

Characterization of potential sources of acid rock drainage (ARD) in Masbate Gold Project, Aroroy, Masbate, Philippines

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Mining companies spend funds yearly to prevent acid drainage formation and/or for treatment of these wastes. This form of pollution have been reported to originate from mine wastes, known as acid mine drainage (AMD) or from sulfide-containing natural rocks, known as acid rock drainage (ARD) (Vaughan and Corkhill, 2017). Acid rock drainage caused by weathering oxidation of sulfide minerals is a major environmental concern during and even cessation of the mining operations. The first step in treating or preventing the acid drainage formation is to identify the potential sources. This study aims to give a detailed characterization of waste rocks from the Masbate Gold Project (MGP) in Aroroy, Masbate, Philippines. The mine segregates waste rocks into Potential Acid Forming (PAF) and Non-Acid Forming (NAF) as part of ARD management. Seven (7) ore and seven (7) waste rocks from the Colorado and Main Vein open pits were subjected to transmitted and reflected light microscopy. Results show that two (2) high grade samples and two (2) waste rocks contain moderate to intense sulfides which may classify them as PAF rocks. Pyrites from the PAF samples are typically idiomorphic and exhibit variable crystal shapes, while chalcopyrite forms individual grains, interlocking with pyrite. These were correlated with the geochemical data of the 4 samples and were found to contain a significant amount of sulfur compared to the other 10 NAF. A more detailed geochemical study of waste rocks is suggested such as X-ray Diffraction (XRD) analysis or Electron Probe Microanalysis (EPMA), to know the amount of the heavy metals contained in the sulfides such as arsenic, cobalt, lead, nickel, and zinc that may be released in the environment during decomposition.