

Mechanisms of Arsenic Accumulation and Biogeochemistry in Evaporation Ponds

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Executive Summary:

The hazards of selenium ecotoxicity to waterbirds in evaporation basins are minimized by several sink mechanisms reducing selenium (Se) concentration in the evapoconcentrating waters and by installation of compensation and alternative habitats when risk is high. In contrast, our preliminary data indicate that behavior and fate of arsenic (As) in impounded drainage water are not fully understood. In a previously studied evaporation basin, arsenic and selenium did not accumulate in direct proportion to increase in salinity while in another basin, preliminary data show that arsenic appears to increase in direct proportion to salinity but not selenium. Currently, there is no evidence of arsenic toxicity to waterbirds but as evaporation basins mature arsenic may continue to accumulate. Thus, there is a need to investigate the mechanisms or processes governing arsenic accumulation and biogeochemistry in evaporation ponds. Such basic knowledge would be essential to help establish whether or not arsenic is likely to be a constituent of concern in evaporation basins.