**Selenium Toxicity to Aquatic Organisms**

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Since selenium was identified at concentrations above the currently applicable chronic water quality criteria of 5 ug/l in the Draft Programmatic Environmental Impact Statement (June 2003), several studies have been undertaken to assess the potential for toxicity to aquatic organisms in West Virginia streams. Publically available data will be discussed, along with ongoing research into the potential effects of selenium on invertebrates and vertebrates in West Virginia streams. Selenium accumulates into aquatic systems via uptake from the water column into the base of the food chain. This step, termed the enrichment factor, is the single largest step in the accumulation of selenium and is measured in algae, periphyton, sediment, and biofilm. Aquatic macroinvertebrates consuming the organic material further accumulate the selenium with the rate of increase in macroinvertebrates and vertebrates described as trophic transfer factors. Current discussions on the toxicity of selenium focus on effects on larval fish. Female fish exposed to dietary selenium pass the selenium into yolk sac material of developing eggs. Upon hatching, the larval fish absorb the yolk sac and the selenium which may lead to the development of teratogenic deformities and other abnormalities. An increase in the rate of deformities in a fish population could lead to community level effects in aquatic systems. Evaluations of larval fish for selenium related deformities have been carried out in several West Virginia watersheds. Findings of these studies will be discussed. Additionally, the likelihood of toxicity to aquatic benthic macroinvertebrates will be evaluated. It has been widely accepted that larval fish deformity rates are the most sensitive endpoint in the evaluation of selenium impacts in aquatic systems. However, recent speculation as to the potential effects on sensitive mayfly taxa has raised a concern that the macroinvertebrates impacts have been overlooked. Available data from West Virginia streams will be compared with literature thresholds and the potential effects on macroinvertebrates will be discussed.