

Mercury pollution caused by small-scale gold mining (“garimpos”) in Mariana, Minas Gerais State, Brazil

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This research aims at appraising the consequences of the centenary “garimpo” activities in the alluvial deposits of the Carmo River (Doce River basin), in Monsenhor Horta district, in Mariana municipality, at Minas Gerais State.

To conduct a preliminary diagnosis, stream sediments, suspended particule matter (SPM) and tailing samples were collected. Concentration of total Hg in stream sediments (fraction $< 74\mu\text{m}$) were above the maximum permissible limit ($0,1\mu\text{gHg/g}$), varying from 194 to 280ppb (average: 237ppb). These values are not too high if one considers the local gneissic bedrocks (of igneous origin and Archaean age), where the backgrounds are higher. The *Geoaccumulation index (Igeo)* of Müller indicates a lower grade of contamination (class 1, for a range from 0 to 6). As expected, in the SPM total Hg concentration are higher, varying from 82 to 562ppb. In the tailing samples, Hg concentration average was 253ppb, very near the sediments average, showing that the miners did not use Hg in the gravitational concentration stage.

In conclusion, there are two sources of mercury pollution:

- Solid tailings from the concentration with pan, using mercury.
- Atmospheric emissions when burning the amalgam.

Financial support: *Foundation for Research Support of Minas Gerais State & Mineral Technology Center (CETEM/CNPq)*