

Water Technology Research Group

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INFLUENCE OF POSSIBLE SECONDARY SULPHATE MINERAL FORMATION ON THE IMPACT OF ACID MINE DRAINAGE TO SURFACE WATERS

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EXECUTIVE SUMMARY

Acid mine drainage (AMD) is a major environmental pollutant of both surface and ground waters (Kelly, 1988; Parsons, 1977). Intensive sampling of drainage from mine adits has revealed a seasonal variation in the Zn:Cu ratio. This is linked to secondary sulphate mineral formation due to wetting and drying cycles within the mine workings and surface spoil heaps, leading to an annual cycle of formation and dissolution causing a predictable fluctuation in the Cu concentration only. The variation in the Zn:Cu ratio leads to extreme variations in the toxicity of drainage, and linked with increased adit flows during wetter months, results in higher river toxicity, even at high river discharge rates. This seasonal variation in toxicity of AMD from underground workings, or from mines with extensive surface spoil, has important ramifications for its control to surface waters.

