
Soil quality — Conceptual site models for potentially contaminated sites

*Qualité du sol — Schémas conceptuels de sites pour les sites
potentiellement pollués*

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Foreword

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Any feedback or questions on this document should be directed to the user's national standards body. A complete listing of these bodies can be found at www.iso.org/members.html.

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Introduction

This document provides a definition of the conceptual site model (CSM) for contaminated sites consistent with other ISO standards related to contaminated land. It refers to ISO accepted terminology and generally accepted understanding of a CSM. Links with the ISO 18400 series of standards (*Soil quality — Sampling*) are made. It is applicable to the management of potentially contaminated sites, sites that are known to be contaminated, and also to land with naturally elevated concentrations of potentially harmful substances.

It provides general guidance on the application of CSMs, how they are developed and how they can evolve, with respect to all media, for example, air, surface water, sediments, soil, groundwater, soil gas, biota, subsoil, including buildings and other artefacts.

The CSM is a synthesis of all relevant information about a potentially contaminated site with interpretation as necessary and recognition of uncertainties. The description relies on the concept, of “source-migration pathway-receptor linkages” (sometimes termed « contaminant linkages ») that are, or might be, present.

The investigation of land potentially affected by contamination is usually performed using observations and measurements made on-site as well as by taking samples for laboratory analysis and testing. Soil and groundwater characteristics include a wide span of features, such as chemical and mineralogical composition, soil texture, the concentrations, amounts and distribution of contaminants and soil components. For practical and economic reasons, these investigations cannot cover the total volume of interest, and the on-site measurements and especially the sampling have to be limited to certain points or small areas/volumes.

Spatially limited investigations will give the best possible information if they are planned thoroughly. The questions: “what are we looking for, and what can we expect?” are essential for developing an investigation programme that is efficient and fit for purpose. The best way to start the planning of the investigation is to formulate a CSM, based on a thorough preliminary investigation (desk study and site reconnaissance in accordance with ISO 18400-202) prior to any intrusive investigation.

Therefore, a CSM is a synthesis of information about the site together with some interpretation, assumptions, and hypotheses. By testing the assumptions and hypotheses, intrusive investigations can concentrate on the essential questions and data gaps, and can be planned and carried out more efficiently. Depending on the results of the intrusive investigation, the CSM can be developed further. It can become more detailed, more reliable, and often also modified or corrected, and step by step can lose its conceptual character, although remaining a model.

In the context of potentially contaminated land, a CSM is a tool that can be developed for the planning of an investigation, for undertaking a risk assessment, and for planning remediation and aftercare of a site. It can also be used for construction or other engineering works that are planned for after remediation. A CSM can be used when conducting environmental audits and “due diligence” exercises. The degree of detail needed for the CSM can depend on the objectives of any of these tasks, and the nature, current use and possible development of the site.

When preparing a CSM the terms that are being used should be carefully defined because terms might not be understood to have the same meaning by people with different backgrounds and experience. In addition, CSMs are intended to be of use to those without a technical background.

NOTE This document follows the established convention for documents published by ISO Technical Committee 190 (TC 190) in distinguishing between “contaminant” (“substance or agent present in an environmental medium as a result of human activity – see 3.2 in this document) and pollutant (“substance or agent present in the soil (or groundwater) which, due to its properties, amount or concentration, causes adverse impacts on soil functions” - see ISO 11074:2015, 3.4.18). Hence, “contamination” and “pollution” are not considered to be the same thing. However, it is recognised that this distinction is not always made at “official” level in all jurisdictions. Even in those jurisdictions where it is recognised, it might be for some purposes but not others and the definitions of “contamination” and “pollution” used in legislation and regulations for different purposes can differ. In addition, the use of the terms is not necessarily consistent between and even within guidance documents produced by government and professional bodies.

