
Geochemical and fluid inclusion study of a suite of samples from Busang, Kalimantan, Indonesia

EVAN SLATER¹, MARCOS ZENTILLI¹, AND JACOB HANLEY²*1. Department of Earth Sciences, Dalhousie University, Halifax, Nova Scotia B3H 4R2, Canada <evan.slater@dal.ca> ¶**2. Department of Geology, Saint Mary's University, Halifax, Nova Scotia, B3H 3C3, Canada*

From 1992 to 1997 Bre-X Minerals Ltd. alleged to have found one of the richest gold deposits on earth in central Kalimantan, Indonesia. In 1996 Dalhousie Professor G.C. Milligan was invited to visit Busang and collect samples from the highest grade zones. Initial study of these samples in Halifax failed to detect any gold. In 1997 independent evaluations determined that Busang samples had been systematically salted, unearthing one of the worst mining hoaxes in history.

The suite collected by Dr. Milligan includes 12 samples of drill core from the Busang Southeast Zone. Here they have been re-studied petrographically and analyzed for major and trace elements, and microthermometry of quartz-hosted fluid inclusions has been carried out on mineralized veinlets. Samples are volcanic and subvolcanic andesite-dacite and their geochemistry suggests calc-alkaline magmas generated in continental arcs typical of the host rocks in the Kalimantan Gold Belt. Alteration consists of silicification, calcitization, sericitization, and chloritization. Quartz-calcite (\pm gypsum/anhydrite) veinlets contain pyrite, sphalerite, galena, tetrahedrite-tennantite, and lesser chalcopyrite, but no discrete Au or Ag minerals are noted. Pyrite is ubiquitous throughout the altered rocks as dendritic veinlets and clots. Rare fluid inclusions in veinlet-hosted quartz are small ($< 20 \mu\text{m}$) and prismatic to irregular and dominantly two-phase (L-V) aqueous with anticipated high temperatures of homogenization based on their L:V ratios. They are unclassified, as they do not occur along temporally constrained features such as growth zones or healed fractures.

In conclusion, the suite represents a moderately mineralized system hosting base metal likely generated by

hydrothermal fluids of probable magmatic origin. As such, it is compatible with location at the fringe of an epithermal precious metal system. However the absence of a significant gold anomaly (8–139 ppb Au) and the lack of textures typical of low-sulfidation epithermal deposits are incompatible with the suite representing a rich ore deposit.