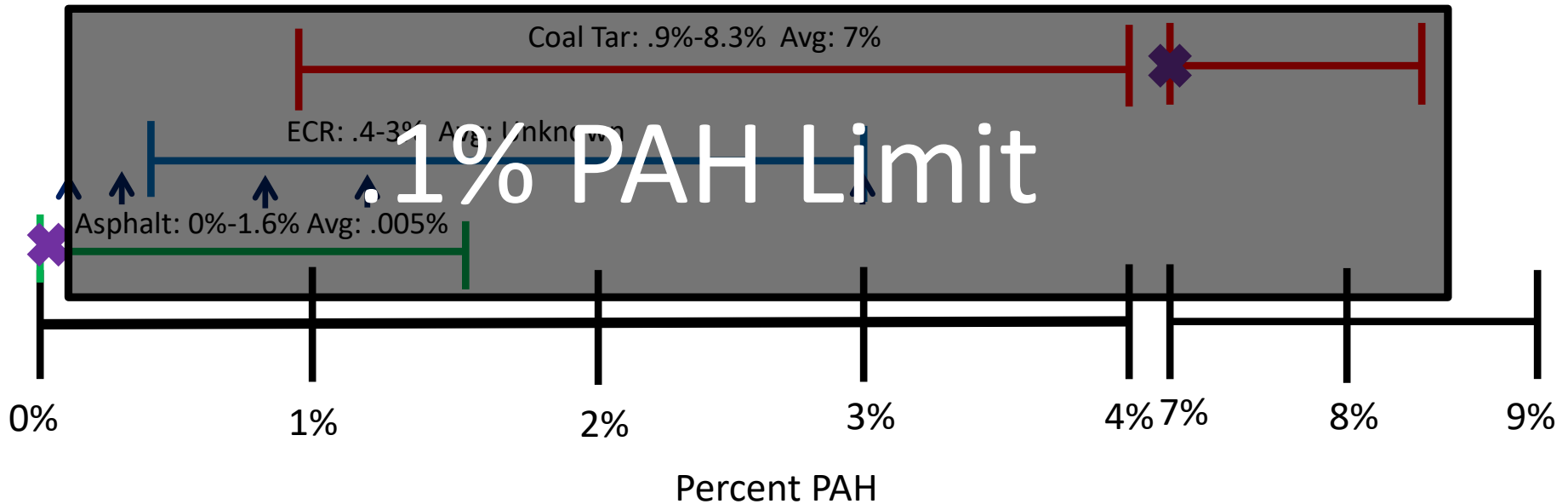


*concentration range is an estimate from Minnesota Pollution Control Agency

↑ Lab analysis results from DOEE inspections on District lots using new ECR-based products

✖ Average PAH concentration

Proposed Solutions: Introduce .1% PAH Limit to Law

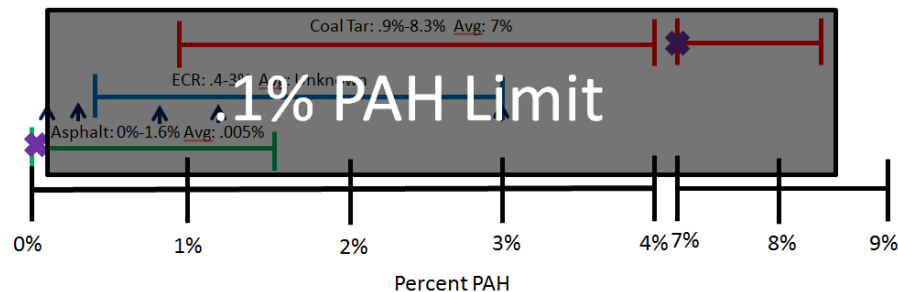


↑ Lab analysis results from DOEE inspections on District lots using new ECR-based products

✕ Average PAH concentration

Proposed Solutions: Introduce .1% PAH Limit to Law

Why .1%?



- PAH-specific limit protects against the potential for new, non-asphalt/ECR/coal tar, high PAH products to be introduced and used in the District
- Products are currently available with PAH concentrations well below the .1% limit (asphalt-based average is .005%) (Mahler & Van Metre 2017)
- Legislative precedent:
 - European Union classifies road waste with .1% PAHs or higher as hazardous waste (Vansteenkiste & Verhasselt 2004)
 - 13 townships in southern Michigan currently have PAH bans with limit set at .1%

Proposed Legislation in Other Jurisdictions

State	Year	PAH Threshold
	Proposed	
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%

Proposed Legislative Language

DOEE proposes amending the District's legislation from 2008 with the following:

- **Adds “high PAH sealant products” to the ban, which would include:**
 - Coal tar products
 - Coal tar-related products
 - Ethylene cracker residue (ECR) products and their offshoots; and
 - All sealant products over .1% PAH by weight
- **Establishes the authority to create a list of compliant products in the District**
- **Reasserts authority for DOEE to inspect potentially sealed properties**

Proposed Solutions: .1% Product Certification



- DOEE working with Huron River Watershed Council and the National Sanitary Foundation
- Products—not applicators or contractors—would require certification to be used in the District
- Manufacturers would submit products for testing and get a “seal of approval” if PAH threshold is met

Sealant Product PAH Certification Design Process

Protocol and Certification Path

- 6-9 month-long process
- Develop methodology and testing protocol for sealant products
- Involve 4-5 external bodies during review
 - Regulators, industry, applicators and other users
- Testing is proprietary to NSF
- Requires limited up-front capital for testing equipment purchase

ANSI National Standard Path

- 1-2 year-long process
- Develop standard using protocol as basis for research
- Involve 30-40 stakeholders for diverse input
- Subject to public review and comment period
- Standard becomes a public method; testing can be completed at any lab

For Discussion:

- **Feedback on proposed solutions**
 - .1% PAH threshold amendment
 - 3rd party product certification for manufacturers
 - Feasibility and interest from jurisdictions to join in developing protocol and/or certification
 - Feasibility and interest from jurisdictions to amend legislation to include a .1% PAH threshold
- **Action Items**
 - Letter to NSF on behalf of the CBPC
 - Supporting the certification process (development of either protocol or standard)

Bibliography

MacDonald, D.D., Ingersoll, C.G. and Berger, T.A., 2000. Development and evaluation of consensus-based sediment quality guidelines for freshwater ecosystems. *Archives of environmental contamination and toxicology*, 39(1), pp.20-31.

Mahler, Woodside, & Van Metre. 2016. Coal-Tar-Based Pavement Sealcoat—Potential Concerns for Human Health and Aquatic Life. USGS Fact Sheet.

Mahler & Van Metre. 2017. Coal-tar-based Pavement Sealants- A Potent Source of PAHs. NALMS Lakeline Magazine.

Pinkney. 2013. Tumors in Brown Bullhead Catfish in the Anacostia and Potomac Rivers, Survey Results 2009-2011. U.S. Fish & Wildlife Service.

Vansteenkiste, Stefan O., and André FP Verhasselt. 2004. "Comparative study of rapid and sensitive screening methods for tar in recycled asphalt pavement." *Road Materials and Pavement Design* 5 (sup1): 89-106.