

BEST PRACTICES

What's Really Running Off Your Roof?

An Emerging Problem

In 2011, the Washington State Department of Ecology (Ecology) worked to investigate sources of toxic pollution entering Puget Sound waters. They found that roofing materials may be sources of arsenic, cadmium and phthalates but wanted to know more about how our regional weather patterns might affect the release of contaminants from roofing materials. The Environmental Protection Agency (EPA) funded Ecology to conduct a pilot project from 2012 to 2014 to look closely at roofing material types in the Puget Sound region. In 2016, the Washington Stormwater Center continued and expanded upon the previous study.

Residential and commercial roofs leach a significant amount of zinc, arsenic, and copper, some of which eventually finds its way into Puget Sound.



Conducting Roof Study

The Study

- 18 4'x8' pilot scale roof panels were constructed
- Samples of runoff were collected from 26 rain events (both studies)
- Samples were analyzed for pollution sources including 5 different metals, polycyclic aromatic hydrocarbons (PAHS) and phthalates

The Findings

The original 2011 study found that the following roofing materials released the highest levels of target pollutants:

- Treated wood shakes
- Copper
- Polyvinyl Chloride (PVC)
- Zincolume (aluminum zinc alloy sheet metal roofing)
- Ethylene propylene diene monomer EPDM (rubberized single ply)

Just after one year of aging, the study found a significant reduction in the metal concentrations in the roof runoff.

What We Know

Residential roofs leach a significant amount of arsenic and copper and commercial roofs leach a significant amount of zinc. Treated wood shakes are the primary source of arsenic. Further long-termed studies are needed to

understand how age affects what a roof leaches. As roofing materials continue to age, concentrations of pollutants released may change over a 10 to 20 year life of a roof. The entire system of a roof should be assessed including gutters, downspouts, flashing, ventilation and HVAC, which could also contribute to leaching.

So What's The Problem?

Pollutants such as arsenic, copper, and zinc can be lethal to aquatic life including our local salmon and shellfish populations. These pollutants are picked up by rain and precipitation as it flows across yards, roads, and hard surfaces before finding its way to a storm drain or directly into the nearest body of water. If the roofs of every building leaches pollutants like this and contaminants are not all captured and treated, then we can deduce where the large sources of arsenic, copper and zinc in Puget Sound might be coming from.

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