Deutsche Akkreditierungsstelle GmbH

Annex to the accreditation certificate D-PL-14087-01-00 according to DIN EN ISO/IEC 17025:2018

Valid from: **22 February 2022**

Date of issue: 17 May 2022

Holder of certificate:

A.W.V. - Dr. Busse GmbH
Jößnitzer Straße 113, 08525 Plauen

Tests in the fields:

Physical, physico-chemical and chemical analysis of water (groundwater, leachate, drinking water, waste water, swimming pool and bathing pool water, surface water and cooling water), sludge and sediments
Physical, physico-chemical and chemical analysis of soils and their eluates and of waste and waste eluates
Selected chemical analysis of drinking water in accordance with the German Drinking Water Ordinance, sampling of raw and drinking water
Analysis of solid fuels, recovered fuels and biofuels
Selected analysis of plastics and coating materials
Sampling of waste water, swimming pool and bathing pool water, water from barrages and lakes, from aquifers and running waters, of sludges, sediments, soils, sewage sludge, compost, and of waste and materials for recycling
Sampling, sample preparation and analysis of waste in accordance with the German Landfill Ordinance, Annex 4;
Specialist modules for water, soil, contaminated sites and waste

The management system requirements of DIN EN ISO/IEC 17025 are written in the language relevant to the operations of testing laboratories. Laboratories that conform to the requirements of this standard operate generally in accordance with the principles of DIN EN ISO 9001.

The certificate together with the annex reflects the status as indicated by the date of issue. The current status of any given scope of accreditation can be found in the directory of accredited bodies maintained by Deutsche Akkreditierungsstelle GmbH (DAkkS) at https://www.dakks.de/en/accredited-bodies-search.html

Within sections 1 and 3 to 6, the testing laboratory is permitted to apply the listed standardised or equivalent test methods with different versions without obtaining prior notification and consent from DAkkS.

The testing laboratory has an up-to-date list of all test methods within the flexible scope of accreditation.

1 Analysis of water (groundwater, leachate, drinking water, waste water, swimming pool and bathing pool water, surface water and cooling water)

1.1 Sampling and sample preparation

DIN EN ISO 5667-1 (A 4) 2007-04	Water quality – Sampling – Part 1: Guidance on the design of sampling programmes and sampling techniques
DIN ISO 5667-5 (A 14) 2011-02	Water quality – Sampling – Part 5: Guidance on sampling of drinking water from treatment works and piped distribution systems
DIN 38402-A 19 1988-04	Sampling of swimming pool and bathing pool water
DIN EN ISO 5667-3 (A 21) 2004-05 and Corrigendum 1 2006-08	Water quality – Sampling – Part 3: Guidance on the preservation and handling of water samples
ISO 5667-4 1987-04	Water quality – Sampling – Part 4: Guidance on sampling from lakes, natural and man-made
ISO 5667-10 1992-11	Water quality – Sampling – Part 10: Guidance on sampling of waste waters
ISO 5667-11 1993-03	Water quality – Sampling – Part 11: Guidance on sampling of groundwaters
ISO 5667-18 2001-04	Water quality – Sampling – Part 18: Guidance on sampling of groundwater at contaminated sites
DIN EN ISO 5667-6 2016-12	Water quality – Sampling – Part 6: Guidance on sampling of rivers and streams
DIN EN ISO 15587-2 2002-07	Water quality – Digestion for the determination of selected elements in water – Part 2: Nitric acid digestion

DIN 4030-2 1991-06	Assessment of water, soil and gases for their aggressiveness to concrete; collection and examination of water and soil samples
DIN 19643-1 2012-11	Treatment of water of swimming pools and baths – Part 1: General requirements (*Here implementation of sampling*)
DVGW Work Sheet W 551 2004-04	Drinking water heating and drinking water piping systems – Technical measures to reduce Legionella growth – Design, construction, operation and rehabilitation of drinking water installations (*Here implementation of sampling*)
UBA Recommendation 2018-12	Systematic analysis of drinking water installations for legionella in accordance with the German Drinking Water Ordinance
UBA Recommendation 2018-12	Assessment of the quality of drinking water with respect to the parameters lead, copper and nickel

1.2 Physical and physico-chemical methods

DIN EN ISO 10523 (C 5) 2012-04	Water quality – Determination of pH
DIN 38404-C 10 2012-12	Calculation of the calcite saturation of water

1.3 Anions

DIN 38405-D 4 1985-07	Determination of fluoride
DIN EN ISO 14403 (D 6) 2002-07	Water quality – Determination of total cyanide and free cyanide by continuous flow analysis
DIN EN ISO 6878 (D 11) 2004-09	Water quality – Determination of phosphorus – Ammonium molybdate photometric method
DIN 38405-D 13 2011-04	Determination of cyanides

DIN EN ISO 10304-1 (D 20) 2009-07	Water quality – Determination of dissolved anions by liquid chromatography of ions – Part 1: Determination of bromide, chloride, fluoride, nitrate, nitrite, phosphate and sulphate
DIN EN ISO 10304-4 (D 25) 1999-07	Water quality – Determination of dissolved anions by liquid chromatography of ions – Part 4: Determination of chlorate, chloride and chlorite in water with low contamination
DIN 38405-D 27 1992-07	Determination of readily liberated sulphide
DIN EN ISO 18412 (D 40) 2007-02	Water quality – Determination of chromium(VI) – Photometric method for weakly contaminated water
AWVP-02 2021-02	Determination of silicate by small-scale sealed tube method in water

1.4 Cations

DIN 38406-E 1 1983-05	Determination of iron
DIN EN ISO 12846 (E 12) 2012-08	Water quality – Determination of mercury – Method using atomic absorption spectrometry
DIN EN ISO 11885 (E 22) 2009-09	Water quality – Determination of selected elements by inductively coupled plasma optical emission spectrometry (ICP-OES)
DIN EN ISO 11732 (E 23) 2005-05	Water quality – Determination of ammonium nitrogen – Method by flow analysis (CFA and FIA) and spectrometric detection

1.5 Jointly determinable substance groups

DIN EN ISO 17993 (F 18) 2004-03	Water quality – Determination of 15 polycyclic aromatic hydrocarbons (PAHs) in water by HPLC with fluorescence detection after liquid-liquid extraction
DIN 38407-F 43 2014-10	Determination of selected easily volatile organic compounds in water – Method using gas chromatography and mass spectrometry by static headspace technique (HS-GC-MS)

1.6 Gaseous components

DIN EN ISO 7393-2 (G 4-2) 2000-04	Water quality – Determination of free chlorine and total chlorine – Part 2: Colorimetric method using N,N-diethyl-1,4-phenylenediamine, for routine control purposes
DIN ISO 17289 (G 25) 2014-12	Water quality – Determination of dissolved oxygen – Optical sensor method
LCK 310 2021-05	Determination of chlorine dioxide by small-scale sealed tube method in water in the range from 0.05 mg/L to 2 mg/L

1.7 Summary indices of actions and substances

DIN 38409-H 1 1987-01	Determination of total dry residue, filtrate dry residue and residue on ignition
DIN EN 1484 (H 3) 2019-04	Water analysis – Guidelines for the determination of total organic carbon (TOC) and dissolved organic carbon (DOC)
DIN EN ISO 8467 (H 5) 1995-05	Water quality – Determination of permanganate index
DIN 38409-H 6 1986-01	Water hardness
DIN 38409-H 7 2005-12	Determination of acid and base-neutralising capacities
DIN 38409-H 8 1984-09	Determination of extractable organically bonded halogens (EOX)
DIN 38409-H 9 1980-07	Determination of the settleable matter by volume in water and waste water
DIN EN ISO 9562 (H 14) 2005-02	Determination of adsorbable organically bound halogens (AOX)
DIN 38409-H 16 1984-06	Determination of the phenol index
DIN 38409-H 22 2001-02	Determination of dissolved adsorbable and organically bound halogens in salt loaded water after solid-phase enrichment (SPE-AOX)

DEV H 25 22. Delivery 1989	Determination of organically bound halogens amenable to purging (POX)
DIN EN ISO 14402 (H 37) 1999-12	Water quality – Determination of phenol index by flow analysis (FIA and CFA)
DIN 38409-H 44 1992-05	Determination of the chemical oxygen demand (COD), ranging from 5 to 50 mg/l
DIN EN ISO 9377-2 (H 53) 2001-07	Water quality – Determination of hydrocarbon oil index – Part 2: Method using solvent extraction and gas chromatography
DIN ISO 11349 (H 56) 2015-12	Water quality – Determination of low-volatility lipophilic substances – Gravimetric method
DIN 38413-P 1 1982-03	Determination of hydrazine
DIN EN ISO 5815-1 2020-11	Water quality – Determination of biochemical oxygen demand after n days (BOD_n) – Part 1: Dilution and seeding method with allylthiourea acid addition
AWVP-04 2021-05	Determination of formaldehyde in water and aqueous media (HPLC technique)

2 Tests in accordance with the German Drinking Water Ordinance – TrinkwV –

Sampling

Method	Title
DIN EN ISO 5667-1 (A 4) 2007-04	Water quality – Sampling – Part 1: Guidance on the design of sampling programmes and sampling techniques
DIN ISO 5667-5 (A 14) 2011-02	Water quality – Sampling – Part 5: Guidance on sampling of drinking water from treatment works and piped distribution systems
DIN EN ISO 5667-3 (A 21) 2013-03	Water quality – Sampling – Part 1: Preservation and handling of water samples
DIN EN ISO 19458 (K 19) 2006-12	Water quality – Sampling for microbiological analysis
Method	**Title**
Recommendation of the Federal Environment Agency 18 December 2018	Assessment of the quality of drinking water with respect to the parameters lead, copper and nickel

ANNEX 1: MICROBIOLOGICAL PARAMETERS

PART I: General requirements for drinking water

Not used

PART II: Requirements for drinking water intended for transfer in sealed containers

Not used

ANNEX 2: CHEMICAL PARAMETERS

PART I: Chemical parameters whose concentration does not usually increase in the distribution network, including the drinking water installation

No.	Parameter	Method
1	Acrylamide	Not used
2	Benzene	DIN 38407-F 43 2014-10
3	Boron	DIN EN ISO 11885 (E 22) 2009-09
4	Bromate	Not used
5	Chromium	DIN EN ISO 11885 (E 22) 2009-09
6	Cyanide	DIN EN ISO 14403 (D 6) 2002-07
7	1,2-dichloroethane	DIN EN ISO 10301 (F 4) 1997-08
8	Fluoride	DIN 38405-D 4 1985-07
9	Nitrate	DIN EN ISO 10304-1 (D 20)2009-07
10	Plant protection product active ingredients and biocidal product active ingredients	Not used
11	Plant protection product active ingredients and biocidal product active ingredients total	Not used
12	Mercury	DIN EN ISO 12846 (E 12) 2012-08
13	Selenium	DIN EN ISO 11885 (E 22) 2009-09
14	Tetrachloroethene and trichloroethylene	DIN EN ISO 10301 (F 4) 1997-08
15	Uranium	Not used

PART II: Chemical parameters whose concentration may increase in the distribution network, including the drinking water installation

No.	Parameter	Method
1	Antimony	DIN EN ISO 11885 (E 22) 2009-09
2	Arsenic	DIN EN ISO 11885 (E 22) 2009-09
No.	**Parameter**	**Method**
3	Benzo[a]pyrene	Not used
4	Lead	DIN EN ISO 11885 (E 22) 2009-09
5	Cadmium	DIN EN ISO 11885 (E 22) 2009-09
6	Epichlorohydrin	Not used

7	Copper	DIN EN ISO 11885 (E 22) 2009-09
8	Nickel	DIN EN ISO 11885 (E 22) 2009-09
9	Nitrite	DIN EN 26777 (D 10) 1993-04
10	Polycyclic aromatic hydrocarbons	Not used
11	Trihalomethanes	DIN EN ISO 10301 (F 4) 1997-08
12	Vinyl chloride	DIN EN ISO 10301 (F 4) 1997-08

ANNEX 3: INDICATOR PARAMETERS

Part I: General indicator parameters

No.	Parameter	Method
1	Aluminium	DIN EN ISO 11885 (E 22) 2009-09
2	Ammonium	DIN EN ISO 11732 (E 23) 2005-05
3	Chloride	DIN EN ISO 10304-1 (D 20) 2009-07
4	Clostridium perfringens (including spores)	Not used
5	Coliform bacteria	Not used
6	Iron	DIN EN ISO 11885 (E 22) 2009-09
7	Colouring (spectral absorption coefficient Hg 436 nm)	DIN EN ISO 7887 (C 1-2) 1994-12
8	Odour	DIN EN 1622 (B 3) 2006-10
9	Taste	DEV B1/2 Part a 1971
10	Colony count at 22 °C	Not used
11	Colony count at 36 °C	Not used
12	Electrical conductivity	DIN EN 27888 (C 8) 1993-11
13	Manganese	DIN EN ISO 11885 (E 22) 2009-09
14	Sodium	DIN EN ISO 11885 (E 22) 2009-09
15	Organically bound carbon (TOC)	DIN EN 1484 (H 3) 2019-04
16	Oxidisability	DIN EN ISO 8467 (H 5) 1995-05
17	Sulphate	DIN EN ISO 10304-1 (D 20) 2009-07
18	Turbidity	DIN EN ISO 7027 (C 2) 2000-04
19	Hydrogen ion concentration	DIN EN ISO 10523 (C 5) 2012-04
20	Calcite dissolving capacity	DIN 38404-C 10 2012-12

Part II: Specific requirements for drinking water in systems in the drinking water installation

Not used

ANNEX 3a: Requirements for drinking water with regard to radioactive substances

Not used

Parameters not included in Annexes 1 to 3 of the German Drinking Water Ordinance

Additional periodic testing

Parameter	Method
Calcium	DIN EN ISO 11885 (E 22) 2009-09
Potassium	DIN EN ISO 11885 (E 22) 2009-09
Magnesium	DIN EN ISO 11885 (E 22) 2009-09
Acid capacity	DIN 38409-H7 2004-03
Phosphate	DIN EN ISO 6878 2004-09

The accreditation does not replace the recognition or approval procedure of the competent authority pursuant to Section 15 (4) TrinkwV.

3 Analysis of soils and soil eluates

3.1 Sampling

DIN EN 932-1 1996-11	Test for general properties of aggregates – Part 1: Methods of sampling
DIN 4030-2 1991-06	Assessment of water, soil and gases for their aggressiveness to concrete; collection and examination of water and soil samples

3.2 Sampling and sample preparation

DIN 38414-S 4 1984-10	Determination of leachability with water
DIN ISO 11464 2006-12	Soil quality – Pretreatment of samples for physico-chemical analysis
DIN ISO 11466 1997-06	Soil quality – Extraction of trace elements soluble in aqua regia (Modification: *Also DigiPREP digestion*)
DIN ISO 14507 2004-07	Soil quality – Pretreatment of samples for determination of organic contaminants in soils
DIN 13657 2003-01	Characterisation of waste – Digestion for subsequent determination of aqua regia soluble portion of elements in waste (Modification: *Also DigiPREP digestion*)
DIN 19747 2009-07	Investigation of solids – Pretreatment, preparation and processing of samples for chemical, biological and physical investigations

VDLUFA I, D 2.1 1997	Determination of soil texture of fine soil with the feel test

3.3 Physical and physico-chemical methods

DIN ISO 11265 1997-06	Soil quality – Determination of specific electrical conductivity

3.4 Inorganic parameters

DIN 38405-D 24 1987-05	Photometric determination of chromium(VI) using 1,5-diphenylcarbonohydrazide
ISO 11262 2012-04	Soil quality – Determination of cyanide
ISO 13878 1998-03	Soil quality – Determination of total nitrogen content after dry combustion (elemental analysis)
DIN ISO 16772 2005-06	Soil quality – Determination of mercury in aqua regia soil extracts with cold-vapour atomic spectrometry or cold-vapour atomic fluorescence spectrometry
DIN ISO 22036 2009-06	Soil quality – Determination of trace elements in extracts of soil by inductively coupled plasma atomic emission spectrometry (ICP-AES)

3.5 Jointly determinable parameters

DIN 38409-H 16-3 1984-06	Determination of the phenol index (Modification for soils: *Elutriation of samples with purified water, pH = 0.5; steam distillation, UV/VIS photometry*)
DEV H 25 22. Delivery 1989	Determination of organically bound halogens amenable to purging (POX)
DIN EN ISO 14402 (H 37) 1999-12	Water quality – Determination of phenol index by flow analysis (FIA and CFA) (Modification for soils: *Extraction with $CuSO_4$ + H_3PO_4, preserved with H_2SO_4 1:4*)

DIN 38414-S 17 2012-02	Determination of the organically bound halogens amenable to extraction (EOX)
DIN 38414-S 18 1989-11	Determination of adsorbed organically bound halogens (AOX)
DIN 38414-S 20 1996-01	Sludge and sediments – Determination of 6 polychlorinated biphenyls
DIN 38414-S 23 2002-02	Sludge and sediments – Determination of 15 polycyclic aromatic hydrocarbons (PAH) by high performance liquid chromatography (HPLC) and fluorescence detection
DIN ISO 10382 2003-05	Soil quality – Determination of polychlorinated biphenyls
DIN ISO 10694 1996-08	Soil quality – Determination of organic carbon and total carbon after dry combustion (elemental analysis)
DIN ISO 13877 2000-10	Soil quality – Determination of polynuclear aromatic hydrocarbons – Method using high-performance liquid chromatography
DIN ISO 14154 2005-12	Soil quality – Determination of selected chlorophenols in soils – Gas chromatographic method (Here: *Pentachlorphenol*)
DIN ISO 18287 2006-05	Soil quality – Determination of polycyclic aromatic hydrocarbons – Gas chromatographic method with mass spectrometric detection (GC-MS)
DIN ISO 22155 2016-07	Soil quality – Gas chromatographic determination of volatile aromatic and halogenated hydrocarbons and selected ethers – Static headspace method
DIN EN ISO 16703 2011-09	Soil quality – Determination of content of hydrocarbon in the range C_{10} bis C_{40} by gas chromatography
DIN EN 13137 2001-12	Characterisation of waste – Determination of total organic carbon (TOC) in waste, sludges and sediments
DIN EN 15308 2016-12	Characterisation of waste – Determination of selected polychlorinated biphenyls (PCB) in solid waste by using capillary gas chromatography with electron capture or mass spectrometric detection (valid also for polychlorinated terphenyls – PCT)

DIN EN 15527 2008-09	Determination of polycyclic aromatic hydrocarbons (PAHs) in waste using gas chromatography mass spectrometry (GC/MS)
DIN EN 15934 2012-11	Sludge, treated biowaste, soil and waste – Calculation of dry matter fraction after determination of dry residue or water content
DIN EN 15936 2012-11	Sludge, treated biowaste, soil and waste – Determination of total organic carbon (TOC) by dry combustion
HLUG Handbuch Altlasten, Volume 3, Part 5 2001	Evaluation of mineral oil gas chromatograms
HLUG Handbuch Altlasten, Volume 7, Part 1 1998	Determination of PAHs in solids from brownfields
HLUG, Handbuch Altlasten, Volume 7, Part 4 1998-03	Determination of volatile halogenated and aromatic hydrocarbons (VOC, BTX); gas chromatographic method, overlay with methanol, GC/MS detection
LAGA Guideline KW/04 2004-11	Determination of the content of hydrocarbons in waste (Modification for soils: *Extraction in ultrasonic bath*)
LUA-NRW Information Sheet No. 1 1994-04	Determination of polycyclic aromatic hydrocarbons (PAH) in soil samples

4 Analysis of waste and its eluates

4.1 Sampling

DIN EN ISO 5667-13 (S 1) 1998-02	Sampling – Guidance on sampling of sludge from waste water treatment and water purification plants
DIN EN 12176 (S 5) 1998-06	Characterisation of sludge – Determination of the pH value
AbfKlärV, Annex 1, 1.1-1.3, 2.1 1992-04	Sampling – Sample preparation and analysis of sewage sludge and soil
LAGA PN 98 2019-05	Basic rules for the taking of samples from solid and semi-solid waste and deposited materials

4.2 Sampling and sample preparation

DIN 38414-S 4 1984-10	Determination of leachability with water
DIN ISO 11464 2006-12	Soil quality – Pretreatment of samples for physico-chemical analysis
DIN ISO 11466 1997-06	Soil quality – Extraction of trace elements soluble in aqua regia *(Application to waste*)
DIN ISO 14507 2004-07	Soil quality – Pretreatment of samples for determination of organic contaminants in soils
DIN EN 1744-1 2013-03	Tests for chemical properties of aggregates – Part 1: Chemical analysis – Determination of water-soluble chlorides by potentiometry (alternative method)
DIN EN 1744-1 2013-03	Tests for chemical properties of aggregates – Part 1: Chemical analysis – Determination of water-soluble sulphates
DIN EN 1744-1 2013-03	Tests for chemical properties of aggregates – Part 1: Chemical analysis – Determination of total sulphur
DIN EN 1744-1 2013-03	Tests for chemical properties of aggregates – Part 1: Chemical analysis – Determination of acid-soluble sulphates
DIN EN 1744-3 2002-11	Tests for chemical properties of aggregates – Part 3: Preparation of eluates by leaching of aggregates
DIN EN 1744-5 2006-12	Tests for chemical properties of aggregates – Part 5: Determination of acid soluble chlorides
DIN EN 12457-1 2003-01	Characterisation of waste – Leaching – Compliance test for leaching of granular waste materials and sludges – Part 1: One stage batch test at a liquid to solid ratio of 2 l/kg with particle size below 4 mm (without or with size reduction)
DIN EN 12457-2 2003-01	Characterisation of waste – Leaching – Compliance test for leaching of granular waste materials and sludges – Part 2: One stage batch test at a liquid to solid ratio of 10 l/kg with particle size below 4 mm (without or with size reduction)

DIN EN 15002 2006-05	Characterisation of waste – Preparation of test portions from the laboratory sample
DIN EN 15934 2012-11	Sludge, treated biowaste, soil and waste – Calculation of dry matter fraction after determination of dry residue or water content
DIN EN 16174 2012-12	Sludge, treated biowaste and soil – Digestion of aqua regia soluble fractions of elements (Modification: *Also DigiPREP digestion*)
DIN 19527 2010-05	Leaching of solid materials – Batch test for the examination of the leaching behaviour of organic substances at a liquid to solid ratio of 2l/kg
DIN 19529 2009-01	Leaching of solid materials – Batch test for the examination of the leaching behaviour of inorganic substances at a liquid to solid ratio of 2l/kg
DIN 19734 1999-01	Soil quality – Determination of chromium(VI) in phosphate extract
DIN 19747 2009-07	Investigation of solids – Pretreatment, preparation and processing of samples for chemical, biological and physical investigations
AltholzV, Annex IV No. 1.2 with DIN 51701-03 1998-08	Preparation of the laboratory sample, sample division
TP Min-StB Part 7.1.2 1999	Technical test specification for mineral materials in road construction – Trough method

4.3 Physical and physico-chemical methods

DIN 38409-H 1-2 2001-02	Residue on evaporation and filterable matter (Modification for waste: *Determination after eluate preparation at 105 °C with subsequent weighing until mass constancy*)
DIN EN 1484 (H3) 2019-04	Guidelines for the determination of total organic carbon (TOC) and dissolved organic carbon (DOC)
DIN EN 12176 (S 5) 1998-06	Characterisation of sludge – Determination of the pH value

DIN EN 12879 (S 3a) 2001-02	Characterisation of sludges – Determination of loss on ignition of dry mass
DIN EN 12880 (S 2a) 2001-02	Characterisation of sludges – Determination of dry residue and water content
DIN ISO 11265 1997-06	Soil quality – Determination of specific electrical conductivity
DIN ISO 11465 1996-12	Soil quality – Determination of dry matter and water content on a mass basis – Gravimetric method
DIN EN 13137 2001-12	Characterisation of waste – Determination of total organic carbon (TOC) in waste, sludges and sediments
DIN EN 14346 2007-03	Characterisation of waste – Calculation of dry matter by determination of dry residue or water content
DIN EN 15169 2007-05	Characterisation of waste – Determination of loss on ignition in waste
DIN EN 15170 2009-05	Characterisation of sludges – Determination of calorific value
DIN EN 15216 2008-01	Characterisation of waste – Determination of total dissolved solids (TDS) in water and eluates
DIN 19539 2016-12	Investigation of solids – Temperature-dependent differentiation of total carbon (TOC_{400}, ROC, TIC_{900})

4.4 Determination of inorganic parameters

DIN EN ISO 10304-1 (D 20) 2009-07	Water quality – Determination of dissolved anions by liquid chromatography of ions – Part 1: Determination of bromide, chloride, fluoride, nitrate, nitrite, phosphate and sulphate (Modification for waste: *Elution with water*)
DIN 38405-D 24 1987-05	Photometric determination of chromium(VI) using 1,5-diphenylcarbonohydrazide
DIN EN 1483 (E 12) 2007-07	Water quality – Determination of mercury (Modification for waste: *Determination in aqua regia extraction solution, compensation of matrix failures*)

ISO 11262 2012-04	Soil quality – Determination of total cyanide
DIN ISO 17380 2006-05	Soil quality – Determination of total cyanide and easily liberatable cyanide – Continuous flow analysis method
DIN EN 14582 2007-06	Characterisation of waste – Halogen and sulphur content – Oxygen combustion in closed systems and determination methods

4.5 Determination of organic parameters

DIN 38409-H 16-3 1984-06	Determination of the phenol index (Modification for soils: *Elutriation of samples with purified water, pH = 0.5; steam distillation, UV/VIS photometry*)
DEV H 25 22. Delivery 1989	Determination of organically bound halogens amenable to purging (POX)
DIN EN ISO 14402 (H 37) 1999-12	Water quality – Determination of phenol index by flow analysis (FIA and CFA) (Modification for soils: *Extraction with $CuSO_4$ + H_3PO_4, preserved with H_2SO_4 1:4*)
DIN 38414-S 17 1989-11	Determination of the organically bound halogens amenable to purging and extraction
DIN 38414-S 18 1989-11	Determination of adsorbed organically bound halogens (AOX)
DIN EN ISO 16703 2011-09	Soil quality – Determination of content of hydrocarbon in the range C_{10} to C_{40} by gas chromatography
DIN ISO 13877 2000-01	Soil quality – Determination of polynuclear aromatic hydrocarbons – Method using high-performance liquid chromatography
AltholzV A IV No. 1.4.4. 2002-08	Determination of pentachlorophenol (PCP) *(Here also valid for gamma-HCH and hexachlorobenzene*)
HLUG Handbuch Altlasten, Volume 3, Part 5 2001	Evaluation of mineral oil gas chromatograms

HLUG Handbuch Altlasten, Volume 7, Part 3 2001	Determination of mineral oil hydrocarbons by capillary gas chromatography in solids from brownfields
HLUG Handbuch Altlasten, Volume 7, Part 4 2001	Determination of volatile and aromatic hydrocarbons (VOC, BTX); gas chromatographic method, overlay with methanol, GC/MS detection
LUA-NRW Information Sheet No. 1 1994-04	Determination of polycyclic aromatic hydrocarbons (PAH) in soil samples

5 Analysis of liquid and solid fuels

5.1 Liquid fuels

5.1.1 Sample pretreatment

DIN EN 13346 2001-04	Characterisation of sludges – Determination of trace elements and phosphorus – Aqua regia extraction methods (Modification: *Aqua regia extraction is from the original sample*)

5.1.2 Physical and physico-chemical methods

DIN EN ISO 2592 2002-09	Petroleum products – Determination of flash and fire points – Cleveland open cup method
DIN EN ISO 2719 2003-09	Petroleum products and lubricants – Determination of flash point – Pensky-Martens closed cup method
DIN EN 12766-1 2001-11	Petroleum products and used oils – Determination of PCBs and related products – Part 1: Separation and determination of selected PCB congeners by gas chromatography (GC) using an electron capture detector (ECD)
DIN EN 12766-2 2001-12	Petroleum products and used oils – Determination of PCBs and related products – Part 2: Calculation of polychlorinated biphenyl (PCB)
DIN EN 12766-3 and Corrigendum 2007-06	Petroleum products and used oils – Determination of PCBs and related products – Part 3: Determination and quantification of polychlorinated terphenyls (PCT) content by gas chromatography (GC) using an electron capture detector (ECD)

DIN 51900-1 2000-04	Testing of solid and liquid fuels – Determination of gross calorific value by the bomb calorimeter and calculation of net calorific value – Principles, apparatus, methods
DIN 51900-2 2003-05	Testing of solid and liquid fuels – Determination of the gross calorific value by the bomb calorimeter and calculation of the net calorific value – Method using isoperibol calorimeter

5.1.3 Inorganic parameters

DIN EN ISO 8754 2003-12	Petroleum products – Determination of sulphur content – Energy dispersive X-ray fluorescence method
DIN EN 14582 2016-12	Characterisation of waste – Halogen and sulphur content – Oxygen combustion in closed systems and determination methods
DIN 51577-4 1994-02	Testing of mineral oil hydrocarbons and similar products – Determination of chlorine and bromine content – Analysis by energy dispersive X-ray spectrometry with low cost instruments (Here: *Determination of chlorine*)

5.1.4 Jointly determinable parameters

DIN EN ISO 12937 2002-03	Petroleum products – Determination of water content – Coulometric Karl Fischer titration method
DIN 51777-1 1983-03	Testing of mineral oil hydrocarbons and solvents – Determination of water content according to Karl Fischer; direct method

5.2 Analysis of solid fuels, recovered fuels and biofuels

5.2.1 Solid fuels

DIN 51718 2002-06	Testing of solid fuels – Determination of the water content and the moisture of analysis sample
DIN 51719 1997-07	Testing of solid fuels – Determination of ash content
DIN 51720 2001-03	Testing of solid fuels – Determination of volatile matter content

DIN 51723 2002-06	Testing of solid fuels – Determination of fluorine content
DIN 51724-3 2012-07	Testing of solid fuels – Determination of sulphur content Part 3: Instrumental methods
DIN 51727 2011-11	Testing of solid fuels – Determination of chlorine content
DIN 51732 2014-07	Testing of solid fuels – Determination of total carbon, hydrogen and nitrogen – Instrumental methods
DIN 51900-1 2000-04	Testing of solid and liquid fuels – Determination of gross calorific value by the bomb calorimeter and calculation of net calorific value – Principles, apparatus, methods
DIN 51900-2 2003-05	Testing of solid and liquid fuels – Determination of the gross calorific value by the bomb calorimeter and calculation of the net calorific value – Method using isoperibol calorimeter

5.2.2 Recovered fuels

DIN EN 15400 2011-05	Solid recovered fuels – Determination of calorific value
DIN EN 15403 2011-05	Solid recovered fuels – Methods for the determination of ash content
DIN EN 15407 2011-05	Solid recovered fuels – Methods for the determination of carbon (C), hydrogen (H) and nitrogen (N) content
DIN EN 15408 2011-05	Solid recovered fuels – Methods for determination of sulphur (S), chlorine (Cl), fluorine (F) and bromine (Br) content
DIN EN 15413 2011-11	Solid recovered fuels – Methods for the preparation of the test sample from the laboratory sample
DIN EN 15414-3 2011-05	Solid recovered fuels – Determination of moisture content using the oven dry method – Part 3: Moisture in general analysis sample
DIN EN 15440 2011-05	Solid recovered fuels – Methods for the determination of biomass content

DIN EN 15443 2011-05	Solid recovered fuels – Methods for the preparation of the laboratory sample
DIN CEN/TS 15412 2010-09	Solid recovered fuels – Methods for determination of metallic aluminium
DIN CEN/TS 15414-2 2010-10	Solid recovered fuels – Determination of moisture content using the oven dry method – Part 2: Determination of total moisture by a simplified method
DIN 19539 2016-12	Temperature-dependent differentiation of total carbon (TOC_{400}, ROC, TIC_{900})

5.2.3 Biofuels

DIN EN ISO 14780 2017-08	Solid biofuels – Sample preparation
DIN EN ISO 16948 2015-09	Solid biofuels – Determination of total content of carbon, hydrogen and nitrogen – Instrumental methods
DIN EN ISO 16993 2016-11	Solid biofuels – Conversion of analytical results from one basis to another
DIN EN ISO 16994 2016-12	Solid biofuels – Determination of total content of sulphur and chlorine
DIN EN ISO 17827-1 2016-10	Solid biofuels – Determination of particle size distribution for uncompressed fuels – Part 1: Oscillating screen method using sieve apertures of 3.15 mm and above
DIN EN ISO 17827-2 2016-10	Solid biofuels – Determination of particle size distribution for uncompressed fuels – Part 2: Vibrating screen method using sieves with aperture of 3.15 mm and below
DIN EN ISO 17828 2016-05	Solid biofuels – Determination of bulk density
DIN EN ISO 18122 2016-03	Solid biofuels – Determination of ash content
DIN EN ISO 18125 2017-08	Solid biofuels – Determination of calorific value

DIN EN ISO 18134-2 2017-05	Solid biofuels – Determination of moisture content – Oven dry method – Part 2: Total moisture – Simplified procedure
DIN EN ISO 18134-3 2015-12	Solid biofuels – Determination of moisture content – Oven dry method – Part 3: Moisture in general analysis sample

6 Selected analysis of grits for winter service

DIN EN 16811-1 Annex C.1 2016-10	Winter service equipment and products – De-icing agents – Part 1: Sodium chloride – Requirements and test methods Determination of sodium chloride (potentiometer method)
DIN EN 16811-1 Annex C.2 2016-10	Winter service equipment and products – De-icing agents – Part 1: Sodium chloride – Requirements and test methods Determination of aluminium, arsenic, cadmium, calcium, chromium, cobalt, copper, lead, magnesium, nickel, zinc by ICP-OES
DIN EN 16811-1 Annex C.3 2016-10	Winter service equipment and products – De-icing agents – Part 1: Sodium chloride – Requirements and test methods Determination of total mercury content (cold vapour atomic absorption spectrometry)
DIN EN 16811-1 Annex C.4 2016-10	Winter service equipment and products – De-icing agents – Part 1: Sodium chloride – Requirements and test methods Determination of anti-caking agent content
ISO 2480 1972-12	Sodium chloride for industrial use – Determination of sulphate content – Gravimetric method
ISO 2483 1973-01	Sodium chloride for industrial use – Determination of the loss of mass at 110°C
ISO 2591-1 1988-01	Part 1: Methods using test sieves of woven wire cloth and perforated metal plate
DIN 66165-2 1987-04	Particle size analysis; sieve analysis; procedure

7 List of test methods for the specialist module for WATER

Revised: LAWA of 18.10.2018

Section 1: Sampling and general parameters

Parameter	Method	Was	Sur	Raw
Sampling of waste water	**DIN 38402-A 11: 2009-02**	☒		
Sampling from running waters	DIN EN ISO 5667-6: 2016-12 (A 15)		☒	
Sampling from aquifers	DIN 38402-A 13: 1985-12			☒
Sampling from barrages and lakes	DIN 38402-A 12: 1985-06		☒	
Homogenisation of samples	**DIN 38402-A 30: 1998-07**	☒	☒	
Temperature	DIN 38404-C 4: 1976-12	☒	☒	☒
pH value	**DIN EN ISO 10523: 2012-04 (C 5)**	☒	☒	☒
Conductivity (25 °C)	DIN EN 27888: 1993-11 (C 8)	☒	☒	☒
Odour	DIN EN 1622: 2006-10 (B 3) Annex C	☒	☒	☒
Colouring	DIN EN ISO 7887: 2012-04 (C 1), Method A	☒	☒	☒
Turbidity	DIN EN ISO 7027: 2000-04 (C 2)	☒	☒	☒
Oxygen	DIN EN ISO 5814: 2013-03 (G 22)		☒	☒
	DIN ISO 17289: 2014-12 (G 25)		☒	☒
	DIN EN 25813: 1993-01 (G 21)		☐	☐
Redox potential	**DIN 38404-C 6: 1984-05**	☐		☒

Section 2: Photometry, ion chromatography, titrimetry

Parameter	Method	Was	Sur	Raw
Absorption at 254 nm (SAC 254)	DIN 38404-C 3: 2005-07		☒	☒
Absorption at 436 nm (SAC 436)	DIN EN ISO 7887: 2012-04 (C 1), Method B	☒	☒	☒
Ammonium nitrogen	**DIN EN ISO 11732: 2005-05 (E 23)**	☒	☒	☒
	DIN 38406-E 5: 1983-10	☐	☐	☐
	DIN EN ISO 14911: 1999-12 (E 34)		☐	☐
	DIN ISO 15923-1: 2014-07 (D 49)	☐	☐	☐

Parameter	Method	Was	Sur	Raw
Nitrite nitrogen	**DIN EN 26777: 1993-04 (D 10)**	☒	☒	☒
	DIN EN ISO 10304-1: 2009-07 (D 20)	☐	☐	☐
	DIN EN ISO 13395: 1996-12 (D 28)	☐	☐	☐
	DIN ISO 15923-1: 2014-07 (D 49)	☐	☐	☐
Nitrate nitrogen	**DIN EN ISO 10304-1: 2009-07 (D 20)**	☒	☒	☒
	DIN EN ISO 13395: 1996-12 (D 28)	☐	☐	☐
	DIN 38405-D 9: 2011-09	☐	☐	☐
	DIN 38405-D 29: 1994-11		☐	☐
	DIN ISO 15923-1: 2014-07 (D 49)	☐	☐	☐
Phosphorus, total *(see also section 3)*	**DIN EN ISO 6878: 2004-09 (D 11)**	☒	☒	☒
	DIN EN ISO 15681-1: 2005-05 (D 45)	☐	☐	☐
	DIN EN ISO 15681-2: 2005-05 (D 46)	☐	☐	☐
Orthophosphate	DIN EN ISO 10304-1: 2009-07 (D 20)		☐	☐
	DIN EN ISO 6878: 2004-09 (D 11)		☒	☒
	DIN EN ISO 15681-1: 2004-07 (D 45)		☐	☐
	DIN EN ISO 15681-2: 2005-05 (D 46)		☐	☐
	DIN ISO 15923-1: 2014-07 (D 49)		☐	☐
Fluoride (dissolved)	**DIN 38405-D 4-1, 1985-07**	☒	☒	☒
	DIN EN ISO 10304-1: 2009-07 (D 20)	☐	☐	☐
Chloride	**DIN EN ISO 10304-1: 2009-07 (D 20)**	☒	☒	☒
	DIN EN ISO 15682: 2002-01 (D 31)	☐	☐	☐
	DIN ISO 15923-1: 2014-07 (D 49)	☐	☐	☐
	DIN EN ISO 10304-4: 1999-07 (D 25)			☐
	DIN 38405-D 1-1 und D 1-2: 1985-12	☐	☐	☐
	DIN 38405-D 1-3 und D 1-4: 1985-12		☐	☐
Sulphate	**DIN EN ISO 10304-1: 2009-07 (D 20)**	☒	☒	☒
	DIN 38405-D 5-1: 1985-01		☐	☐
	DIN 38405 D 5-2:1985-01	☐	☐	☐
	DIN ISO 15923-1: 2014-07 (D 49)	☐	☐	☐

Parameter	Method	Was	Sur	Raw
Cyanide (readily liberated)	**DIN 38405-D 13-2: 1981-02**	☒	☒	☒
	DIN EN ISO 14403-1: 2012-10 (D 2)	☐	☐	☐
	DIN EN ISO 14403-2: 2012-10 (D 3)	☐	☐	☐
	DIN 38405-D 7: 2002-04		☐	☐
Cyanide (total)	**DIN 38405-D 13-1: 1981-02**	☒	☒	☒
	DIN EN ISO 14403-1: 2012-10 (D 2)	☐	☐	☐
	DIN EN ISO 14403-2: 2012-10 (D 3)	☐	☐	☐
	DIN 38405-D 7: 2002-04		☐	☐
Chromium(VI)	**DIN 38405-D 24: 1987-05**	☒	☒	☒
	DIN EN ISO 10304-3: 1997-11 (D 22), Section 6 (dissolved chromate)	☐	☐	☐
	DIN EN ISO 23913: 2009-09 (D 41)	☐	☐	☐
	DIN EN ISO 18412: 2007-02 (D 40)			☐
Sulphide (readily liberated)	**DIN 38405-D 27: 1992-07**	☒	☒	☒

Section 3: Elemental analysis

Parameter	Method	Was	Sur	Raw
Aluminium	**DIN EN ISO 11885: 2009-09 (E 22)**	☒	☒	☒
	DIN EN ISO 12020: 2000-05 (E 25)	☐	☐	☐
	DIN EN ISO 17294-2: 2017-01 (E 29)	☐	☐	☐
	DIN EN ISO 15586: 2004-02 (E 4)		☐	☐
Arsenic	**DIN EN ISO 11969: 1996-11 (D 18)**	☐	☐	☐
	DIN EN ISO 11885: 2009-09 (E 22)	☒		
	DIN EN ISO 17294-2: 2017-01 (E 29)	☐	☐	☐
	DIN EN ISO 15586: 2004-02 (E 4)	☐	☐	☐
	DIN 38405-D 35: 2004-09	☐	☐	☐
Lead	**DIN EN ISO 11885: 2009-09 (E 22)**	☒		
	DIN 38406-E 6: 1998-07	☐	☐	☐
	DIN EN ISO 17294-2: 2017-01 (E 29)	☐	☐	☐
	DIN EN ISO 15586: 2004-02 (E 4)	☐	☐	☐

Parameter	Method	Was	Sur	Raw
Cadmium	**DIN EN ISO 11885: 2009-09 (E 22)**	☒		
	DIN EN ISO 5961: 1995-05 (E 19)	☐	☐	☐
	DIN EN ISO 17294-2: 2017-01 (E 29)	☐	☐	☐
	DIN EN ISO 15586: 2004-02(E 4)	☐	☐	☐
Calcium	DIN EN ISO 11885: 2009-09 (E 22)		☒	☒
	DIN 38406-E 3: 2002-03		☐	☐
	DIN EN ISO 7980: 2000-07 (E 3a)		☐	☐
	DIN EN ISO 17294-2: 2017-01 (E 29)		☐	☐
	DIN EN ISO 14911: 1999-12 (E 34)		☐	☐
Chromium	**DIN EN ISO 11885: 2009-09 (E 22)**	☒	☒	☒
	DIN EN 1233: 1996-08 (E 10)	☐	☐	☐
	DIN EN ISO 17294-2: 2017-01 (E 29)	☐	☐	☐
	DIN EN ISO 15586: 2004-02 (E 4)	☐	☐	☐
Iron	**DIN EN ISO 11885: 2009-09 (E 22)**	☒	☒	☒
	DIN 38406-E 32: 2000-05	☐	☐	☐
	DIN EN ISO 15586: 2004-02 (E 4)	☐	☐	☐
	DIN EN ISO 17294-2: 2017-01 (E 29)	☐	☐	☐
Potassium	DIN 38406-E 13: 1992-07		☐	☐
	DIN EN ISO 11885: 2009-09 (E 22)		☒	☒
	DIN EN ISO 17294-2: 2017-01 (E 29)		☐	☐
	DIN EN ISO 14911: 1999-12 (E 34)		☐	☐
Copper	**DIN EN ISO 11885: 2009-09 (E 22)**	☒	☒	☒
	DIN 38406-E 7: 1991-09	☐	☐	☐
	DIN EN ISO 17294-2: 2017-01 (E 29)	☐	☐	☐
	DIN EN ISO 15586: 2004-02 (E 4)	☐	☐	☐
	DIN 38406-E 7: 1991-09	☐	☐	☐
	DIN EN ISO 17294-2: 2017-01 (E 29)	☐	☐	☐
	DIN EN ISO 15586: 2004-02 (E 4)	☐	☐	☐

Manganese	DIN EN ISO 11885: 2009-09 (E 22)			☒
	DIN EN ISO 17294-2: 2017-01 (E 29)			☐
	DIN 38406-E 33: 2000-06			☐
	DIN EN ISO 15586: 2004-02 (E 4)			☐
	DIN EN ISO 14911: 1999-12 (E 34)			☐
Sodium	DIN 38406-E 14: 1992-07		☐	☐
	DIN EN ISO 11885: 2009-09 (E 22)		☒	☒
	DIN EN ISO 17294-2: 2017-01 (E 29)		☐	☐
	DIN EN ISO 14911: 1999-12 (E 34)		☐	☐
Nickel	**DIN EN ISO 11885: 2009-09 (E 22)**	☒	☒	☒
	DIN 38406-E 11: 1991-09	☐	☐	☐
	DIN EN ISO 17294-2: 2017-01 (E 29)	☐	☐	☐
	DIN EN ISO 15586: 2004-02 (E 4)	☐	☐	☐
Mercury	**DIN EN ISO17852: 2008-04 (E 35)**	☐	☐	☐
	DIN EN ISO 12846: 2012-08 (E 12)	☒	☒	☒
Zinc	DIN EN ISO 11885: 2009-09 (E 22)	☒	☒	☒
	DIN 38406-E 8: 2004-10	☐	☐	☐
	DIN EN ISO 17294-2: 2017-01 (E 29)	☐	☐	☐
	DIN EN ISO 15586: 2004-02 (E 4)	☐	☐	☐
Boron	DIN EN ISO 11885: 2009-09 (E 22)	☒	☒	☒
	DIN EN ISO 17294-2: 2017-01 (E 29)	☐	☐	☐
Magnesium	DIN EN ISO 11885: 2009-09 (E 22)		☒	☒
	DIN 38406-E 3: 2002-03		☐	☐
	DIN EN ISO 7980: 2000-07 (E 3a)		☐	☐
	DIN EN ISO 17294-2: 2017-01 (E 29)		☐	☐
	DIN EN ISO 14911: 1999-12 (E 34)		☐	☐
Phosphorus, total *(see also section 2)*	**DIN EN ISO 11885: 2009-09 (E 22)**	☐	☐	☐
	DIN EN ISO 17294-2: 2017-01 (E 29)	☐	☐	☐
	DIN EN ISO 17294-2: 2017-01 (E 29)	☐	☐	☐

Section 4/5: Group and sum parameters

Parameter	Method	Was	Sur	Raw
Biological oxygen demand (BOD_5)	**DIN EN 1899-1: 1998-05 (H 51)**	☒		
	DIN EN 1899-2: 1998-05 (H 52)		☐	
Chemical oxygen demand (COD)	**DIN 38409-H 41: 1980-12**	☒		
	DIN 38409-H 44: 1992-05		☒	
	DIN ISO 15705: 2003-01 (H 45)		☒	
Phenol index	**DIN 38409-H 16-2: 1984-06**	☐	☐	☐
	DIN 38409-H 16-1: 1984-06		☐	☐
	DIN EN ISO 14402: 1999-12 (H 37) Verfahren nach Abschn. 4	☒	☒	☒
Filterable solids	**DIN EN 872: 2005-04 (H 33)**	☒	☒	
	DIN 38409-H 2-3: 1987-03		☒	
Acid and base capacity	DIN 38409-H 7: 2005-12		☒	☒
Total organic carbon (TOC)	**DIN EN 1484: 1997-08 (H 3)**	☒	☒	☒
Dissolved organic carbon (DOC)	DIN EN 1484: 1997-08 (H 3)		☒	☒
Total bound nitrogen (TN_b)	DIN EN 12260: 2003-12 (H 34)	☐	☐	☐
	DIN EN ISO 11905-1: 1998-08 (H 36)	☐	☐	☐
Adsorbable organic halogens (AOX)	DIN EN ISO 9562: 2005-02 (H 14)	☒	☒	☒

Section 6: Gas chromatographic methods

Parameter	Method	Was	Sur	Raw
Volatile halogenated hydrocarbons (VOC)	**DIN EN ISO 10301: 1997-08 (F 4)***	☒	☒	☒
	DIN 38407-F 43: 2014-10	☒	☒	☒
	DIN EN ISO 15680: 2004-04 (F 19)	☐	☐	☐
	DIN EN ISO 17943: 2016-11 (F 41)		☐	☐
Benzene and derivatives (BTEX)	**DIN 38407-F 9: 1991-05***	☒	☒	☒
	DIN 38407-F 43: 2014-10	☒	☒	☒
	DIN EN ISO 15680: 2004-04 (F 19)	☐	☐	☐
	DIN EN ISO 17943: 2016-11 (F 41)		☐	☐
Organochlorine insecticides (OCP)	DIN EN ISO 6468: 1997-02 (F 1)*		☐	☐

Parameter	Method	Was	Sur	Raw
	DIN 38407-F 37: 2013-11		☐	☐
	DIN EN 16693: 2015-12 (F 51)		☐	☐
Polychlorinated biphenyls (PCB)	DIN EN ISO 6468: 1997-02 (F 1)*		☐	☐
	DIN 38407-F 3: 1998-07		☐	☐
	DIN 38407-F 37: 2013-11		☐	☐
Mono, dichlorobenzenes	DIN EN ISO 15680: 2004-04 (F 19)		☐	☐
	DIN 38407-F 43: 2014-10		☒	☒
Tri to hexachlorobenzene	**DIN EN ISO 6468: 1997-02 (F 1)***	☐	☐	☐
	DIN 38407-F 2: 1993-02	☐	☐	☐
	DIN EN ISO 15680 (F19):2004-04**	☐	☐	☐
	DIN 38407-F 43: 2014-10**	☐	☐	☐
	DIN 38407-F 37: 2013-11	☐	☐	☐
	DIN EN 16693: 2015-12 (F 51)***		☐	☐
Chlorophenols	DIN EN 12673: 1999-05 (F 15)		☐	☐
Organophosphorus and organic nitrogen compounds	DIN EN ISO 10695: 2000-11 (F 6) *		☐	☐
Polycyclic aromatic hydrocarbons (PAH) *(see also section 7)*	**DIN 38407-F 39: 2011-09**	☐	☐	☐
	DIN ISO 28540: 2014-05 (F 40)	☐	☐	☐
	DIN EN 16691: 2015-12 (F 50)		☐	☐
Hydrocarbon index	**DIN EN ISO 9377-2: 2001-07 (H 53)**	☒	☒	☒

* Mass spectrometric detection allowed
** Only applicable to trichlorobenzene
*** Only applicable to hexachlorobenzene

Section 7: HPLC methods

Parameter	Method	Was	Sur	Raw
Polycyclic aromatic hydrocarbons (PAH)* *(see also section 6)*	**DIN EN ISO 17993: 2004-03 (F 18)**	☒	☐	☐
Plant protection products and pesticides (PPP) *(The methods should be applied according to substance-specific requirements.)*	DIN EN ISO 11369: 1997-11 (F 12)*		☐	☐
	DIN 38407-F 35: 2010-10		☐	☐
	DIN 38407-F 36: 2014-09		☐	☐

* Mass spectrometric detection allowed

Section 8: Microbiological methods (not used)

Section 9.1: Biological methods, bio-assays (part 1)

Not used

Section 9.2: Biological methods, bio-assays (part 2)

Not used

8 Test method list for specialist module for SOIL AND CONTAMINATED SITES
LABO status: 20.10.2000

Test area 1: Solids, inorganic parameters

Not used

Test area 2: Solids, organic parameters

Not used

Test area 3: Solids, dioxins and furans

Not used

Test area 4: Groundwater, leachate, surface water

Test parameters	Method	
Sampling		
Sampling of groundwater	DIN EN ISO 25667, Part 2	☒
	DIN 38402-13; 1985	☒
	Länderarbeitsgemeinschaft Wasser (LAWA): Groundwater Guideline, Part 3; 03.93 AQS Information Sheet P 8/2; 01.96	☒
	Deutscher Verband für Wasserwirtschaft und Kulturbau (DVWK) (German Association for Water Management and Land Improvement): DVWK Rules 128/92 DVWK Information Sheet 245/1997	☒
Sampling of leachate	No standardised method currently available	☒
Sampling of surface water (running waters)	DIN 38402-15; 07.86	☒
	AQS Information Sheet P 8/3; 05.98	☒
Sampling of surface water (barrages and lakes)	DIN 38402-12; 06.85	☒
On site		
Temperature	DIN 38404-4; 12.76	☒
pH value	DIN 38404-5; 01.84	☒
Oxygen content	DIN EN 25814; 11.92	☒
Electrical conductivity	DIN EN 27888; 11.93	☒
Laboratory		
Elution method 1 (soil saturation extract)	According to specifications of BBodSchV (Annex 1, 3.1.2)	☐
Elution method 2 (modified S4 method)	DIN 38414-4; 10.84 taking into account the procedural instructions of BBodSchV Annex 1, 3.1.2)	☒
Laboratory		
Elution method 3 (column or lysimeter test)	No standardised method currently available; possibilities for implementation of column or lysimeter tests using the latest analysis methods must be proven	☐
Antimony (Sb)	ICP - AES based on DIN EN ISO 11885; 04.98	☒
	ICP - MS DIN 38406-29; 05.99	☐
	Hydride - AAS E DIN 38405-32; 11.96	☐
Arsenic (As)	ICP - AES based on DIN EN ISO 11885; 04.98	☒
	ICP - MS DIN 38406-29; 05.99	☐
	Hydride – AAS DIN EN ISO 11969; 11.96	☐
Lead (Pb)	ICP - AES based on DIN EN ISO 11885; 04.98	☒
	ICP - MS DIN 38406-29; 05.99	☐
	AAS E DIN 38406-6; 06.97	☐

Test parameters	Method	
Cadmium (Cd)	ICP - AES based on DIN EN ISO 11885; 04.98	☒
	ICP - MS DIN 38406-29; 05.99	☐
	AAS DIN EN ISO 5961; 05.95	☐
Chromium (Cr), total	ICP - AES based on DIN EN ISO 11885; 04.98	☒
	ICP - MS DIN 38406-29; 05.99	☐
	AAS DIN EN 1233; 08.96	☐
Chromium (Cr VI)	Spectrophotometry DIN 38405-24; 05.87	☒
	Ion chromatography DIN EN ISO 10304-3; 11.97	☐
Cobalt (Co)	ICP - AES based on DIN EN ISO 11885; 04.98	☒
	AAS DIN 38406-24; 03.93	☐
Copper (Cu)	ICP - AES based on DIN EN ISO 11885; 04.98	☒
	ICP - MS DIN 38406-29; 05.99	☐
	AAS DIN 38406-7; 09.91	☐
Molybdenum (Mo)	ICP - AES based on DIN EN ISO 11885; 04.98	☒
	ICP - MS DIN 38406-29; 05.99	☐
Nickel (Ni)	ICP - AES based on DIN EN ISO 11885; 04.98	☒
	ICP - MS DIN 38406-29; 05.99	☐
	AAS DIN 38406-11; 09.91	☐
Mercury (Hg)	AAS - cold vapour technique DIN EN 1483; 08.97	☒
Selenium (Se)	ICP - AES based on DIN EN ISO 11885; 04.98	☒
	ICP - MS DIN 38406-29; 05.99	☐
	AAS DIN 38405-23; 10.94	☐

Test parameters	Method	
Laboratory		
Zinc (Zn)	ICP - AES based on DIN EN ISO 11885; 04.98	☒
	ICP - MS DIN 38406-29; 05.99	☐
	AAS DIN 38406-8; 10.80	☐
Tin (Sn)	ICP - AES based on DIN EN ISO 11885; 04.98	☒
	ICP - MS DIN 38406-29; 05.99	☐
Cyanide, total	Spectrophotometry DIN 38405-13; 02.81	☒
	E DIN EN ISO 14403; 05.98	☒
Cyanide (CN^-), readily liberated	Spectrophotometry DIN 38405-13; 02.81	☒
Fluoride (F^-)	Fluoride-sensitive electrode DIN 38405-4; 07.85	☒
	Ion chromatography DIN EN ISO 10304-1; 04.95	☐
BTEX	GC - FID DIN 38407-9; 05.91 (note matrix load)	☐
Volatile halogenated hydrocarbons	GC - ECD DIN EN ISO 10301; 08.97	☐
Aldrin	GC - ECD, GC - MS possible DIN 38407-2; 02.93	☐
DDT	GC - ECD, GC - MS possible DIN 38407-2; 02.93	☐
Phenols	GC - ECD ISO DIS 8165-2; 01.97	☐
Chlorophenols	GC - ECD, GC - MS E DIN EN 12673; 02.97	☐
Chlorobenzenes	GC - ECD, GC - MS possible DIN 38407-2; 02.93	☐
Polychlorinated biphenyls (PCB): 6 PCB congeners (no. 28, 52, 101, 138, 163, 180, Ballschmiter)	GC - ECD, GC - MS DIN 38407-2; 02.93	☐
	E DIN 38407-3; 10.95	☐
16 PAH (EPA)	HPLC - F DIN 38407-18; 05.99	☐
Naphthalene	GC - FID, GC - MS DIN 38407-9; 05.91	☐
Petroleum hydrocarbons	Extraction with petroleum ether; Gas chromatographic determination in accordance with ISO/TR 11064; 06.94	☐

Test area 5: Soil gas, landfill gas

Not used

Test area 6: Dry and wet deposition

Not used

Test area 7: Forest soil analysis

Not used

Test area 8: Analysis for the assessment of terrestrial ecotoxicity of pollutants

Not used

9 Test method list for specialist module for SOIL AND CONTAMINATED SITES

Revised: LABO of 16.08.2012

Test area 1: Solids

Not used

Test area 2: Eluates and percolates, aqueous media

Section 2.1: Sampling and on-site examination

Sampling			
Test parameters	**Methods/notes**	**Method**	
Sampling programmes and sampling techniques		DIN EN ISO 5667-1: 2007	☒
Sampling of groundwater	The AQA information sheet P 8/2, 1996 provides further essential information on the organisation and implementation of sampling	ISO 5667-11: 2009	☒
		DIN 38402-13: 1983 (Note: Replaced by DIN ISO 5667-11)	☒
		DVGW Work Sheet S W 112: 2011	☒
Sampling of leachate using suction cups **- optional -**	The LAWA Guideline "Leachate, guideline for observation and evaluation", revised 3.4.2003 (yellow paper) provides further essential information on the organisation and implementation of sampling	DWA-M 905: 2012	☒
		DVWK-M 217: 1990 (Note: Will be updated)	☐
Sampling of surface water (running waters)	The AQA information sheet P 8/3, 1998 provides further essential information on the organisation and implementation of sampling	DIN 38402-15: 2010	☒
Sampling of surface water (barrages and lakes)		DIN 38402-12: 1985	☒

On-site testing			
Test parameters	**Methods/notes**	**Method**	
Water quality, determination of colour		DIN EN ISO 7887: 2012	☒

On-site testing			
Test parameters	**Methods/notes**	**Method**	
Water quality, determination of turbidity		DIN EN ISO 7027: 2000	☒
Odour		DEV B 1/2 1971	☒
Temperature		DIN 38404-4: 1976	☒
pH value		DIN EN ISO 10523: 2012	☒
Oxygen content		DIN EN 25814: 1992	☒
Electrical conductivity		DIN EN 27888: 1993	☒
Determination of the oxidation reduction (redox) potential	For leachate/groundwater samples, sample extraction and measuring arrangement (flow cell under exclusion of air) are decisive factors for the reliability of the result.	DIN 38 404 Teil 6: 1984	☒
Sample storage, sample pretreatment, sample transport	Note: The specifications in the respective individual standards take precedence, i.e. DIN EN ISO 5667-3 is of secondary importance	DIN EN ISO 5667-3: 2004	☒

Section 2.2: Laboratory – Analysis of eluates/percolates for inorganic parameters

Eluates/percolates			
Test parameters	**Methods/notes**	**Method**	
Batch test – Elution of inorganic substances	Liquid to solid ratio of 2 l/kg	DIN 19529: 2009	☒
Batch test – Elution of organic substances	Liquid to solid ratio of 2 l/kg	DIN 19527: 2012	☒
Batch test – Elution of inorganic substances – **optional**	Liquid to solid ratio of 10 l/kg	DIN EN 12457-4: 2003	☒
Percolation method for organic and inorganic substances **- optional -**		DIN 19528: 2009	☐
Examination for absorption availability **- optional -**		DIN 19738: 2004	☐

Analysis – Inorganic parameters			
Test parameters	**Methods/notes**	**Method**	
Antimony (Sb) Arsenic (As)	ICP-OES	DIN EN ISO 11885: 2009	☒
		DIN ISO 22036: 2009	☒
	ICP-MS	DIN EN ISO 17294-2: 2005	☐
	ET-AAS or hydride AAS	DIN ISO 20280: 2010	☐
Lead (Pb) Cadmium (Cd) Chromium (Cr), total Cobalt (Co) Copper (Cu) Molybdenum (Mo) Nickel (Ni) Zinc (Zn)	ET-AAS	DIN EN ISO 15586: 2004	☐
	ICP-OES	DIN EN ISO 11885: 2009	☒
		DIN ISO 22036: 2009	☒
	ICP-MS	DIN EN ISO 17294-2: 2005	☐
Mercury (Hg)	AAS	DIN EN 1483: 2007	☒
	Cold vapour AAS or cold vapour AFS	DIN ISO 16772: 2005	☒
Cyanide (CN-), total and cyanide, readily liberated	Spectrophotometry	DIN EN ISO 14403: 2002	☒
		DIN 38405-13: 2011	☐
		DIN EN ISO 17380: 2011	☐
Fluoride (F^-), chloride (Cl^-), sulphate (SO_4^{2-})	Ion chromatography as per the individual methods	DIN EN ISO 10304-1:2009	☒
		DIN 38405-1/ -4/ -5: 1985	☒
Vanadium (V) **- optional -**	ET-AAS	DIN EN ISO 15586: 2004	☐
	ICP-OES	DIN EN ISO 11885: 2009	☒
		DIN ISO 22036: 2009	☒
	ICP-MS	DIN EN ISO 17294-2: 2005	☐
Uranium (U) **- optional -**	ICP-MS	DIN EN ISO 17294-2: 2005	☐
Tin (Sn) Thallium (Tl) Tungsten (W) **- optional -**	ICP-OES	DIN EN ISO 11885: 2009	☒
		DIN ISO 22036: 2009	☒
	ICP-MS	DIN EN ISO 17294-2: 2005	☐
Selenium (Se) **- optional -**	ET-AAS	DIN EN ISO 15586: 2004	☐
	ICP-OES	DIN EN ISO 11885: 2009	☒
		DIN ISO 22036: 2009	☒
	ICP-MS	DIN EN ISO 17294-2: 2005	☐
	ET-AAS or hydride AAS	DIN ISO 20280: 2010	☐
Chromium (Cr VI)	Spectrophotometry	DIN 38405-24: 1987	☒
	Ion chromatography	DIN EN ISO 10304-3: 1997	☐

Section 2.3: Laboratory – Analysis of eluates/percolates for organic parameters

Eluates/percolates			
Test parameters	**Methods/notes**	**Method**	
Batch test – Elution of inorganic substances	Liquid to solid ratio of 2 l/kg	DIN 19529: 2009	☒
Batch test – Elution of organic substances	Liquid to solid ratio of 2 l/kg	DIN 19527: 2012	☒
Batch test – Elution of inorganic substances – **optional**	Liquid to solid ratio of 10 l/kg	DIN EN 12457-4: 2003	☒
Percolation method for organic and inorganic substances **- optional -**		DIN 19528: 2009	☐
Examination for absorption availability **- optional -**		DIN 19738: 2004	☐

Analysis – Organic parameters			
Test parameters	**Methods/notes**	**Method**	
Note on volatile compounds (especially BTEX, LHKW): The preparation of eluates and percolates for the subsequent determination of volatile substances is prone to error due to the high rate of loss. These compounds can therefore only be determined from directly extracted leachate, groundwater and surface water. Because of the negative pressure effects, only submersible pumps and not suction pumps should be used with these compounds when taking groundwater samples.			
BTEX aromatics: Benzene, toluene, ethylbenzene, xylenes, styrene	Purge + trap / desorption, GC-MS	DIN EN ISO 15680: 2004	☐
	Liquid extraction and headspace, GC	DIN 38407-9: 1991	☒
	Headspace-SPME, GC-MS	DIN 38407-41: 2011	☐
Volatile halogenated hydrocarbons (VOC) Individual parameters as per standard	Purge + trap / desorption, GC-MS	DIN EN ISO 15680: 2004	☐
	Liquid extraction and headspace, GC	DIN EN ISO 10301: 1997	☒
	Headspace-SPME, GC-MS	DIN 38407-41: 2011	☐
Aldrin	GC-ECD, GC-MS	DIN EN ISO 6468: 1997	☐
		DIN 38407-2: 1993	☐
Dichlorodiphenyltrichloroethane (DDT)	GC-ECD, GC-MS	DIN EN ISO 6468: 1997	☐
		DIN 38407-2: 1993	☐
Chlorophenols	GC-ECD, GC-MS	DIN EN 12673: 1999	☐
Chlorobenzenes (Cl3-Cl6)	GC-ECD, GC-MS	DIN 38407-2: 1993	☐
	Liquid extraction, GC-ECD, GC-MS	DIN EN ISO 6468: 1997	☐
Chlorobenzenes (Cl1-Cl3)	Liquid extraction and headspace, GC-ECD (MS where applicable)	DIN EN ISO 10301: 1997	☐

Analysis – Organic parameters			
Test parameters	**Methods/notes**	**Method**	
Note on volatile compounds (especially BTEX, LHKW): The preparation of eluates and percolates for the subsequent determination of volatile substances is prone to error due to the high rate of loss. These compounds can therefore only be determined from directly extracted leachate, groundwater and surface water. Because of the negative pressure effects, only submersible pumps and not suction pumps should be used with these compounds when taking groundwater samples.			
Polychlorinated biphenyls (PCB6 / PCB7): PCB6 congeners 28, 52, 101, 138, 153, 180, and 118	GC-ECD, GC-MS The type of summation must be indicated (PCB6 / PCB7)	DIN 38407-2: 1993	☐
		DIN 38407-3: 1998	☐
16 PAH (EPA) (For HPLC without acenaphthylene)	GC-MS	DIN EN ISO 17993: 2004	☒
	HPLC-F	DIN 38407-39: 2011	☐
Naphthalene	GC-FID, GC-MS	DIN EN ISO 15680: 2004	☐
		DIN 38407-9: 1991	☒
Petroleum hydrocarbons (MKW, C_{10}-C_{40})	GC-FID	DIN EN ISO 9377-2: 2001	☒
Typical explosive compounds (HPLC) (2-nitrotoluene, 3-nitrotoluene, 4-nitrotoluene, 2,4-dinitrotoluene, 2,6-dinitrotoluene, 2,4,6-trinitrotoluene, 2-amino-4,6-dinitrotoluene, 4-amino-2,6-dinitrotoluene, nitropenta (PETN), hexogen, 2,4,6-trinitrophenol (picric acid), nitrobenzene, 1,3-dinitrobenzene, 1,3,5-trinitrobenzene, hexanitro-diphenylamine (hexyl), N-methyl-N,2,4,6-tetranitroaniline, octogen (HMX)) **- optional -**	Determination of certain explosives and related compounds – Method using HPLC / UV detection	DIN EN ISO 22478: 2006	☐
Typical explosive compounds (GC) (2-nitrotoluene, 3-nitrotoluene, 4-nitrotoluene, 2,4-dinitrotoluene, 2,6-dinitrotoluene, 2,4,6-trinitrotoluene, 2-amino-4,6-dinitrotoluene, 4-amino-2,6-dinitrotoluene, nitrobenzene, 1,3-dinitrobenzene, 1,3,5-trinitrobenzene) **- optional -**	Determination of selected nitroaromatic compounds by gas-liquid chromatography	DIN 38407-17: 1999	☐

Analysis – Organic parameters			
Test parameters	**Methods/notes**	**Method**	
Note on volatile compounds (especially BTEX, LHKW): The preparation of eluates and percolates for the subsequent determination of volatile substances is prone to error due to the high rate of loss. These compounds can therefore only be determined from directly extracted leachate, groundwater and surface water. Because of the negative pressure effects, only submersible pumps and not suction pumps should be used with these compounds when taking groundwater samples.			
Phenols (Phenol, 2-methylphenol; 3-methylphenol; 4-methylphenol, 2,3-dimethylphenol; 2,4-dimethylphenol; 2,5-dimethylphenol; 2,6-dimethylphenol; 3,4-dimethylphenol; 3,5-dimethylphenol; 2-ethylphenol; 3-ethylphenol; 4-ethylphenol; 2,3,5-trimethylphenol; 2,3,6-trimethylphenol; 2,4,6-trimethylphenol; 3,4,5-trimethylphenol) **- optional -**	GC-ECD, GC-MS	ISO 8165-2: 1999	☐
		DIN EN 12673: 1999	☐

Test area 3 – Soil gas, landfill gas
Section 3.1: Sampling and on-site examination

Not used

For the requirements for the sampling of water, soil and soil gas on federal properties, full competence is confirmed in accordance with the construction guideline "Arbeitshilfen Boden- und Grundwasserschutz" (soil and groundwater protection aids) (BfR AH BoGwS), Annex 2.5.

10 Test method list for specialist module for WASTE

Revised: LAGA, May 2018

Test area 1: Sewage sludge

	Sections / Parameters	**Basis /** Methods	
		AbfKlärV	
1.1	**Sampling and sample preparation**	**Section 32 (3) and (4) AbfKlärV**	
a)	**Sampling**	**DIN EN ISO 5667-13 (08.11) and DIN 19698-1 (05.14)**	☒
b)	**Sample preparation**	**DIN 19747 (07.09)**	☒

Sections 1.2 to 1.8

Not used

Test area 2: Base

	Sections / Parameters	**Basis /** Methods	
		AbfKlärV and BioAbfV	
2.1	**Sampling and sample preparation**	**Section 32 (2) AbfKlärV and Section 9 BioAbfV**	
a)	**Sampling**	**DIN ISO 10381-1 (08.03) and DIN ISO 10381-4 (04.04)**	☒
b)	**Sample preparation**	**DIN ISO 19747 (07.09)**	☒

Sections 2.2 to 2.5

Not used

Test area 3: Biowaste

Not used

Test area 4: Waste oil, insulating liquid

Section 4.1

Not used

	Sections/ Parameter	**Basis/** Method	
4.2	**PCB, halogen (only in accordance with AltölV)**	**Annex 2 No. 2, 3**	
	PCB	**DIN EN 12766- 1 (11.00) in conjunction with DIN EN 12766- 2 (12.01), Method B**	☒
	Total halogen (for AltölV only)	**Annex 2, No. 3 AltölV**	☒

Test area 5: Landfill waste

	Sections/ Parameter	**Basis/** Method	
		Section 6 (2), Section 8 (1), (3) and (5) DepV	
5.1	**Sampling**	**LAGA PN 98 (12.01)**	☒

5.2	**Determination of total content in solid**		
	Sample preparation	**DIN 19747 (07.09)**	☒
	Digestion method (aqua regia)	**DIN EN 13657 (01.03)**	☒
	Loss on ignition	**DIN EN 15169 (05.07)**	☒
	TOC (total organic carbon)	**DIN EN 13137 (12.01)**	☒
	BTEX (benzene and derivatives)	**DIN 38407-F9 (05.91)** **Handbuch Altlasten HLUG, Volume 7, Methods of analysis, Part 4 (2000)**	☒
		DIN EN ISO 22155 (07.16)	☒
	PCB (polychlorinated biphenyls)	**DIN EN 15308 (05.08)**	☒
	Petroleum hydrocarbons	**DIN EN 14039 (01.05) in conjunction with LAGA KW/04 (12.09)**	☒
	PAH (polycyclic aromatic hydrocarbons)	**DIN ISO 18287 (05.06)**	☒
	Density	**DIN 18125- 2 (03.11)**	☐
	Gross calorific value	**DIN EN 15170 (05.09)**	☒
	Cadmium, chromium, copper, nickel, lead and zinc	**DIN ISO 11047 (05.03)**	☐
		DIN EN ISO 11885 (09.09)	☒
		DIN ISO 22036 (06.09)	☒
	Mercury	**DIN EN 12846 (08.12)* a method incorrectly specified in legislation; DIN EN ISO 12846 (08.12) correct**	☒
		DIN EN ISO 17852 (04.08)	☐
	Extractable lipophilic substances	**LAGA KW/04 (12.09)**	☒

5.3	**Determination of contents in eluate**		
	Eluate preparation with liquid/solid ratio 10/1	**DIN EN 12457- 4 (01.03)**	☒
	Eluate preparation each with constant pH 4 and 11 / acid neutralisation capacity	**LAGA Guideline EW 98 (2002)**	☐
	Up-flow percolation test	**DIN CEN/TS 14405 (09.04)**	☐
		DIN 19528 (01.09)	☐
	pH value of eluate	**DIN 38404- 5 (07.09)**	☒
	DOC	**DIN EN 1484 (08.97)**	☒
	DOC at a pH between 7.5 and 8	**LAGA Guideline EW 98 p (2002)**	☐

	Phenols	**DIN 38409- 16 (06.84)**	☐
		DIN EN ISO 14402 (12.99)	☒
		DIN 38407- 27 (10.12)	☐
	Arsenic	**DIN EN ISO 11969 (11.96)**	☐
		DIN EN ISO 11885 (09.09)	☒
		DIN ISO 22036 (06.09)	☒
		DIN EN ISO 15586 (02.04)	☐
		DIN EN ISO 17294- 2 (02.05)	☐
		DIN EN ISO 17294-2 (01.17)	☐
	Lead, cadmium, copper, nickel, zinc, chromium	**DIN EN ISO 15586 (02.04)**	☐
		DIN EN ISO 17294- 2 (02.05)	☐
		DIN EN ISO 11885 (09.09)	☒
		DIN ISO 22036 (06.09)	☒
		DIN EN ISO 17294-2 (01.17)	☐
	Mercury	**DIN EN ISO 12846 (08.12)**	☒
		DIN EN ISO 17852 (04.08)	☐
	Barium, molybdenum, selenium	**DIN ISO 22036 (06.09)**	☒
		DIN EN ISO 11885 (09.09)	☒
		DIN EN ISO 17294- 2 (02.05)	☐
		DIN EN ISO 17294-2 (01.17)	☐
	Antimony	**DIN ISO 22036 (06.09)**	☒
		DIN EN ISO 11885 (09.09)	☒
		DIN EN ISO 15586 (02.04)	☐
		DIN 38405- 32 (05.00)	☐
		DIN EN ISO 17294- 2 (02.05)	☐
		DIN EN ISO 17294-2 (01.17)	☐
	Total dissolved solids	**DIN EN 15216 (01.08)**	☒
		DIN 38409- 1 (01.87)	☒
		DIN 38409- 2 (03.87)	☒
	Conductivity of eluate	**DIN EN 27888 (11.93)**	☒
	Determination of dry residue	**DIN EN 14346 (03.07)**	☒

	Chloride	**DIN EN ISO 10304- 1 (07.09)**	☒
		DIN 38405- 1 (12.85)	☐
		DIN EN ISO 15682 (01.02)	☐
	Sulphate	**DIN EN ISO 10304- 1 (07.09)**	☒
		DIN 38405- 5 (01.85)	☐
	Cyanide, readily liberated	**DIN 38405- 13 (04.11)**	☒
		In waste containing sulphide: **DIN ISO 17380 (05.06)**	☒
		DIN EN ISO 14403- 1 (10.12)	☐
	Fluoride	**DIN 38405- 4 (07.85)**	☒
		DIN EN ISO 10304- 1 (07.09)	☐

Section 5.4

Not used

Test area 6: Wood waste

	Sections/ Parameter	**Basis/** Method	
		AltholzV	
6.1	**Sampling and sample preparation**	**Section 6 (6) AltholzV**	
a)	**Sampling**	LAGA PN 98 in conjunction with **Annex IV No. 1.1, AltholzV**	☒
b)	**Sample preparation**	DIN 19747 (07.09) in conjunction with **Annex IV No. 1.3**	☒
	Preparation of laboratory sample	DIN 19747 (07.09) in conjunction with **DIN 51701- 3 (08.85)**	☒
	Moisture content	**DIN 52183 (11.77)**	☒

6.2	**Heavy metals**	**Annex IV No. 1.4.3 AltholzV**	
	Aqua regia digestion	**E DIN EN 13657 (10.99)**	☐
		DIN EN 13657 (01.03)	☒

	Arsenic (from aqua regia digestion)	**DIN EN ISO 11969 (11.96)**	☐
		DIN ISO 11047 (05.03)	☐
		DIN EN ISO 11885 (09.09)	☒
		DIN EN ISO 22036 (06.09)	☒
		DIN EN ISO 17294- 2 (01.17)	☐
	Lead (from aqua regia digestion)	**DIN 38406- 6 (07.98)**	☐
		DIN EN ISO 11885 (04.98)	☐
		DIN ISO 11047 (05.98)	☐
		DIN ISO 11047 (05.03)	☐
		DIN EN ISO 17294- 2 (01.17	☐
		DIN EN ISO 11885 (09.09)	☒
		DIN EN ISO 22036 (06.09)	☒
	Cadmium (from aqua regia digestion)	**DIN EN ISO 5961 (05.95)**	☐
		DIN EN ISO 11885 (04.98)	☐
		DIN ISO 11047 (06.95)	☐
		DIN ISO 11047 (05.03)	☐
		DIN EN ISO 17294-2 (01.17)	☐
		DIN EN ISO 11885 (09.09)	☒
		DIN EN ISO 22036 (06.09)	☒
	Chromium (from aqua regia digestion)	**DIN EN 1233 (08.96)**	☐
		DIN EN ISO 11885 (04.98)	☐
		DIN ISO 11047 (06.95)	☐
		DIN ISO 11047 (05.03)	☐
		DIN EN ISO 17294-2 (01.17)	☐
		DIN EN ISO 11885 (09.09)	☒
		DIN EN ISO 22036 (06.09)	☒

	Copper (from aqua regia digestion)	**DIN 38406- 7 (09.91)**	☐
		DIN EN ISO 11885 (04.98)	☐
		DIN ISO 11047 (06.95)	☐
		DIN ISO 11047 (05.03)	☐
		DIN EN ISO 17294-2 (01.17)	☐
		DIN EN ISO 11885 (09.09)	☒
		DIN EN ISO 22036 (06.09)	☒
	Mercury (from aqua regia digestion)	**DIN EN 1483 (08.97)**	☒
		DIN EN ISO 12338 (10.98)	☐
		DIN EN ISO 12846 (08.12)	☐
		DIN EN ISO 17852 (04.08)	☐

	Sections/ Parameter	**Basis/** Method	
6.3	**Halogens**	**Annex IV No. 1.4.2 AltholzV**	
	Fluorine, chlorine	**DIN 51727 (06.01)**	☒
		DIN 51727 (11.11)	☐
		DIN EN 14582 (06.07) **in conjunction with DIN EN ISO 10304- 1 (04.95)**	☒
		DIN EN ISO 10304- 1 (07.09)	☐
6.4	**Organic parameters**	**Annex IV No. 1.4.4 and 1.4.5 AltholzV**	
	Pentachlorophenol (PCP)	**Annex IV AltholzV, No. 1.4.4**	☒
		DIN ISO 14154 (12.05)	☐
	Polychlorinated biphenyls (PCB)	**Annex IV AltholzV, No. 1.4.5 in conjunction with DIN 38414- 20 (01.96)**	☒

11 Sampling, sample preparation and analysis of waste in accordance with the German Landfill Ordinance, Annex 4 (July 2020)

DepV, Annex 4	Parameter	Section 8 (1), (3) and (5) DepV	
2	**Sampling**	LAGA PN 98 (May 2019)	☒
3	**Determination of total content in solid and elutable fraction**		
3.1	Determination of total content in solid		
3.1.1	Sample preparation	DIN 19747 (July 2009)	☒
3.1.2	Digestion method (aqua regia)	DIN EN 13657 (January 2003)	☒
3.1.3	Organic portion of the dry residue of the original substance		
3.1.3.1	Loss on ignition	DIN EN 15169 (May 2007)	☒
3.1.3.2	TOC (total organic carbon)	DIN EN 15936 (November 2012)	☒
3.1.4	BTEX (benzene, toluene, ethylbenzene, o, m, p-xylene, styrene, cumene)	DIN EN ISO 22155 (July 2016)	☒
3.1.5	PCB (polychlorinated biphenyls – Sum of the 7 PCB congeners, PCB 28, 52, 101, 118, 138, 153, 180)	DIN EN 15308 (December 2016)	☒
3.1.6	Petroleum hydrocarbons (C_{10} to C_{40})	DIN EN 14039 (January 2005) in conjunction with LAGA KW/04 (September 2019)	☒
3.1.7	PAH (polycyclic aromatic hydrocarbons)	DIN ISO 18287 (May 2006)	☒
3.1.8	Density	DIN 18125-2 (March 2011)	☐
3.1.9	Gross calorific value	DIN EN 15170 (May 2009)	☒
03 January 2010	Cadmium, chromium, copper, nickel, lead, zinc	DIN EN ISO 17294-2 (January 2017)	☐
		DIN ISO 22036 (June 2009)	☒
		DIN EN ISO 11885 (E 22) (September 2009)	☒
03 January 2011	Mercury	DIN EN ISO 12846 (E 12) (August 2012)	☒
		DIN EN ISO 17852 (E 35) (April 2008)	☐
03 January 2012	Extractable lipophilic substances	LAGA KW/04 (September 2019)	☒
3.2	Determination of contents in eluate		

DepV, Annex 4	Parameter	Section 8 (1), (3) and (5) DepV	
3.2.1	Eluate preparation		
3.2.1.1	Eluate preparation with liquid/solid ratio 10/1	DIN EN 12457-4 (January 2003)	☒
3.2.1.2	Eluate preparation each with constant pH 4 and 11 / acid neutralisation capacity	LAGA Guideline EW 98 (September 2017)	☐
3.2.2	Up-flow percolation test	DIN 19528 (January 2009)	☐
		DIN EN 14405 (May 2017)	☐
3.2.3	pH value of eluate	DIN EN ISO 10523 (April 2012)	☒
3.2.4	DOC (dissolved organic carbon)		
3.2.4.1	DOC	DIN EN 1484 (April 2019)	☒
3.2.4.2	DOC at a pH between 7.5 and 8	LAGA Guideline EW 98 (September 2017)	☐
3.2.5	Phenols	DIN 38409-H 16 (June 1984)	☒
		DIN EN ISO 14402 (H 37) (December 1999)	☒
3.2.6	Arsenic	DIN EN ISO 17294-2 (January 2017)	☐
		DIN EN ISO 11885 (E 22) (September 2009)	☒
		DIN ISO 22036 (June 2009)	☒
3.2.7	Lead	DIN EN ISO 17294-2, (January 2017)	☐
		DIN ISO 22036 (June 2009)	☒
		DIN EN ISO 11885 (E 22) (September 2009)	☒
3.2.8	Cadmium	DIN EN ISO 17294-2, (January 2017)	☐
		DIN ISO 22036 (June 2009)	☒
		DIN EN ISO 11885 (E 22) (September 2009)	☒
3.2.9	Copper	DIN EN ISO 17294-2, (January 2017)	☐
		DIN ISO 22036 (June 2009)	☒
		DIN EN ISO 11885 (E 22) (September 2009)	☒

DepV, Annex 4	Parameter	Section 8 (1), (3) and (5) DepV	
3.2.10	Nickel	DIN EN ISO 17294-2, (January 2017)	☐
		DIN ISO 22036 (June 2009)	☒
		DIN EN ISO 11885 (E 22) (September 2009)	☒
3.2.11	Mercury	DIN EN ISO 12846 (E 12) (August 2012)	☒
		DIN EN ISO 17852 (E 35) (April 2008)	☐
3.2.12	Zinc	DIN EN ISO 17294-2, (January 2017)	☐
		DIN ISO 22036 (June 2009)	☒
		DIN EN ISO 11885 (E 22) (September 2009)	☒
3.2.13	Chloride	DIN EN ISO 10304-1 (D 20) (July 2009)	☒
		DIN EN ISO 15682 (D 31) (January 2002)	☐
3.2.14	Sulphate	DIN EN ISO 10304-1 (D 20) (July 2009)	☒
3.2.15	Cyanide, readily liberated	DIN 38405-D 13 (April 2011)	☒
		In waste containing sulphide: DIN ISO 17380 (May 2006)	☒
		DIN EN ISO 14403-1 (D 2) (October 2012)	☐
		DIN EN ISO 14403-2, (October 2012)	☐
3.2.16	Fluoride	DIN 38405-D 4 (July 1985)	☒
		DIN EN ISO 10304-1 (D 20) (July 2009)	☐
3.2.17	Barium	DIN ISO 22036 (June 2009)	☒
		DIN EN ISO 11885 (E 22) (September 2009)	☒
		DIN EN ISO 17294-2 (E 29) (January 2017)	☐

DepV, Annex 4	Parameter	Section 8 (1), (3) and (5) DepV	
3.2.18	Chromium, total	DIN ISO 22036 (June 2009)	☒
		DIN EN ISO 11885 (E 22) (September 2009)	☒
		DIN EN ISO 17294-2 (January 2017)	☐
3.2.19	Molybdenum	DIN ISO 22036 (June 2009)	☒
		DIN EN ISO 11885 (E 22) (September 2009)	☒
		DIN EN ISO 17294-2 (E 29) (January 2017)	☐
3.2.20	Antimony	DIN ISO 22036 (June 2009)	☒
		DIN EN ISO 11885 (E 22) (September 2009)	☒
		DIN 38405-D 32 (May 2000)	☐
		DIN EN ISO 17294-2 (E 29) (January 2017)	☐
3.2.21	Selenium	DIN ISO 22036 (June 2009)	☒
		DIN EN ISO 11885 (E 22) (September 2009)	☒
		DIN EN ISO 17294-2 (E 29) (January 2017)	☐
3.2.22	Total dissolved solids	DIN EN 15216 (January 2008)	☒
		DIN 38409-H 1 (January 1987)	☒
		DIN 38409-H 2 (March 1987)	☒
3.2.23	Conductivity of eluate	DIN EN 27888 (C 8) (November 1993)	☒
3.2.24	Determination of dry residue	DIN EN 14346 (March 2007)	☒
3.3	Biodegradability of the dry residue of the original substance		
3.3.1	Breathability over 4 days (AT_4)		☐
3.3.2	Gas formation rate in fermentation test over 21 days (GB_{21})		☐

Abbreviations used:

AbfKlärV	Klärschlamm-Verordnung (German Sewage Sludge Ordinance)
AltholzV	German Waste Wood Ordinance
ASTM	American Society for Testing Materials
BAM	Bundesanstalt für Materialforschung und -prüfung (Federal Institute for Materials Research and Testing)
DepV	German Landfill Ordinance
DEV	Deutsche Einheitsverfahren (German standard methods)
DIN	Deutsches Institut für Normung (German Institute for Standardization)
DVWK	Deutscher Verband für Wasserwirtschaft und Kulturbau (German Association for Water Management and Land Improvement)
EN	European standard
EPA	Environmental Protection Agency, USA
HLUG	Hessisches Landesamt für Umwelt und Geologie (Hessian Agency for Nature Conservation, Environment and Geology)
IEC	International Electrotechnical Commission
ISO	International Organization for Standardization
LABO	Bund/Länder-Arbeitsgemeinschaft Bodenschutz (Federal/Regional Working Group on Soil Protection)
LAGA	Bund/Länder-Arbeitsgemeinschaft Abfall (Federal/Regional Working Group on Waste)
LAWA	Bund/Länder-Arbeitsgemeinschaft Wasser (Federal/Regional Working Group on Water)
OFD H	Oberfinanzdirektion Hannover (Hanover Regional Finance Office)
TA	Technische Anleitung (technical instruction)
TP Min-StB	Technical testing requirements for aggregates in road construction
UBA	Umweltbundesamt (Federal Environment Agency)
VDA	Verband der Automobilindustrie (Association of the German Automotive Industry)
VDI	Verband Deutscher Ingenieure (Association of German Engineers)
VDLUFA	Verband Deutscher Landwirtschaftlicher Untersuchungs- und Forschungsanstalten (Association of German Agricultural Testing and Research Institutions)
AWVP-...	In-house method of AWV Dr. Busse GmbH