

# SOIL AND BIOGEOCHEMICAL SIGNATURES OF THE ARIPUANÃ BASE METAL DEPOSIT – MATO GROSSO, BRAZIL

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## SITE CHARACTERISTICS

The Aripuanã Zn-Pb-(Cu-Au-Ag) prospect is about 15 km NW of Aripuanã Mato Grosso State, Brazil (Fig 1). It has a humid tropical climate and a rainfall of about 2000 mm pa. Secondary tropical rainforest now covers most of the prospect area (Fig 2); primary rainforest is preserved in valleys.



Figure 2



Figure 4



Figure 5



Figure 6

The landforms are dominantly erosional (Traverse 1, Fig 3A) with saprolite, saprock and gossan subcrop and outcrop on the ridge and along either flank. The soil is thin and residual (Fig 4). Further down slope, colluvium (100-500 mm) (Fig 5) covers saprolite, increasing to tens of metres thickness along the flanks of small valleys (Traverse 2, Fig 3B).

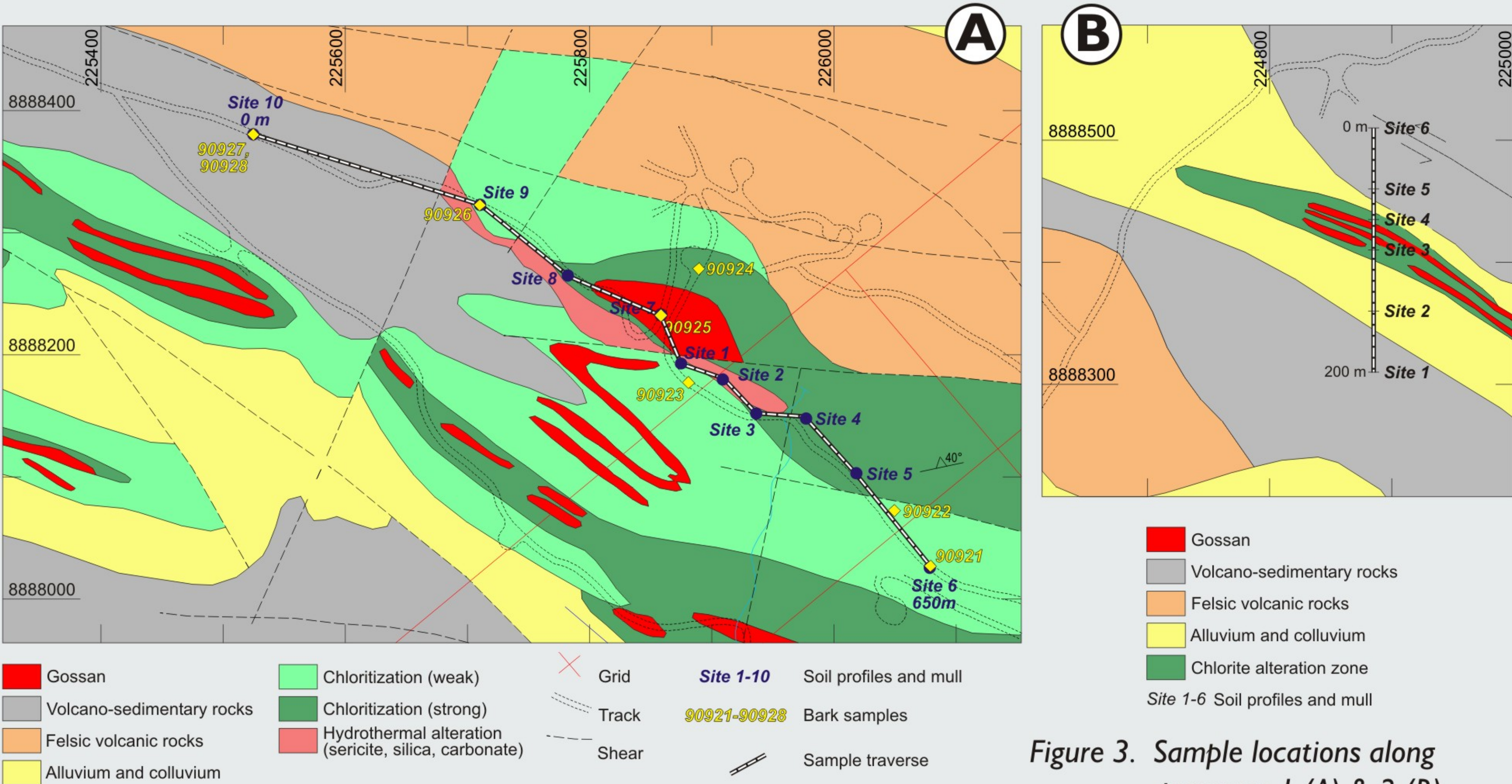


Figure 3. Sample locations along traverses 1 (A) & 2 (B)

## METHODS

Saprolite and <75 µm and <250 µm fractions of A and B horizon soil samples were analysed for 68 elements following multi acid, aqua regia and fusion digests. Mull and bark of imbauba trees (*Moraceae* family, genus *Cecropia*) (Fig 6) were prepared by two different methods. One portion of each sample was dried, ground and digested in aqua regia. A second portion was ashed (controlled ignition) and digested in aqua regia. All solutions were analysed by ICP-MS.

Inorganic material inadvertently included with the mull (ash yields 3.3% - 33.4%) appears to have only a minor effect on anomaly shapes and contrasts.

## RESULTS

In erosional areas with subcropping mineralization, anomaly contrasts are strongest in the <250 µm soil fraction (Traverse 1, Fig 7). In depositional areas (Traverse 2, Fig 7), the contrast is best in the fine (<75 µm) fraction. The strongest contrast in Ag, As, Au, Cd, Co, Cu, Fe, In, Mn, Mo, Pb, Sb, Se, Tl and Zn is in the A-horizon humic soil; ashed mull samples show similar contrasts to those in the B-horizon. Bark samples show a strong response in Mo and a weak response in Pb and W (not shown) over the gossanous zones.

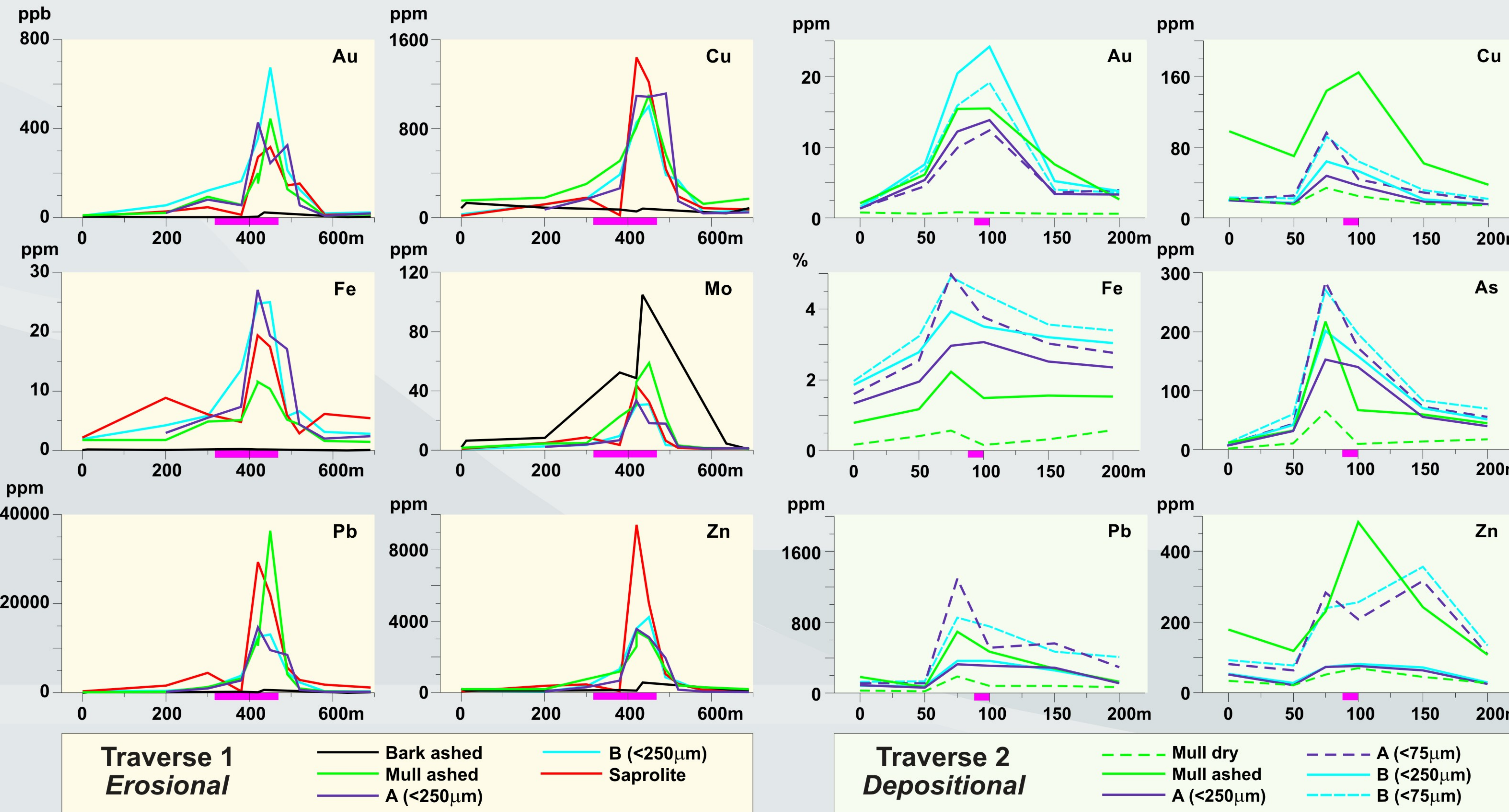


Figure 7. Element concentrations in different sample media along traverses 1 and 2. The magenta bar marks the gossan.

## CONCLUSIONS

A-horizon soil and mull samples both clearly define the surface expression of the base metal mineralization in erosional and depositional areas at Aripuanã and are low environmental impact/low cost alternatives to costeaning and drilling. However, mull samples are easier to collect and are a cost-effective alternative to soil. Bark has a well-defined Mo-(Pb-W) signature over gossan and may be a useful sample medium in areas of thicker cover.

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