

**ACID MINE DRAINAGE AND HEAVY METALS CONTAMINATION OF SURFACE WATER AND SOIL IN SOUTHWEST BURKINA FASO–WEST AFRICA**

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**ABSTRACT**

In Southwest Burkina Faso, a decade of gold mining at Poura left large stockpiles of mine wastes. Once exposed to the atmosphere and water, these wastes may be oxidized leading to generation of a highly acidic effluent known as Acid Mine Drainage containing a series of potentially toxic dissolved metals. In the present study, surface water, groundwater, soil and mine waste samples were collected around the Poura Gold mine, to assess a possible release of heavy metals in the surrounding environment. The low pH values (~2.23) and high heavy metal contents measured in some surface water originating from oxidized zones of the waste stockpiles attested that the site has been subject to the acid mine drainage. Furthermore, geo-accumulation index of soil and mine waste samples indicated that the surrounding soils are contaminated by heavy metals. That is, it has been established that the soils were moderately contaminated by arsenic, cobalt, chromium, copper, lead and nickel, whereas they are moderately to strongly contaminated by arsenic. Likewise, mine wastes samples were moderately contaminated by arsenic, cobalt, chromium, copper, lead, zinc and nickel in one hand and moderately to strongly contaminated by arsenic, copper and lead in the other hand. Arsenic is the most polluting element and induces high contamination of the mine wastes (strongly contaminated: Igeo class 4 with Igeo value ranging from 3 to 4). The source of these heavy metals is sulfides e.g. arsenopyrite: FeAsS, chalcopyrite: CuFeS, galena: PbS encountered in the mineralized host rocks at Poura which was operated and has produced several tons of mine wastes and waste rocks stored since many years.

**Keywords:** Mine wastes, Heavy metals, Contamination, Environment, Burkina Faso.