

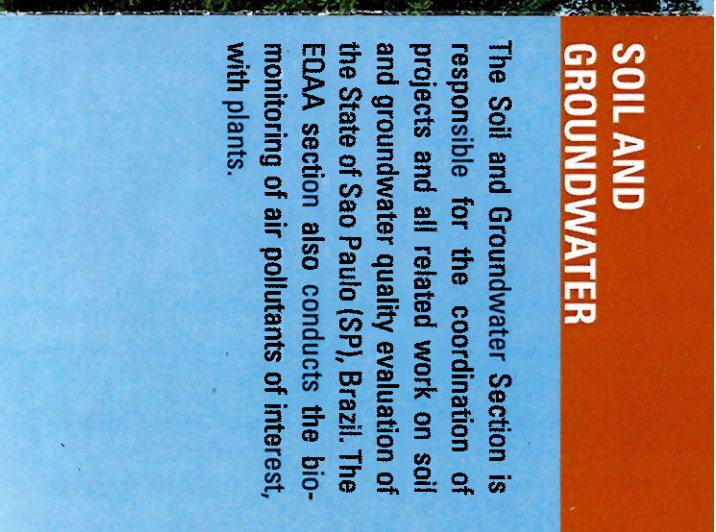
Regional Soil Quality

CETESB/EQAA has also focused on the evaluation of regional soil quality condition. In 2008, it was published the first report on the soil quality condition of the Alto Tietê Watershed, which includes the Metropolitan Region of the city of São Paulo. In this study metals, PAHs and POPs Pesticides were determined in superficial soil samples, both in agricultural and small forest areas. In 2015 it was published the second report on the regional soil quality of Capivari, Piracicaba and Jundiáí Rivers Watersheds, which included PCBs, Dioxins and Furans.



SOIL AND GROUNDWATER

The Soil and Groundwater Section is responsible for the coordination of projects and all related work on soil and groundwater quality evaluation of the State of São Paulo (SP), Brazil. The EQAA section also conducts the bio-monitoring of air pollutants of interest, with plants.



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Soil quality protection

A soil quality management policy can be driven by quality criteria and guidelines for pollution prevention and pollution control. Since 1995, following an international trend, the group has been developing soil quality criteria. These can be based on numerical values, based on the best available scientific knowledge and on the international regulation.

The Soil Guidelines Values (VOs) for the State of Sao Paulo were established combining international methodologies developed in the Netherlands (RIVM), Germany and the United States, adapted to Sao Paulo local conditions. The updated values (2015 VOs) consist of 85 substances, which includes POPs Pesticides, PCBs and Dioxins and Furans. The function of these numerical values is to provide a quantitative approach to a decision making between a preventive or a corrective based action. Accordingly, the soil guidelines values were established for three levels or protection, as follows.



• Quality Reference Value - VRQ

This value indicates a soil with low or no anthropogenic interference, with its natural conditions preserved. It considered the natural occurring substances (eg. metals), and it was based on the analytical results of samples representing the main types of soil in the State of Sao Paulo. The 75 percentile of the analytical results was adopted as the VRQ.

• Prevention Value - VP

The prevention value defines the maximum concentration of a substance, above which harmful changes can take place on the soil and groundwater quality condition. It has the objective to ensure the sustainability of the soil primary functions, protecting most of ecological receptors and the quality of the groundwater. It is an environmental quality management tool which allows that control actions take place to prevent soil contamination. For the establishment of the Prevention Value, three criteria were used: the ecological protection, the groundwater protection and the human health protection.

• Intervention value - VI

This value indicates a limit concentration of substance(s) of interest, above which there may have direct or indirect risk(s) for human health, in the management of contaminated areas. There were defined three different scenarios for intervention values, according to the land use: agricultural, residential and industrial.

As a decision support, these values can help to define, whether a site may pose risk to human health, leading, if necessary, to emergency actions (such as engineering controls to area restriction or to the use of groundwater use, or both, etc.). Following a guidance and legislation on the management of contaminated areas, the values are used in the step of confirmatory investigation, followed by detailed investigation, and the risk assessment. The concentrations were derived using an MS Excel Program, developed at CETESB, based on the USEPA risk assessment methodology, adapted to Sao Paulo local conditions.

