

Arsenic and other Heavy Metals in Surface Water in Swaziland, Southern Africa

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Abstract. Swaziland, a kingdom in southern Africa, suffers from the highest per capita rates of both HIV (26-31% of adult population) and tuberculosis (1.3% of adult population) infection in the world. There is considerable overlap among the infected populations as 80% of tuberculosis patients are also HIV positive. Recent studies have shown that elevated levels of As and other heavy metals (especially Cd and Pb) in blood, hair, and nails are good predictors of development of secondary infections such as tuberculosis in individuals who are HIV positive. Swaziland is an area that would be expected to have elevated environmental As due to the abundance of Au, Fe and Sn mines, and the continued use of arsenical pesticides and herbicides in sugarcane farming and pulp forestry. The objective of this study is to carry out the first As survey in Swaziland by focusing on surface water, which can provide a rapid assessment of As in the regional hydrologic system. A total of 94 water samples have been collected throughout Swaziland from the major rivers (Komati, Umbuluzi, Usutu, Ngwempsi, and Lusushwana) and their tributaries. Water temperature and pH were measured on-site with the Hach EC-10 pH Meter. Concentrations of nitrate, phosphate and sulfate have been measured with the Hach DR-2700 Spectrophotometer. The Optima 8000 ICP-OES (Inductively Coupled Plasma - Optical Emission Spectrometer) is being used to measure concentrations of As and associated elements Ag, Cd, Co, Cr, Cu, Fe, Mn, Ni, Pb, Sn, Ti and Zn. Results will be reported at the meeting.