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Investigation of potentially contaminated sites – Code of practice

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31 October 2013	A1: see Foreword
31 December 2017	A2: see Foreword

Contents

Summary of pages
This document comprises a front cover, and inside front cover, pages i to iv, pages 1 to 127, an inside back cover and a back cover.

Foreword

Publishing information

This British Standard was published by BSI Standards Limited, under licence from The British Standards Institution, and came into effect on 31 March 2011. It was prepared by Technical Committee EH/4, *Soil quality*. A list of organizations represented on this committee can be obtained on request to its secretary.

The initial drafting of this British Standard was produced in association with BIS as part of their on-going programme of support for standardization.

Supersession

BS 10175:2011+A1:2013 superseded BS 10175:2011, which has been withdrawn.

BS 10175:2011+A2:2017 supersedes BS 10175:2011+A1:2013, which is withdrawn.

Information about this document

This standard is intended to be read in conjunction with ISO 18400-102, BS ISO 18400-103, BS ISO 18400-104, BS ISO 18400-105, BS ISO 18400-106, BS ISO 18400-107, BS ISO 18400-201, BS ISO 202, and BS ISO 18400-206 which deal with various aspects of investigation and sampling of soil and soil materials to determine quality, not only on land potentially affected by contamination, but also agricultural, natural and near-natural sites.

This edition is consistent with current methodologies and has been updated. Amendment No. 1 was introduced in 2013 to take account of developments in planning, sampling, testing and assessment since the publication of BS 10175:2001 and in particular the publication of BS 8576.

Text introduced or altered by Amendment No. 1 and Amendment No. 2 respectively is indicated in the text by tags ▌A1⟩ ⟨A1▐ and ▌A2⟩ ⟨A2▐. Minor editorial changes are not tagged.

One of the changes introduced in Amendment 1 of BS 10175 was the deletion of Annex I. Annex A in BS 8576 summarizes the regulatory regimes dealing with land contamination with reference to the Part 2A Contaminated Land regime, the Building Control regulations and the planning process. These represent the main contexts in which the investigations for land contamination and for ground gas are carried out following the processes set out in BS 10175.

The primary purpose of Amendment No. 2 is to take into account the publication of the BS ISO 18400 series of standards. However, the opportunity has been taken to make a few minor corrections and amendments, e.g. the formation of Natural Resources Wales and the publication of BS 5930:2015.

It is noted that BS ISO 17924, BS ISO 18400-104, BS ISO 18400-202, BS ISO 18400-205 and BS ISO 18400-206 are informatively referenced in this standard but are yet to be published. It is expected these will be published in 2018.

Presentational conventions

The provisions in this standard are presented in roman (i.e. upright) type. Its recommendations are expressed in sentences in which the principal auxiliary verb is “should”.

The word “may” is used in the text to express permissibility, e.g. as an alternative to the primary recommendation of the clause. The word “can” is used to express possibility**,** e.g. a consequence of an action or an event.

Commentary, explanation and general informative material is presented in smaller italic type, and does not constitute a normative element.

Contractual and legal considerations

This publication does not purport to include all the necessary provisions of a contract. Users are responsible for its correct application.

Compliance with a British Standard cannot confer immunity from legal obligations.

In particular, attention is drawn to the following primary legislation and statutory regulations.

- The Environmental Protection Act 1990, as amended [1];
- The Contaminated Land (Wales) Regulations 2006 [2];
- The Contaminated land (Scotland) Regulations 2000, as amended [3];
- The Contaminated Land (England) Regulations 2006 [4];
- The Environment Act 1995 [5];
- The Radioactive Contaminated Land (Modifications of Enactments) (England) Regulations 2006 [6];
- The Radioactive Contaminated Land (Modifications of Enactments) (Wales) Regulations 2006 [7];
- The Radioactive Contaminated Land (Scotland) Regulations 2007, as amended [8];
- The Water Resources Act 1991, as amended [9];
- The Water Act 2003 [10];
- The Water Environment and Water Services (Scotland) Act 2003 [11];
- The Water (Northern Ireland) Order 1999 [12];
- The Wildlife and Countryside Act 1981 [13];
- The Conservation (Natural Habitats, etc.) Regulations 1994 [14];
- The Town and Country Planning Act 1990 [15];
- The Town and Country Planning (Scotland) Act 1997 [16];
- The Building Control Act 1990 [17];
- The Construction Design and Management (CDM) Regulations 2015 [18];
- The Control of Substances Hazardous to Health (COSHH) Regulations 2002 [19];
- The Factories Act 1961 [20];
- The Offices, Shops and Railway Premises Act 1963 [21];
- The Health and Safety at Work, etc. Act 1974 [22];
- The Pollution Prevention and Control Act 1999 [23];
- The Control of Pollution Act 1974, as amended [24];
- The Environmental Damage (Prevention and Remediation) Regulations 2009 [25];
- The Environmental Damage (Prevention and Remediation) (Wales) Regulations 2009 [26];
- The Environmental Liability (Scotland) Regulations 2009 [27];
- The Environmental Protection (Duty of Care) Regulations 1991 [28];
- The Environmental Permitting (England and Wales) Regulations 2007 [29];

- The Pollution Prevention and Control (Scotland) Regulations 2000 [30].

Introduction

The recommendations and guidance of this British Standard are applicable to the investigation of all potentially contaminated sites and also to land with naturally elevated concentrations of potentially harmful substances.

A2 BS 10175 is to be used in conjunction with other relevant standards, in particular BS 8576 and the BS ISO 18400 series of standards (see NOTE 4). A2

The management of land potentially affected by contamination involves identifying risks arising from the presence of contaminants in order that appropriate action can be taken. The risk assessment of a potentially contaminated site requires a variety of information, including:

a) details of the historical uses of the site and surrounding area and the potential for the presence of contaminants (the potential sources);

b) identification of who or what could be affected by the contaminants (i.e. receptors);

c) information on the pathways by which contaminants could migrate or come into contact with receptors (including details of any physical characteristics of the site that will affect contaminant movement).

This information is gathered by a process of site investigation as set out in this standard.

The results of the investigation ought to delineate all known aspects of the site that could impinge upon or affect source-pathway-receptor scenarios defined within the conceptual model.

The conceptual model is a description and/or representation of the site, incorporating what is known about the ground and groundwater conditions; the actual and potential contamination; the physical conditions and environmental setting; the receptors; and potential pathway linkages between contamination sources and receptors.

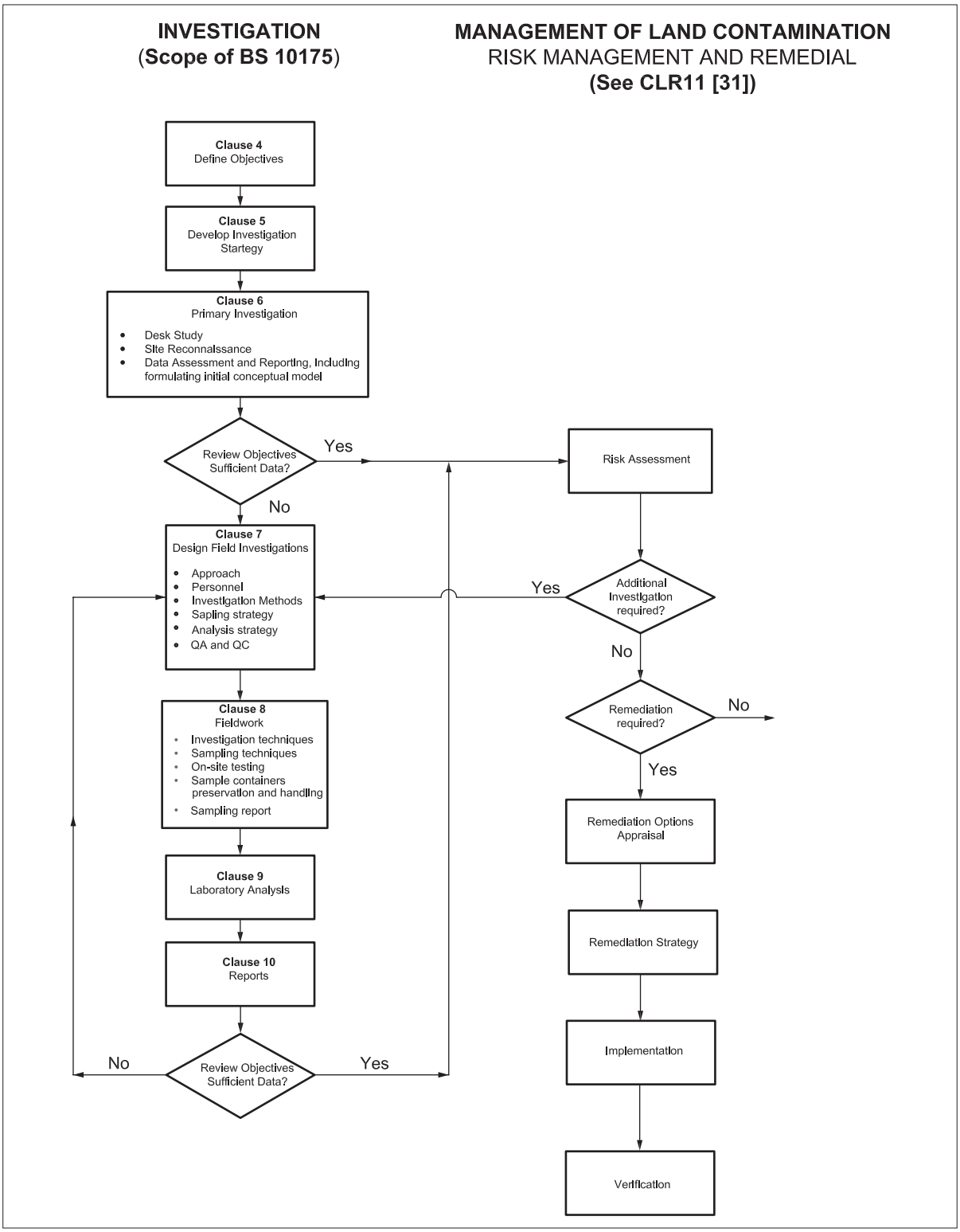
Depending upon the objectives of the investigations, it could be relevant to consider new future receptors associated with the construction and completion of a new development, as well as existing receptors. The conceptual model leads to the formulation of contamination-related hypotheses, which the investigation process examines through the collection of relevant data.

The conceptual model is first formulated during the preliminary investigation (desk study) and informs subsequent investigations, if these are necessary, to meet the objectives of the overall investigation. One of the objectives will be reduction of uncertainty in the conceptual model.

The process of investigation involves a number of phases and typically begins with setting the objectives of the investigation. At the end of each phase of investigation, the information obtained is reviewed to determine whether the objectives have been met or there is a need for further investigation, and to address data gaps or uncertainties in the conceptual model. Where further investigation is necessary, the design of the next phase is based on, and utilizes, the information previously obtained.

The process of investigation, and how it relates to the management of land potentially affected by contamination, is illustrated in Figure 1. The recommendations of this standard are presented in the sequence of steps that are to be followed in the investigation process, and Figure 1 indicates which clause refers to each step. Annex A provides examples of how the recommendations of this standard can be applied.

Figure 1 — *Site investigation process in the management of land potentially affected by contamination*



The use of the conceptual model to assess the need for remedial action of land affected by contamination is a part of the risk assessment process. Guidance on how to carry out a risk assessment is outside the scope of this standard.

NOTE 1 Guidance on the management of contaminated land has been published by the Department of the Environment, Food and Rural Affairs (Defra) and the Environment Agency [31]. This gives guidance on the assessment of land known to be or potentially affected by contamination and can be used in conjunction with the recommendations of this standard. Particular attention is drawn to chapter 2, Risk Assessment.

NOTE 2 Some requirements for investigation lie beyond the needs of a risk assessment, for example, a sampling scheme for remediation verification or the selection and detailed design of a remediation scheme. In such situations the procedures and methods described in this standard can be used to design the relevant investigation.

A1 *NOTE 3 Guidance on investigations for Volatile Organic Compounds (VOCs) and permanent gases such as methane and carbon dioxide, is provided in BS 8576, which has been prepared to be used in conjunction with this British Standard.* A1

A2 *NOTE 4 The ISO 18400 series of standards is intended to cover all situations where soil samples are to be collected for determination of soil quality. The standards in the series are not only relevant to the investigation of potentially contaminated sites but also, for example, to the investigation of natural, near-natural and agricultural sites (see for example BS ISO 18400-205). In the case of agricultural sites, the intent could be to assess soil fertility and in the case of natural sites to determine properties related to carbon sequestration. The thinking underlying the series and the structure of the series is described in BS ISO 18400-100.*

NOTE 5 ISO 18400-203 and ISO 18400-204 have not been adopted as British Standards because they overlap respectively with this standard and BS 8576. The guidance the two standards contain is generally compatible with the guidance in the corresponding British Standard.

NOTE 6 Some of the terminology used in the ISO 18400 series differs from that in BS 10175. For example, "conceptual site model" is used where "conceptual model" is used in this standard. Some of these differences are noted in the amended text. There are also some differences in how terms are used in BS 10175 and BS 5930 and some minor editorial differences between the formal definitions for some terms in different members of the ISO 18400 series of standards. A2

1 Scope

This British Standard gives recommendations for, and guidance on, the investigation of land potentially affected by contamination and land with naturally elevated concentrations of potentially harmful substances, to determine or manage any risks. It covers:

a) setting the objectives of an investigation;

b) developing a strategy for the investigation;

c) designing the different phases of the investigation;

d) sampling and field testing;

e) laboratory analysis;

f) reporting,

in order to obtain scientifically robust data on soil, groundwater, surface water and ground gas contamination.

It is intended for use by those with an understanding of the risk-based approach to the assessment of sites (as described in the Model Procedures for the Management of Land Contamination (CLR 11) [31]).

The relevant recommendations and guidance within this standard are intended to ensure that the objectives of an investigation are achieved and that appropriate data for the risk assessment are obtained. However, it is not feasible to provide detailed guidance for every possible investigation scenario.

This British Standard does not give:

1) guidance on certain constraints or problems that can affect a site, such as geotechnical aspects (which are covered by BS 5930);

2) guidance on legal aspects, including the need for licences and permits, etc.;

