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Kakovost tal - Navodilo za izbiro in uporabo presejalnih metod (ISO/DIS 12404:2020)

Soil quality - Guidance on the selection and application of screening methods (ISO/DIS 12404:2020)

Bodenbeschaffenheit - Anleitung für Auswahl und Anwendung von Vor-Ort-Verfahren (ISO/DIS 12404:2020)

Qualité du sol - Lignes directrices pour la sélection et l'application des méthodes de diagnostic rapide (ISO/DIS 12404:2020)

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Soil and waste — Guidance on the selection and application of screening methods

Qualité du sol — Lignes directrices pour la sélection et l'application des méthodes de diagnostic rapide

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Foreword

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The procedures used to develop this document and those intended for its further maintenance are described in the ISO/IEC Directives, Part 1. In particular the different approval criteria needed for the different types of ISO documents should be noted. This document was drafted in accordance with the editorial rules of the ISO/IEC Directives, Part 2 (see www.iso.org/directives).

Attention is drawn to the possibility that some of the elements of this document may be the subject of patent rights. ISO shall not be held responsible for identifying any or all such patent rights. Details of any patent rights identified during the development of the document will be in the Introduction and/or on the ISO list of patent declarations received (see www.iso.org/patents).

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For an explanation on the voluntary nature of standards, the meaning of ISO specific terms and expressions related to conformity assessment, as well as information about ISO's adherence to the World Trade Organization (WTO) principles in the Technical Barriers to Trade (TBT) see the following URL: www.iso.org/iso/foreword.html.

This document was prepared by Technical Committee ISO/TC 190, *Soil quality*.

Guidance on the selection and application of screening methods has been given in two standards for soil and for waste, respectively. These are:

ISO 12404:2011, *Soil quality — Guidance on the selection and application of screening methods*

EN 16123:2013, *Characterization of waste — Guidance on selection and application of screening methods*

The principle for selection and application of screening methods is independent from the matrix to which it is applied. This international standard combines both existing standards which will be withdrawn.

Introduction

This document provides guidance on the use of screening methods for soil, soil-like solids and waste characterization. Most of the following clauses are applicable to all matrices mentioned. However, a few subclauses are specific to waste or soil, including soil-like solid, only.

One field of application of screening methods is “on-site verification” as recommended in the Landfill Directive (1999/31/EC) and the Landfill Decision (2003/33/EC).

Screening methods, which can be chemical, physical or biochemical in nature, can often be applied in a quick and simple manner. Performance of quick and simple tests can be used in the field (i.e. on-site) and, in some cases, are also applicable for laboratory use. They can indicate the presence or absence of an analyte, or provide a qualitative estimate of a parameter such as a concentration or value, or generate a semi-quantitative result.

Screening methods are applicable to processes such as entrance control because, in addition to standardized methods, they allow fast verification of the documented waste characteristics.

Regarding soil, they can also be used to produce a spatial distribution of concentrations or values within a site, which can be supported by subsequent reference (laboratory-base) analysis. When used in this way, the purpose is generally to obtain information on target parameters or groups of parameters and the location of unusual concentrations, possibly prior to undertaking a more detailed study or investigation. In waste investigation, the location of samples is limited to an area where waste is dumped but confirmation of the spatial distribution is still one of investigation purposes, especially when investigating soil-like solid.

The use of screening methods usually increases the efficiency of a site investigation. Generally, many more samples can be analysed or checked for target parameters and results generated faster than determined by conventional testing of laboratory reference methods. Additionally, screening methods, particularly if carried out on-site, can offer an immediate decision-making opportunity which enables staff to direct their efforts more effectively to those areas where a more thorough investigation might need to be undertaken.

NOTE Although soil screening methods are most commonly used to determine contaminants (pollutants) in soils, for example in site investigations, they can also be used to determine parameters in uncontaminated soils (e.g. agricultural soils) The use of the word “contaminant” in this document can equally apply to any relevant soil parameter.

Soil and waste — Guidance on the selection and application of screening methods

1 Scope

This document provides guidance on the selection and application of screening methods for assessing soil quality and waste characterization, including distribution of target parameters in soil and soil-like solid. The aim of this document is to set up criteria as to when the different kind of screening methods may be applied for the analysis of a certain parameter in soil, including soil-like solid, and waste, and which steps are required to prove their suitability.

This document does not recommend any particular screening method but confirms the principles of their selection and application.

2 Normative references

There are no normative references in this document.

3 Terms and definitions

For the purposes of this document, the following terms and definitions apply.

ISO and IEC maintain terminological databases for use in standardization at the following addresses:

— IEC Electropedia: available at http://www.electropedia.org/

— ISO Online browsing platform: available at https://www.iso.org/obp

3.1
screening
application of any analytical semi-quantitative method for exploratory analysis

3.2
screening method
method which is used (often on-site) to quickly explore a given area including target parameter distribution or to test a set of samples and obtain data on sample characteristics

3.3
reference method
method which is performed in accordance with national or international standards and is not necessarily comparable with screening methods

3.4
on-site verification
third level of inspection according to the Landfill Directive and the Landfill Decision to ensure that the waste accepted at a landfill is the same as described in the accompanying documents and that it is in accordance with the basic characterization and/or compliance testing

4 Principles

This document specifies a framework for selection and application of screening methods.

It defines the whole process, from the selection of the screening method, the applicability and fit-for-purpose testing, the fulfilling of the acceptance criteria, the quality control of the applied method, to the documentation of measurement results.

The suitability of any particular screening method depends on the parameter or group of parameters requiring determination and on the technical nature of the method.

5 Typical areas for application of screening methods

Screening methods constitute a useful addition to standard procedures in the following areas.

5.1 Support of sampling/sample preparation processes

Screening methods may be used for:

— selection of the most suitable analytical method (concentration range, interferences, specificity, robustness);

— pre-selection of samples for analysis in the laboratory;

— provision of information about accompanying compounds relevant for sample preparation.

5.2 On-site verification

Characteristics of sampled waste are verified, e.g. during transport or at the entrance of waste treatment plants and landfills.

5.3 Monitoring of processes

Screening methods can be used:

— to monitor and control processes (e.g. success of treatment or remediation);

— to perform quality control on a treatment plant.

5.4 Identification of homogeneity/heterogeneity of bulk material

Screening methods may be applied to measure “target compounds” in large amounts of waste as well as soil and soil-like material to check the degree of homogeneity.

5.5 Survey of contaminated sites (hot-spot identification)

Screening methods are useful to identify contaminated areas in contamination-suspected sites. Examples for the application to contaminated sites is given in Annexes A (flowchart) and B (hot spot detection).

5.6 Identification of sources of contamination

Screening methods can be useful to identify the source of a contaminant (hot spot detection) and its distribution or contamination variability in a material stream or stock-pile.

5.7 Monitoring of large areas

Screening methods may be used for determination of the distribution of key parameters, e.g. nutrients in agricultural land.

5.8 Safety issues

Screening methods can be used to detect potentially toxic compounds (e.g. gases, radioactivity, explosives) which may be hazardous to the personnel taking and processing samples.

6 Selection of a screening method

6.1 General objectives

Before the screening of a site can be conducted, a thorough planning phase is necessary.

First, all information available about the site has to be evaluated. This may be historical records or data available from previous investigations. Essential prerequisites for the suitable preparation of a screening investigation is information about the hydrogeologic situation, the kind of contaminants and parameters of interest and the concentrations or values likely to be expected, as well as any information about the locality, including the former use of the site.

Furthermore, the infrastructure of the site and the accessibility may need to be taken into consideration.

With this background information, data quality objectives have to be defined, that determine the applicability of the screening method. Only with these preliminary steps is the selection of screening methods possible.

Some examples of detailed questions are listed below. This list is not exhaustive and not all might be relevant for a specific site:

— parameters and analytes of interest;

— matrices of interest and condition and variability of matrix;

— data quality objectives;

— parameter values known, expected or already found on-site;

— general spatial extent of relevant parameters;

— ease of sampling;

— site facilities;

— site area;

— number of results per time unit;

— health and safety considerations.

6.2 Selection criteria

The following criteria should be taken into consideration when selecting the appropriate analytical method. The different criteria shall be weighted depending on the intended application. The decision-making process and the results have to be documented by the user (see flowchart in Annex C and documentation aid in Annex D).

Prerequisites are:

— one known parameter or a set of known parameters;

— aim of determination;

— matrix (soil, solid/liquid waste);

— confirmation of parameters' spatial distribution.