

H AND O ISOTOPES AS TRACERS OF BARIUM ANOMALIES IN BAURU AQUIFER SYSTEM, SÃO PAULO STATE, BARZIL

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Barium anomalous concentrations have been frequently detected in public supply wells monitored by the Company of Environmental Sanitation Technology (CETESB) in São Paulo State. These anomalies are mainly related to Bauru Aquifer System (Marília and Adamantina Aquifers), that supplies 32.5% of the municipalities of São Paulo State.

For this study twelve groundwater and two surface water samples were collected for isotopic analysis of O and D, in order to evaluate the origin of Barium. Groundwater samples were collected in the Galia city, at a SABESP public supply well (P41), that achieves waters from boths Marília and Adamantina aquifers, and at three monitoring wells installed at the study area. These wells are multilevel monitors, each one screened at a different depth interval (24-25, 58-59 and 89-90 meters below surface), monitoring only the Marília Aquifer groundwater. The surface water correspond to a pond and a stream located near the P41 well.

The stable isotopes data clearly reveal the presence of two water groups. The first group presented $\delta^{18}\text{O}$ values from -7.11 to -7.43 and δD values from -49.61 to -43.57. The second group presented $\delta^{18}\text{O}$ values from -8.55 to -8.74 and δD values from -60.26 to -50.68. The first group are related to the samples with higher Ba concentrations Ba (1.20 to 1.60 ppm), to the shallowers waters and to calcic bicarbonate water types. The second group of samples is related to samples of lower concentrations of barium (0.69 to 0, 86 ppm) and deeper waters, classified as sodium bicarbonate, which correspond to Adamantina Aquifer type, with incipient carbonatic cement.

The distinction of two groups by H and O isotopes supported by the geological and chemical data, indicate that barium anomalies are linked to the Marília aquifer and its carbonatic cement and that stables isotopes were good tracers for this case.





