

GEOENVIRONMENTAL STANDARDS FOR SOIL & SITE ASSESSMENT – 15 November 2021
An Occasional Newsletter

To: **National Brownfield Forum**

Please feel free to pass on to any of your contacts who might be interested.

INTRODUCTION

BSI EH4 Soil Quality is the BSI technical committee responsible for the production of standards relating to soil quality including contaminated land and natural and near-natural sites (e.g. farm land). Standards cover sampling, chemical analysis, physical testing, biological testing, and soil and site assessment. EH4 also deals with standards for the analysis and testing of wastes, standards relating to soil and climate change, and ecosystem services.

BSI EH4 shadows ISO (International Organization for Standardization) Technical Committee *TC 190-Soil Quality* and CEN *TC444-Environmental characterization of solid matrices*. CEN is the European standards organisation.

EH4 actively seeks to broaden its membership. The wider the membership, the greater the confidence that the standards produced are technically sound and known about by potential users from a wide variety of backgrounds. Participation in BSI, CEN and ISO committees can contribute to CPD. Contact the Committee Manager, Jessy Mathew (jessy.mathew@bsigroup.com) for more information.

Mike Smith



NEW CEN WORKING GROUP ON SAMPLING

CEN TC444 WG7-Sampling, which will hold its first meeting on December 2nd, will focus on maintenance of European standards (ENs) on sampling wastes inherited from CEN TC292. These standards support implementation of the European Directive on wastes (and the UK equivalent). The WG will not concern itself with standards for sampling soils which is covered by the ISO 18400 series. Any revised standards will become British Standards. An expert or experts are needed to support UK participation in the WG. Contact the Committee Manager, Jessy Mathew (jessy.mathew@bsigroup.com) if you think you might like to volunteer.

Note: This is not necessarily a complete listing of on-going projects in ISO TC190 and CEN TC444. At any one time there are also likely to be a number of other chemical analytical, biological testing, geotechnical and ground engineering standards, progressing through the ISO/CEN/BS system.

ISO TC190 and CEN TC444 MEETINGS, SEPTEMBER & OCTOBER 2021

ISO TC190, its Sub-committees (SCs), and some Working Groups (WGs) held meetings during September and October as did some CEN TC444 WGs. UK participation was limited due to the lack of “experts” willing to participate in the meetings.

CONSOLIDATION OF ANALYTICAL PRETREATMENT STANDARDS

TC444/WG6 has begun consideration of how a number of International and European standards can be consolidated into a single standard. Adoption of proper procedures to produce the very small amount of material that is actually analysed from the field sample delivered to the laboratory are essential if consistent results are to be produced and in-laboratory and inter-laboratory variability kept within acceptable bounds. A first draft working document is expected to be available in Spring next year.

It is proposed to model the draft standard on *[BS] EN 16179:2012 Sludge, treated biowaste and soil - Guidance for sample pretreatment*. A particular issue to be addressed is the relationship between the minimum sample mass required and particle size. The standards are not consistent on this and work to prepare ISO 18400-104 *Soil quality – Sampling* suggests that the theory underlying this may not have been properly applied. The standard will leave scope for laboratories to develop and use “fit for purposes” procedures for pretreatment. The seven standards of interest are:

- BS ISO 11464: 2006** Soil quality –Pretreatment of samples for physio-chemical analyses
- BS ISO 14507:2003** Soil quality -- Pretreatment of samples for the determination of organic contaminants
- BS EN 15002:2015** Characterization of waste - Preparation of test portions from the laboratory sample
- BS EN 16179:2012** Sludge, treated biowaste and soil - Guidance for sample pretreatment.
- BS EN ISO 16720:2007** Soil quality – Pretreatment of soil samples by freeze drying for subsequent analysis
- BS EN 17087:2019** Construction products - Assessment of release of dangerous substances - Preparation of test portions from the laboratory sample for testing of release and analysis of content.
- BS ISO 23909:2008** Soil quality – Preparation of laboratory samples from large samples.

BS ISO 18512:2007 *Soil quality – Guidance on long and short term storage of samples*, which is due for routine review next year, is also in need of revision.

It would be helpful to know at this stage if there is anyone with a particular interest who would like to participate in this project which will be carried out in conjunction with ISO TC190/SC3.

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ASBESTOS

ISO TC190/SC3 Chemical and physical characterization and *CEN/TC 444/WG3* both have an interest in production of standards related to the determination of asbestos concentrations in granular materials including sampling and analysis.

CEN TC351-Construction products (shadowed by BSI B557 - *Construction products - Assessment of dangerous substances*) held webinars on asbestos in construction materials (this includes bulk materials such as aggregates from wastes) on 3 May and 14 June. TC 351/WG5 has now started work on production of a draft document with a dedicated Working Group meeting planned for 1 December.

This project will be dealt with in the UK by BSI committee B557. However, liaison has been established with EH4 with the intent of trying to ensure wider UK participation in the work than might otherwise be the case.

ISO TC 190/WG3 - SOIL FUNCTIONS/ECOSYSTEM SERVICES

The new ISO TC190 Working Group (ISO TC190/WG3) met for the first time in March. The second meeting was held on 7 October. Two task groups have been set up: (1) definition and framework – this will be co-led by Dr Liz Lakin from the UK, and (2) soil functions/services and associated indicators/parameters. There are opportunities for more UK experts to join the Working Group.

BSI EH4 has decided in principle to set up a specialist Sub-committee to enable those involved in related activities in the UK to better engage the work of TC190/WG3.

BS1377

BS 1377-3:2018+A1:2021- Methods of test for soils for civil engineering purposes. Chemical and electro-chemical testing has been published.

The laboratory soil tests in BS 1377:1990 Parts 2, 4, 5, 6, 7 and 8 are consolidated in the draft British Standard *BS 1377-2 Methods of test for soils for civil engineering purposes, Part 2-Classification tests and determination of physical properties* recently published for public comment. The comment period ended on 23 October.

This work is part of the programme of BSI committee B536/3-*Ground investigation and ground testing*. B526/3 is responsible for the UK input to national, European and international standards, in particular Eurocode 7 parts 2 and 3, along with Eurocodes related material including the extensive series of testing standards developed by CEN/TC 341 and ISO/TC 182. BSI provides the Secretariat for both of these international committees.

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SOIL HUB

The on-line hub for 'all things soil' ([uksoils](#)) brings together the best available resources, including educational information and school activities, books and films, data and maps, plus guidance for farmers and land managers on how to support healthy soils. It is also a forum to enable the sharing of knowledge and experiences, encouraging people to link up and carry out initiatives to improve soil health and share locations around the country where soil health pioneers are trying out new technologies and management practices.

The hub is supported by a partnership comprising the UK Centre for Ecology & Hydrology (UKCEH), the Sustainable Soils Alliance, Earthwatch, the University of Sheffield, the British Soil Science Society and Scotland's Rural College (SRUC).

Standards Relating to Investigation, Assessment, Remediation and Development of Potentially Contaminated and Contaminated Sites

This AGS document provides key information required for a proper understanding and use of Standard Guidance documents and Standard Specifications. It also provides information about in which Standards guidance on various topics such as investigation, reporting and remediation can be found. It can be downloaded from:

<https://www.ags.org.uk/item/standards-relating-to-investigation-assessment-remediation-and-development-of-potentially-contaminated-and-contaminated-sites/>

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<i>Drafts - New or amended entries – Early March to 31 December 2020</i>
<i>Drafts -New or amended entries – 1 January to 31 March 2021</i>
<i>Drafts - New or amended entries – 1 April -30 June 2021</i>
<i>Drafts - New or amended entries – 1 – 31 July 2021</i>
<i>Drafts - New or amended entries – 1-31 August 2021</i>
<i>Drafts - New or amended entries – 1-30 September 2021</i>
<i>Drafts - New or amended entries – 1-31 October 2021</i>
<i>Drafts - New or amended entries – 1-30 November 2021</i>
<i>Published standards – 1-31 August 2021</i>
<i>Published standards – 1-30 September 2021</i>
<i>Published standards – 1-31 October 2021</i>
<i>Published standards – 1-30 November 2021</i>

ISO terminology: NWIP = New Work Item Proposal, WD = Working Draft, CD = Committee Draft, DIS = Draft International Standard, FDIS = Final Draft International Standard.

CEN terminology: prEN =enquiry stage (equivalent of DIS), FprEN = for Final Vote (equivalent of FDIS)

Copies of draft standards are available from the representatives of organisations that are members of the BSI Technical Committee concerned. In the case of EH4, these include for example, AGS, EIC, SCI (see “background” note at the end of this Newsletter for other members). If you do not know who represents an organisation to which you belong, you need to ask the organisation – this is not information that BSI is permitted to supply. However, in some cases I can supply copies for review. The BSI Committee Manager might also be willing to supply a copy.

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RECENTLY PUBLISHED STANDARDS		
BS EN ISO 11916-3:2021	Soil quality – Determination of selected explosives and related compounds – Part 3: Method using liquid chromatography-tandem mass spectrometry (LC-MS/MS)	Published November 2021
BS 1377-3:2018+A1:2021	Methods of test for soils for civil engineering purposes. Part 3: Chemical and electro-chemical testing <i>(replaces BS 1377-3:2018)</i>	September 2021
BS EN 15935:2021	Soil, waste, treated biowaste, and sludge – Determination of loss on ignition <i>(replaces BS EN 15169:2007 and BS EN 15935:2021)</i>	Published August 2021
BS EN ISO 2475-1:2021	Geotechnical investigation and testing – Sampling methods and groundwater measurements –Part 1: Technical principles for sampling of soil, rock and groundwater	Published November 2021
BS EN ISO 17892-12:2018+A1:2021	Geotechnical investigation and testing – Laboratory testing of soil – Part 12: Determination of liquid and plastic limits <i>(Replaces BS EN ISO 17892-12:2018)</i>	Published September 2021
BS EN ISO 22476-4:2021	Geotechnical investigation and testing – Field testing –Part 4: Prebored pressure test by Ménard procedure <i>(replaces BS EN ISO 22476-4:2012)</i>	Published September 2021
[bsi] PD CEN ISO TS 29843-2:2021	Soil quality – Determination of soil microbial biodiversity – Part 2: Method by phospholipid fatty acid analysis (PLFA) using the simple PLFA extraction method <i>(replaces [bsi] PD CEN ISO TS 29843-2:2014)</i>	Published August 2021

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BSI PROJECTS		
DPC BS 1377-2	Will cover those tests in Parts 2-8 of BS 1377:1990 that have not been replaced by Parts 1 to 12 of BS EN ISO 17892 or BS 1377-3:2018.	Comment period on Draft for Public Comment period ended 23 October 2021
PAS 128 (revision)	Underground utility detection, verification and location – Specification	Publication hopefully by the end of 2021.
DRAFT ISO/CEN GEOTECHNICAL STANDARDS		
<i>These standards form part of the programme of work of BSI committee B526/3.</i>		
ISO 17892-12:2018/DAM1	Geotechnical investigation and testing – Laboratory testing of soil – Determination of liquid and plastic limits – AMENDMENT 1	Comment period ended 5 April 2021
NWIP EN ISO 18674-7	Geotechnical investigation and testing – Geotechnical monitoring by field instrumentation – Part 7: Measurement of strains: Strain gauges	Approved to proceed by ISO TC 182 & CEN TC351 in June 2021
NWIP EN ISO 18674-8	Geotechnical investigation and testing – Geotechnical monitoring by field instrumentation – Part 8: Measurement of forces: Load cells	Approved to proceed by ISO TC 182 & CEN TC351 in June 2021
ISO DIS 22476-1	Geotechnical investigation and testing – Field testing – Part 1: Electrical cone and piezocone penetration test	Comment period ended on 7 July 2021
ISO CD 22477-2	Geotechnical investigation and testing – Testing of geotechnical structures – Part 2: Testing of piles: static tension load test	Comment period ended August 2021
ISO CD 24057	Array measurement of microtremors to estimate shear wave velocity profile	Comment period ended 8 March 2021

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DRAFT ISO & CEN STANDARDS ON SOIL & SITE ASSESSMENT Etc. <i>These standards form part of the programme of work of BSI committee EH4</i>		
ISO CD 18400-301	Soil quality – Sampling - Sampling for volatiles and on site semi-quantitative determination in field investigations	Comment period on CD ended March 2021. Proceeding to DIS
ISO FDIS 23400	Guidelines for the determination of organic carbon and nitrogen stocks and their variations in mineral soil at plot scale	Proceeding to publication
ISO CD 24212	Remediation techniques applied at contaminated sites	Comment period on CD ended March 2021. Second CD to be prepared.

DRAFT ANALYTICAL AND BIOLOGICAL TESTING STANDARDS etc. <i>These standards form part of the programme of work of BSI committee EH4</i>		
ISO CD 4974	Soil quality – Guidance on soil temperature measurement	Proceeding to DIS
ISO CD 5120	Soil quality – Determination of perchlorate in soil using liquid chromatography-mass spectrometry	Comment period ended 2 March 2021
ISO CD TS 5594	Guidance document on designing interlaboratory trial for validation of biotests	Comment period ended 7 June 2021
ISO FDIS 10390 CEN FprEN 10390	Soil, sludge and treated biowaste – Determination of pH <i>(will replace certain other ENs)</i>	Proceeding to publication
ISO CD 11267	Soil quality – Inhibition of reproduction of <i>Collemba (Folsomia candida)</i> by soil contamination <i>(will replace BS EN ISO 11267:2014)</i>	Comment period ended 28 August
ISO CD 11268-2 Revision of [BS] ISO 11268-2:2012	Soil quality – Effects of pollutants on earthworms – Part 2: Determination of effects on reproduction of <i>Eisenia fetida/Eisenia andrei</i>	Comment period ended 27 January 2021
ISO DIS 13914	Soil, treated biowaste and sludge – Determination of dioxins and furans and dioxin-like polychlorinated biphenyls by gas chromatography with high resolution mass selective detection (HR GC-MS)	Comment period ends 30 November 2021
CEN FprEN 14735	Characterization of waste – Preparation of waste samples for ecotoxicity tests	Proceeding to publication

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CEN FprEN 15216	Environmental matrices – Determination of total dissolved solids (TDS) in water and eluates – Complementary element	Comment period ended 31 May 2021
CEN FprEN 15936	Sludge, treated biowaste, soil and waste – Determination of total organic carbon (TOC) by dry combustion	Comment period ended 4 November 2021
CEN FprEN 16166	Soil, treated biowaste, sludge – Determination of adsorbed organically bound halogens (AOX)	Comment period ended 10 October 2021
ISO CD 16387	Soil quality – Effects of pollutants on Enchytraeidae (<i>Enchytraeus sp.</i>) – Determination of effects on survival reproduction (revision of BS EN ISO 16387:2014)	Comment period ended 5 September 2021
CEN FprEN 17503	Environmental solid matrices – Determination of polycyclic aromatic hydrocarbons (PAH) by gas chromatography (GC) and high performance liquid chromatography (HPLC) (will supersede EN 15527:2008 & EN16181:2018)	Comment period ends 22 November 2021
CEN prEN 17505	Soil and waste characterization – Temperature dependent differentiation of total carbon (TOC400, ROC, TIC900)	2 nd enquiry completed. Proceeding to next stage
CEN prEN 17516	Waste – Characterization of granular solids with potential for use as construction material – Compliance leaching test – Up-flow percolation test	Enquiry on FprEN pending
ISO DIS 21268-5	Soil quality – Leaching procedures for subsequent chemical and ecotoxicological testing of soil and soil-like materials – Part 5: Batch test with forced aerobic or anaerobic conditions	Closing date for comments 12 January 2022
ISO NP 22036	Soil treated biowaste and sludge – Determination of elements using inductively coupled plasma optical emission spectrometry (ICP-OES)	Subject to approval by CEN
ISO DIS 23611-4	Soil quality - Sampling of soil invertebrates – Part 4: Sampling, extraction and identification of soil-inhabiting nematodes	Comment period ends 27 November 2021
ISO FDIS 23646	Soil quality – Determination of organochlorine pesticides by gas chromatography with mass selective detection (GC-MS) and gas chromatography with electron—capture detection (GC-ECD)	Comment period on FDIS ended 14 Nov 2021.
ISO DIS 23992	Soil quality – Framework for the recording and monitoring of changes in dynamic soil properties	Proceeding to FDIS
ISO FDIS 24032	Soil quality - In-situ caging of snails to assess bioaccumulation of contaminants	Comment period ended 24 October 2021

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NEW WORK ITEM PROPOSALS SUBJECT TO APPROVAL BY CEN TC444 and/or ISO TC190		
CEN NWIP	Characterization of environmental solid matrices – Halogen and sulfur by oxidative pyrohydrolytic combustion followed by ion chromatography detection and complementary determination methods	Approved by CEN, June 2021
CEN NWIP 444044	Characterization of waste - Determination of the content of elements and substances in waste	Approved by CEN, May 2021
ISO NP 18227	Environmental solid matrices – Determination of elemental composition by X-ray fluorescence spectrometry <i>Proposed merger of [BS] ISO 18227 and [BS] EN 15309</i>	Comment period ended 16 January 2021
CEN NWIP	Environmental characterization of leachates from waste and soil using reproductive and toxicological gene expression in <i>Daphnia magna</i>	Approved March 2021
ISO NP 16965	Environmental solid matrices – Determination of elements using inductively coupled mass spectrometry (ICP-MS) <i>Includes merger of ISO TS16965 & EN 16171</i>	Subject to CEN & ISO approval Deadlines for comment: ISO 2 October CEN 23 November
ISO NWIP 7303	Soil quality – Simplified method for oral bioaccessibility of metal(loids) in soils <i>Will complement BS ISO 17924 – see also NWIP 8529</i>	Comment period ended 25 April 2021. Not approved due to lack of nominated experts. New ballot to be held.
ISO NP 18227	Environmental soil matrices – Determination of elemental composition by X-ray fluorescence spectrometry <i>Includes merger of ISO 18277 and EN 15309</i>	Subject to CEN & ISO approval Deadlines for comment: ISO 2 October CEN 23 November
ISO NWIP 8529	Soil quality – Bioaccessibility of organic and inorganic pollutants from contaminated soil and soil-like material <i>Will be based on DIN 19738 and complement BS ISO 17924 – see also NWIP 7303</i>	Approved September 2021
CEN WI 444239	Characterization of waste – Determination of selected low boiling point alcohols using gas chromatography with flame ionization detection after static head-space extraction (HS_GC_FID)	

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Background

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BSI EH4 shadows ISO (International Organization for Standardization) Technical Committee *TC 190 Soil Quality* and CEN TC444 (*Environmental characterization of solid matrices*). CEN is the European standards organisation. EH4 has recently assumed responsibility for European standards (ENs) for analysis and testing of wastes produced by CEN TC444.

EH4 is also responsible for BS10175 (investigation of contaminated sites), BS 8576 (ground gas investigations), BS8454 (protection of buildings against gas) and BS 1076 (soil sampling for VOC determination of VOCs).

There are about twenty organisations (e.g. trade bodies, learned societies, professional bodies, quasi-government bodies etc.) represented on the committee at present together with a handful of individual experts who represent the UK on various ISO and CEN Working Groups (e.g. Paul Nathanail, Mike Ramsey). To find out who represents a particular organisation, the organisation should be contacted.

Nominated representatives of member organisations receive copies of formal drafts of standards, known in the case of ISO as Committee Drafts (CDs), Draft International Standards (DISs) and Final Draft International Standards (FDISs); and in the case of BSI as Drafts for Public Comment. They also receive copies of published standards for personal use.

Those representing an organisation are expected to circulate papers to, and consult, those they represent. Draft standards can be posted on “members-only” sections of web-sites for downloading or can be e-mailed to all members of the organisation that is represented.

EH4 actively seeks to broaden its membership. The wider the membership of EH4, the greater the confidence there can be that the standards produced are technically sound and known about by potential users from a wide variety of backgrounds. It also increases the pool of people from which it might be possible to draw on from time to time to represent the UK in ISO and CEN Working Groups. BSI can nominate one or more experts to each of the numerous Working Groups in ISO TC190 and CEN TC444. Whilst experts will hopefully attend meetings of the WGs, in practice this is not always possible and participation is limited to receipt and review of papers. BSI makes a contribution towards the costs of UK experts attending ISO and CEN meetings.

Member organisations of EH4 include:

Association of Geotechnical and Geoenvironmental Specialists (AGS), British Society of Soil Science, Centre for Ecology & Hydrology, Chartered Institute of Environmental Health, Environment Agency, Environmental Industries Commission (EIC) , EIC Contaminated Land Working Group, Environmental Services Association, Institution of Environmental Sciences, Ministry of Defence, National House Building Council (NHBC), Royal Society of Biology, Society of Brownfield Risk Assessment (SOBRA), Society of Chemical Industry (SCI), the James Hutton Institute, University of Glasgow, Water UK, Yorkshire & Lincolnshire Pollution Advisory Group.

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