Australian Standard®

Guide to the sampling and investigation of potentially contaminated soil

Part 1: Non-volatile and semi-volatile compounds

This Australian Standard was prepared by Committee CH/28, Sampling and Analysis of Soils and Biota. It was approved on behalf of the Council of Standards Australia on 6 June 1997 and published on 5 September 1997.

The following interests are represented on Committee CH/28:

Association of Consulting Engineers, Australia

Australasian Institute of Mining and Metallurgy

Australian Collaborative Land Evaluation Program

Australian Gas Association

Australian Government Analytical Laboratory

Australian Institute of Environmental Health

Australian Institute of Medical Scientists

Australian Nuclear Science & Technology Organization

Australian Society of Soil Science Incorporated

CSIRO - Division of Soils

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Department of Mineral Resources, N.S.W.

Department of Natural Resources, Queensland

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Environment Protection Authority of Victoria

Hunter Area Health Services

Minerals Council of Australia

National Association of Testing Authorities, Australia

Public Health Unit Central and Southern Sydney

Queensland Health Scientific Services

Royal Australian Chemical Institute

University of Sydney

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PREFACE

This Standard was prepared by the Joint Standards Australia/Standards New Zealand Committee CH/28, Sampling and Analysis of Soils and Biota as part of a series on the identification, analytical methods and investigation procedures for the assessment of soil. This Standard is the result of a consensus among representatives on the Joint Committee to produce it as an Australian Standard.

The objective of this Standard is to derive the information which may be required to satisfy regulatory authorities, although additional detail may be required in some localities. The Standard does not prescribe levels of contaminants which are considered to pose a risk to human health or the environment. Such levels are prescribed in documents such as the criteria produced by ANZECC/NHMRC, or various regulatory agencies.

This Standard provides guidance for the sampling and investigation process to professionals engaged in these activities. The professionals should consider the relevance of the various components of this Standard to the particular site under investigation and apply them accordingly. Where site specific issues are raised which are beyond the scope of this Standard, for example where radioactive, unexploded ordnance or pathogenic contamination is suspected, then the relevant expertise should be sought and sampling and investigations targeted accordingly.

The contamination of land and groundwater by chemicals has been well recognized and acted upon in Europe and North America. Because of the relatively short history and low intensity of industrialization in Australia, the number of contaminated sites is far less than for Europe or North America. There is a growing perception in the general community of health risks associated with land contaminated by industrial and agricultural chemicals and processes. These perceived risks may or may not be appropriate, depending upon the amount and quality of information upon which they are based. Unfounded fears may be difficult to dispel whereas ‘real’ risks associated with exposure to hazardous materials may not be fully appreciated.

It is assumed that executing the provisions of this Standard is entrusted to appropriately qualified and experienced people. It calls for the use of procedures that may be hazardous or injurious to health if adequate precautions are not taken. It refers only to technical suitability and does not absolve the user from legal obligations relating to health and safety at any stage.

Contaminated soils may also have an effect on the surrounding environment. Therefore, investigation of air, biota, surface waters and groundwaters should be performed where appropriate.

Procedures for sampling of soils for volatile analytes are not included in this Standard.

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SECTION 1 SCOPE AND GENERAL

1.1 SCOPE This Standard provides guidance for collecting sufficient and reliable information for the assessment of a potentially contaminated site. It includes the formulation of data quality objectives and design of a sampling plan to meet the objectives of the investigation. This Standard does not establish any regulatory limits, remediation requirements or make any recommendations about the proposed land use.

It is however suitable for use in determining compliance with criteria such as those produced by ANZECC/NHMRC* or various regulatory agencies.

NOTE: Appendix A gives information on health and safety aspects when collecting soil samples. This appendix is intended only as a general guide to the issues that should be considered in the development of a site specific occupational health and safety plan.

1.2 REFERENCED DOCUMENTS The following documents are referred to in this Standard:

AS
1726 Geotechnical site investigations

2031 Selection of containers and preservation of water samples for chemical and microbiological analysis

2031.1 Part 1: Chemical

ISO
3696 Water for analytical laboratory use—specification and test methods

1.3 DEFINITIONS For the purposes of this Standard, the definitions below apply.

1.3.1 Composite sample—a sample resulting from the bulking and thorough mixing of soil samples collected from more than one sampling location to form a single soil sample for chemical analyses.

1.3.2 Confidence level—the probability, expressed as a percentage, that a statistical statement is correct.

1.3.3 Contaminated—the state or condition of the site (or area) where the concentration of a contaminant(s) exceeds the investigation value acceptable to the appropriate authority.

1.3.4 Contaminated site—a site where assessment indicates hazardous substances occur at concentrations which pose, or are likely to pose, an immediate or long-term hazard to human health or the environment.

* Australian and New Zealand Guidelines for the Assessment and Management of Contaminated Sites as amended/supplemented by the Australian and New Zealand Environment and Conservation Council and the National Health and Medical Research Council.