

## Multi-elemental anomalies of anthropogenic sources in the Rio das Velhas Basin, Minas Gerais State, Brazil

<sup>a</sup>Viglio E.P., <sup>b</sup>Cunha F.G.

The Rio das Velhas' basin has an approximate area of 29,13 thousand km<sup>2</sup> and is located in the central part of Minas Gerais State, draining important metropolitan regions and Limestone, Fe, Mn and Au mining areas. The vegetable cover is formed by re-forest regions, pastures and native vegetation. The resident population is estimated in 4,5 million inhabitants and are distributed in 51 cities with 70% in the Metropolitan Region of Belo Horizonte (RMBH), state capital. Archean and paleoproterozoic rocks from the Quadrilátero Ferrífero (the iron quadrangle) and granite-gneiss complexes to south of the basin, quartzites and conglomerates from Espinhaço Supergroup to the east, limestones and metapelitic rocks from Bambuí Group and lateritic covers in the central-north region compose the geology of the basin. In a low density survey carried out by Geological Survey of Brazil 204 superficial water samples, 218 stream sediments samples and 72 soil samples were collected. The superficial water samples and the stream sediments samples were collected in basins with area between 100 to 200 km<sup>2</sup>. The soil samples were collected in a approximately 25 x 25 km grid. The stream sediments samples and soil samples were analyzed by ICP-MS for 53 elements. The superficial

water was analyzed by ICP-MS and OES for 26 cations and by Ionic Chromatography for 7 anions. The survey was realized from 2008 September to December. The physico-chemical parameters pH, Dissolved Oxygen, Conductivity and Temperature were obtained in loco. The distribution curves of superficial water anions Br, Cl, F, NO<sub>3</sub> and PO<sub>4</sub> and cations Ba, K, Li, Mn and Na shows clearly the Metropolitan Region of Belo Horizonte (RMBH), although only K, Br and Na have currently values (9.290, 0.070 and 5.600 mg/L, respectively) above the legal permitted values in Brazil (0.037, 0.025 and 0.100 mg/L, respectively). The obtained results in stream sediments for the elements Ag, Ca, Cd, Cu, Fe, Hf, Hg, Ni, P, Pb, S, Sb, Sn, Sr, W, Zn and Zr and in soil for the elements Ag, La and Sb also delineate the RMBH, strongly suggesting a anthropogenic source for these anomalies.

### References

Viglio, E.P. & Cunha, F.G. 2010 - O Atlas Geoquímico da Bacia do Rio das Velhas. Papel e CD. 196p. 51 Mapas de solo, 53 Mapas de sedimento, 32 Mapas de água de superfície e 27 Mapas de água de abastecimento público. CPRM

<sup>a</sup> MSc Geochemistry from Geological Survey of Brazil ([eduardo.viglio@cprm.gov.br](mailto:eduardo.viglio@cprm.gov.br))

<sup>b</sup> PhD Geochemistry from Geological Survey of Brazil ([fernanda.cunha@cprm.gov.br](mailto:fernanda.cunha@cprm.gov.br))