AS 4874—2000
Reconfirmed 2018

Australian Standard™

Guide to the investigation of potentially contaminated soil and deposited dust as a source of lead available to humans

Standards Australia

This Australian Standard was prepared by Committee EV/9, Sampling and Analysis of Soils and Biota. It was approved on behalf of the Council of Standards Australia on 29 February 2000 and published on 26 April 2000.

The following interests are represented on Committee EV/9:

Agriculture Victoria

Association of Consulting Engineers, Australia

Australian Collaborative Land Evaluation Program

Australian Government Analytical Laboratory

Australian Institute of Environmental Health

Australian Institute of Medical Scientists

Australian Society of Soil Science Incorporated

CSIRO – Land and Water

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This Standard was issued in draft form for comment as DR 99231.

STANDARDS AUSTRALIA

RECONFIRMATION

OF
AS 4874–2000
Guide to the investigation of potentially contaminated soil and deposited dust as source of lead available to humans

RECONFIRMATION NOTICE

Technical Committee EV-009 has reviewed the content of this publication and in accordance with Standards Australia procedures for reconfirmation, it has been determined that the publication is still valid and does not require change.

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Approved for reconfirmation in accordance with Standards Australia procedures for reconfirmation on 02 May 2018.

The following are represented on Technical Committee EV-009:

Australasian Land & Groundwater Association
Australian Contaminated Land Consultants Association
Chem Centre
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Department of Environment and Science (QLD)
Environmental Laboratory Industry Group
National Association of Testing Authorities Australia
National Measurement Institute
Soil Science Australia
The University of Sydney
University of South Australia

NOTES

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PREFACE

This Standard was prepared by the Joint Standards Australia/New Zealand Committee EV/9, Sampling and Analysis of Soils and Biota as part of a series on the identification, analytical methods and investigation procedures for the assessment of deposited dust and soil. The Standard is the result of consensus among representatives on the Joint Committee to produce it as an Australian Standard.

The Committee acknowledges the assistance of the following documents:

(a) Jason Bawden-Smith, I*dentification and remediation of lead sources in a child's home environment*, Public Health unit for Central and Southern Sydney, 1993.

(b) *Inorganic Lead*. Environment health Criteria No. 165. Geneva: World Health Organization, 1995.

(c) *Toxicological Profile for Lead*. Draft for Public Comment (Update). Atlanta: United States Department of Health and Human Sciences, 1997.

(d) *Sampling House Dust for Lead*. Basic Concepts and Literature Review. Washington: United States Environmental Protection Agency, 1995.

The objective of this Standard is to derive the information that may be required to satisfy regulatory authorities, although additional detail may be required in some situations. The Standard does not prescribe levels of lead, which are considered to pose a risk to human health or the environment. Information on safe levels of lead in environmental media is 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 situation that is being investigated and apply them accordingly. Where site-specific issues are raised, which are beyond the scope of this Standard, the relevant expertise should be sought and investigations targeted accordingly.

The contamination of houses, soil and groundwater by inorganic lead species has been well recognized and acted upon in Europe, North America and Australia. Inorganic lead from house dust and soil poses significant health risk to humans. Infants are known to be the most sensitive group of the population and it is generally acknowledged that their major pathway of uptake is through exposure to house dust.

Exposure to lead can cause intellectual and behavioural disabilities in children. For this reason, there is particular interest in sampling deposited dust from areas, particularly within houses, with which infants would come in contact. Although infants generally do not have significant contact with soil outside a dwelling, this medium may constitute a major pathway of exposure for older children and adults. In general, the layer from which most absorption will occur is the uppermost 20–50 mm.

It is assumed that executing the provisions of this Standard will be entrusted to appropriately qualified and experienced people. The Standard 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 water and groundwaters should be performed where appropriate. In addition, where adverse health effects resulting from house dust or soils contaminated by inorganic lead are suspected, suitable biological monitoring of the affected population should also be carried out.

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1.1 SCOPE

This Guide sets out procedures for the collection of deposited dust and soil samples to ascertain whether inorganic lead is present in sufficient quantities to cause toxicity in humans. Because infants constitute the most sensitive group as regards sublethal lead toxicity, special emphasis is placed upon the collection of samples from areas with which this population group would come into contact.

1.2 REFERENCED DOCUMENTS

AS
4482 Guide to the sampling and investigation of potentially contaminated soil
4482.1 Part 1: Non-volatile and semi-volatile compounds

ISO
3696 Water for analytical use—Specification and test methods

1.3 DEFINITIONS

For the purpose of this Standard, the definitions below apply.

1.3.1 Area concentration

Concentration expressed as mass of dust or lead per unit area.

1.3.2 Cohesive soil

Cohesive soils are plastic soils, i.e. contain clay. When these soils dry out they are very hard. In the field they can only be penetrated one or two centimetres with considerable effort by thumb.

1.3.3 Composite sample

A sample resulting from the bulking and thorough mixing of dust or soil samples collected from more than one location to form a single sample for chemical analysis.

1.3.4 Contaminated

The state or condition of the area, where the concentration of lead exceeds the investigation value acceptable to the appropriate authority.

1.3.5 Contaminated house dust

Surface dust in residential dwellings that contain an area or mass concentration of lead, in excess of the investigation value, which is considered to pose a threat of adverse health effects in the population group likely to come into contact with the material.

