

## **A Model for Determination of Screening Levels for Radioactive Elements in Soil**

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### **Abstract**

At the present, decision about clean-up of Brazilian sites contaminated with radioactive isotopes is addressed on a case-by-case basis, since there is no general guidance or recommendation to support actions in early phases of the problem identification. For chemicals, CETESB - the governmental organization responsible for preventing and controlling environmental pollution in São Paulo State - established quality reference values for prevention and intervention, as the first step to implement a remediation policy based on human health risk assessment. The aim of this study is to develop a methodology for the establishment of target values for radioactive soil contamination, as far as possible consistent and compatible with the approach adopted by CETESB for sites contaminated with chemicals.

The following steps have been addressed in this study: conceptual scenario and model development; codification of the equations in an electronic spreadsheet; selection of proper input values; derivation of the intervention levels for selected radionuclides using Monte Carlo methods. The mathematical model developed was mainly based on the equations used by the U.S. Environmental Protection Agency and by the National Council on Radiation Protection and Measurements for soil screening purposes. Results are presented for selected natural and man-made radioactive isotopes.

***KEYWORDS: soil; radioactive contamination; screening level.***