

**Testimony to OMB – Impacts of Coal Combustion Wastes, 11 November 2009  
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*Besides Selenium, many other contaminants are substantially elevated in coal ash relative to non-impacted systems.*

– Contaminants typically elevated in sediment, water, and organisms include, but are not limited to: **As, Cd, Cr, Cu, Ni, Pb, V, Zn**

– Perhaps most concerning is the accumulation of these elements in animal tissues, which in many cases has been shown to have biological impacts.

For example, tadpoles collected from ash retention ponds and a downstream swamp contained **20 x more As, 11 x more Cd, and 4 x more Cr** than those from nearby uncontaminated areas.

> **98 %** of these animals (of nearly 1000 collected), displayed **developmental malformations** of the mouth which **restricted feeding and growth**, as well as spinal **malformations** similar to the fish in Dr. Lemly's studies.

Accumulation in tissues, developmental, metabolic, and/or reproductive toxicity have also been linked to these compounds in **shrimp, crayfish, fish, other amphibians, snakes, turtles, alligators, and birds.**

*An issue that cannot go unnoticed is that these systems can act as  
“**Population Sinks.**”*

Annual use of the systems for breeding which, as we have shown with one species (toads), results in **mortality of all the offspring.**

This continual loss of offspring leads to **reduced populations**, which can only be sustained by **migration from other populations.** In other words, the **ash sites “steal” healthy animals from other, uncontaminated areas** where they themselves suffer the same fate. = a **“reproductive black hole”.**