Final Version of the Reviewed Best Available Techniques Reference Document (BREF) for Waste Incineration and Steps Towards Implementing BAT Conclusions in EU Member States

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The Best Available Techniques Reference Documents (BREF) are a central point of technical environmental protection in Europe. This involves connected to the Industrial Emissions Directive (IED) a higher liability of the BREF-Document because they will be updated regularly. Even their further implementation and monitoring at the national level are laid down precisely [2].

The term *Best Available Techniques (BAT)* in conjunction with Reference Document and their liability is, taking into account the recitals of the IED, one of the central elements of the IED (IPPC amendment).

In order to determine best available techniques and to limit imbalances in the Union as regards the level of emissions from industrial activities, reference documents for best available techniques (*BAT reference documents*) should be drawn up, reviewed and, where necessary updated through an exchange of information with stakeholders. The *BAT conclusions* as the key elements of BAT reference documents are adopted through committee procedure.

The principal targets of the Industrial Emissions Directive about the concept of BAT describe the following definitions [1]:

- *Best available techniques* means the most effective and advanced stage in the development of activities and their methods of operation which indicates the practical suitability of particular techniques for providing the basis for emission limit values and other permit conditions designed to prevent and, where that is not practicable, to reduce emissions and the impact on the environment as a whole:
- (a) *techniques* includes both the technology used and the way in which the installation is designed, built, maintained, operated and decommissioned;
- (b) *available techniques* means those developed on a scale which allows implemen-

tation in the relevant industrial sector, under economically and technically viable conditions, taking into consideration the costs and advantages, whether or not the techniques are used or produced inside the Member State in question, as long as they are reasonably accessible to the operator;

- *BAT reference document* means a document, resulting from the exchange of information organized pursuant to Article 13, drawn up for defined activities and describing, in particular, applied techniques, present emissions and consumption levels, techniques considered for the determination of best available techniques as well as BAT conclusions and any emerging techniques, giving special consideration to the criteria listed in Annex III;
- *BAT conclusions* means a document containing the parts of a BAT reference document laying down the conclusions on best available techniques, their description, information to assess their applicability, the emission levels associated with the best available techniques, associated monitoring, associated consumption levels and, where appropriate, relevant site remediation measures;
- *Emission levels associated with the best available techniques* means the range of emission levels obtained under normal operating conditions using a best available technique or a combination of best available techniques, as described in BAT conclusions, expressed as an average over a given period of time, under specified reference conditions.

1. The BREF activities in the context of the Industrial Emissions Directive

The BREFs and their application under the IED are a central point for permits of installations and the operation of the monitoring system. The stated goal is that the permit conditions base on the Best Available Techniques. The permit should include all measures that are required for a high level of protection for the environment as a whole and is in place to ensure that the facility operate in accordance with the general principles of the basic obligations of operators.

The BAT process is a key tool to ensure a degree of uniformity across all Member States of the Union and thereby in the EU 28 (27 after Brexit) of central importance.

The activities on the BREF *Waste Incineration* had started at 12 May 2014 as the *Seville Bureau* announced the official launch of the European work on revision of the document.

Nearly five years later the Article 13 forum of the Industrial Emissions Directive gave its opinion on the final draft of the revised Waste Incineration (WI) BREF on February 27, 2019. It was the last time for a real discussion nevertheless there were only minor chance for changes because any changes need a large majority. The Forum's opinion, including the list of comments on the draft WI BREF that were consensual within the Forum and that were representing the views of certain members of the Forum are still available for members of the technical Working Group (TWG) in specific folders at BATIS.

On Monday June 17, 2019, the BAT conclusions for Waste Incineration received a positive vote of the IED Article 75 Committee. The final version of the draft Commission Implementing Decision are submitted for adoption by the Commission and will be published in the Official Journal of the European Union in autumn of this year.

For members of the TWG the version of the BAT conclusions that was submitted to the IED Article 75 Committee are also laid down in specific folder on BATIS.

On July 19, 2019, the European Commission sent to the Member States the draft of the translation of Chapter 5 into their respective official languages with a request for commentary until September 16, 2019.

The following chapter presents the main contents of the BAT conclusions, with the focus of the presentation on the emission-reducing requirements based on the emission levels.

2. Best Available Techniques Conclusions for Waste Incineration

Scope

These BAT conclusions concern the following activities specified in Annex I to Directive 2010/75/EU:

5.2. Disposal or recovery of waste in waste incineration plants:

(a) for non-hazardous waste with a capacity exceeding 3 tonnes per hour;

(b) for hazardous waste with a capacity exceeding 10 tonnes per day.

5.2. Disposal or recovery of waste in waste co-incineration plants:

(a) for non-hazardous waste with a capacity exceeding 3 tonnes per hour;

(b) for hazardous waste with a capacity exceeding 10 tonnes per day;

whose main purpose is not the production of material products and where at least one of the following conditions is fulfilled:

- only waste, other than waste defined in Article 3(31)(b) of Directive 2010/75/EU, is combusted;
- more than 40 % of the resulting heat release comes from hazardous waste;
- mixed municipal waste is combusted.

5.3. (a) Disposal of non-hazardous waste with a capacity exceeding 50 tonnes per day involving the treatment of slags and/or bottom ashes from the incineration of waste.

5.3. (b) Recovery, or a mix of recovery and disposal, of non-hazardous waste with a capacity exceeding 75 tonnes per day involving the treatment of slags and/or bottom ashes from the incineration of waste.

5.1. Disposal or recovery of hazardous waste with a capacity exceeding 10 tonnes per day involving the treatment of slags and/or bottom ashes from the incineration of waste.

These BAT conclusions do not address the following:

- Pre-treatment of waste prior to incineration. This may be covered by the BAT conclusions for Waste Treatment (WT).
- Treatment of incineration fly ashes and other residues resulting from flue-gas cleaning (FGC). This may be covered by the BAT conclusions for Waste Treatment (WT).
- Incineration or co-incineration of exclusively gaseous waste, other than that resulting from the thermal treatment of waste.
- Treatment of waste in plants covered by Article 42(2) of Directive 2010/75/EU.

Other BAT conclusions and reference documents that could be relevant for the activities covered by these BAT conclusions are the following:

- Waste Treatment (WT);
- Economics and Cross-Media Effects (ECM);
- Emissions from Storage (EFS);
- Energy Efficiency (ENE);
- Industrial Cooling Systems (ICS);
- Monitoring of Emissions to Air and Water from IED Installations (ROM);
- Large Combustion Plants (LCP);
- Common Waste Water and Waste Gas Treatment/Management Systems in the Chemical Sector (CWW).

General considerations

Best Available Techniques

The techniques listed and described in these BAT conclusions are neither prescriptive nor exhaustive. Other techniques may be used that ensure at least an equivalent level of environmental protection.

Unless otherwise stated, these BAT conclusions are generally applicable.

Emission levels associated with the best available techniques (BAT-AELs) for emissions to air

Emission levels associated with the best available techniques (BAT-AELs) for emissions to air given in these BAT conclusions refer to concentrations, expressed as mass of emitted substances per volume of flue-gas or of extracted air under the following standard conditions: dry gas at a temperature of 273.15 K and a pressure of 101.3 kPa, and expressed in mg/Nm^3, $\mu g/Nm^3$, ng I-TEQ/Nm^3 or ng WHO-TEQ/Nm^3.

Emission levels associated with the best available techniques (BAT-AELs) for emissions to water

Emission levels associated with the best available techniques (BAT-AELs) for emissions to water given in these BAT conclusions refer to concentrations (mass of emitted substances per volume of wastewater), expressed in mg/l or ng I-TEQ/l.

For wastewater from FGC, the BAT-AELs refer either to spot sampling (for TSS only) or to daily averages, i.e. 24-hour flow-proportional composite samples. Time-proportional composite sampling can be used provided that sufficient flow stability is demonstrated.

For wastewater from bottom ash treatment, the BAT-AELs refer to either of the following two cases:

- in the case of continuous discharges, daily average values, i.e. 24-hour flow-proportional composite samples;
- in the case of batch discharges, average values over the release duration taken as flow-proportional composite samples, or, provided that the effluent is appropriately mixed and homogeneous, a spot sample taken before discharge.

The BAT-AELs for emissions to water apply at the point where the emission leaves the installation.

The following text gives a summary of new BAT conclusions and the associated emission levels, which primarily relate closely to waste incineration (WI):

BAT 14 In order to improve the overall environmental performance of the incineration of waste, to reduce the content of unburnt substances in slags and bottom ashes, and to reduce emissions to air from the incineration of waste, BAT is to use an appropriate combination of the techniques described under BAT 14 in the table below.

Table 1: Techniques to reduce the content of unburnt substances in slags and bottom ashes and emissions to air from the incineration of waste

	Technique	Description	Applicability
a.	Waste blending and mixing	Waste blending and mixing prior to incineration includes for example the following operations: • bunker crane mixing; • using a feed equalisation system; • blending of compatible liquid and pasty wastes. In some cases, solid wastes are shredded prior to mixing.	Not applicable where direct furnace feeding is required due to safety considerations or waste characteristics (e.g. infectious clinical waste, odorous wastes, or wastes that are prone to releasing volatile substances). Not applicable where undesired reactions may occur between different types of waste (see BAT 9 f).
b.	Advanced control system		Generally applicable.
c.	Optimisation of the incineration process		Optimisation of the design is not applicable to existing furnaces.

Table 2: BAT-associated environmental performance levels for unburnt substances in slags and bottom ashes from the incineration of waste

Parameter	Unit	BAT-AEPL
TOC content in slags and bottom ashes [1]	Dry wt-%	1 – 3 [2]
Loss on ignition of slags and bottom ashes [1]	Dry wt-%	1 – 5 [2]

[1] Either the BAT-AEPL for TOC content or the BAT-AEPL for the loss on ignition applies.
[2] The lower end of the BAT-AEPL range can be achieved when using fluidised bed furnaces or rotary kilns operated in slagging mode.

Channelled emissions to air

Emissions of dust, metals and metalloids

BAT 25 In order to reduce channelled emissions to air of dust, metals and metalloids from the incineration of waste, BAT is to use one or a combination of the techniques described under BAT 25 in the table below.

Table 3: Techniques to reduce channelled emissions to air of dust, metals and metalloids from the incineration of waste

	Technique	Description	Applicability
a.	Bag filter		Generally applicable to new plants. Applicable to existing plants within the constraints associated with the operating temperature profile of the FGC system.
b.	Electrostatic precipitator		Generally applicable.
c.	Dry sorbent injection	Not relevant for the reduction of dust emissions. Adsorption of metals by injection of activated carbon or other reagents in combination with a dry sorbent injection system or a semi-wet absorber that is used to reduce acid gas emissions.	Generally applicable.
d.	Wet scrubber	Wet scrubbing systems are not used to remove the main dust load but, installed after other abatement techniques, to further reduce the concentrations of dust, metals and metalloids in the flue-gas.	There may be applicability restrictions due to low water availability, e.g. in arid areas.
e.	Fixed- or moving-bed adsorption	The system is used mainly to adsorb mercury and other metals and metalloids as well as organic compounds including PCDD/F, but also acts as an effective polishing filter for dust.	The applicability may be limited by the overall pressure drop associated with the FGC system configuration. In the case of existing plants, the applicability may be limited by a lack of space.

Table 4: BAT-associated emission levels (BAT-AELs) for channelled emissions to air of dust, metals and metalloids from the incineration of waste

Parameter	BAT-AEL mg/Nm³	Averaging period
Dust	< 2 – 5 (1)	Daily average
Cd+Tl	0.005 – 0.02	Average over the sampling period
Sb+As+Pb+Cr+Co+Cu+Mn+Ni+V	0.01 – 0.3	Average over the sampling period

(1) For existing plants dedicated to the incineration of hazardous waste and for which a bag filter is not applicable, the higher end of the BAT-AEL range is 7 mg/Nm³

Emissions of HCl, HF and SO_2

BAT 27 In order to reduce channelled emissions of HCl, HF and SO_2 to air from the incineration of waste, BAT is to use one or a combination of the techniques described under BAT 27 in the table below.

Table 5: Techniques to reduce channelled emissions to air of HCl, HF and SO_2 from the incineration of waste

	Technique	Description	Applicability
a.	Optimised and automated reagent dosage	The use of continuous HCl and/or SO_2 measurements (and/or of other parameters that may prove useful for this purpose) upstream and/or downstream of the FGC system for the optimisation of the automated reagent dosage.	Generally applicable.
b.	Recirculation of reagents	The recirculation of a proportion of the collected FGC solids to reduce the amount of unreacted reagent(s) in the residues.	Generally applicable to new plants. Applicable to existing plants within the constraints of the size of the bag filter.

Table 6: BAT-associated emission levels (BAT-AELs) for channelled emissions to air of HCl, HF and SO_2 from the incineration of waste

Parameter	BAT-AEL mg/Nm³		Averaging period
	New plant	Existing plant	
HCl	< 2 – 6 (1)	< 2 – 8 (1)	Daily average
HF	< 1	< 1	Daily average or average over the sampling period
SO_2	5 – 30	5 – 40	Daily average

(1) The lower end of the BAT-AEL range can be achieved when using a wet scrubber; the higher end of the range may be associated with the use of dry sorbent injection.

Emissions of NO_x, N_2O, CO and NH_3

BAT 29 In order to reduce channelled NO_x emissions to air while limiting the emissions of CO and N_2O from the incineration of waste and the emissions of NH_3 from the use of SNCR and/or SCR, BAT is to use an appropriate combination of the techniques described under BAT 29 in the table below.

Table 7: Techniques to reduce channelled emissions to air of NO_x and CO from the incineration of waste and NH_3 emissions to air from the use of SNCR and/or SCR

	Technique	Description	Applicability
a.	Optimisation of the incineration process		Generally applicable.
b.	Flue-gas recirculation		For existing plants, the applicability may be limited due to technical constraints (e.g. pollutant load in the flue-gas, incineration conditions).
c.	Selective non-catalytic reduction (SNCR)		Generally applicable.
d.	Selective catalytic reduction (SCR)		In the case of existing plants, the applicability may be limited by a lack of space.
e.	Catalytic filter bags		Only applicable to plants fitted with a bag filter.
f.	Optimisation of the SNCR/SCR design and operation	Optimisation of the reagent to NO_x ratio over the cross-section of the furnace or duct, of the size of the reagent drops and of the temperature window in which the reagent is injected.	Only applicable where SNCR and/or SCR is used for the reduction of NO_x emissions.
g.	Wet scrubber	Where a wet scrubber is used for acid gas abatement, and in particular with SNCR, unreacted ammonia is absorbed by the scrubbing liquor and, once stripped, can be recycled as SNCR or SCR reagent.	There may be applicability restrictions due to low water availability, e.g. in arid areas.

Table 8: BAT-associated emission levels (BAT-AELs) for channelled NO_x and CO emissions to air from the incineration of waste and for channelled NH_3 emissions to air from the use of SNCR and/or SCR

Parameter	BAT-AEL mg/Nm³		Averaging period
	New plant	Existing plant	
NO_x	50 – 120 (1)	50 – 150 (1) (2)	Daily average
CO	10 – 50	10 – 50	
NH_3	2 – 10 (1)	2 – 10 (1) (3)	

(1) The lower end of the BAT-AEL range can be achieved when using SCR. The lower end of the BAT-AEL range may not be achievable when incinerating waste with a high nitrogen content (e.g. residues from the production of organic nitrogen compounds).
(2) The higher end of the BAT-AEL range is 180 mg/Nm³ where SCR is not applicable.
(3) For existing plants fitted with SNCR without wet abatement techniques, the higher end of the BAT-AEL range is 15 mg/Nm³.

Emissions of organic compounds

BAT 30 In order to reduce channelled emissions to air of organic compounds including PCDD/F and PCBs from the incineration of waste, BAT is to use techniques (a), (b), (c), (d), and one or a combination of techniques (e) to (i) described under BAT 30 in the table below.

Table 9: Techniques to reduce channelled emissions to air of TVOC, PCDD/F and dioxin-like PCBs from the incineration of waste

	Technique	Description	Applicability
a.	Optimisation of the incineration process	Optimisation of incineration parameters to promote the oxidation of organic compounds including PCDD/F and PCBs present in the waste, and to prevent their and their precursors' (re)formation.	Generally applicable.
b.	Control of the waste feed	Knowledge and control of the combustion characteristics of the waste being fed into the furnace, to ensure optimal and, as far as possible, homogeneous and stable incineration conditions.	Not applicable to clinical waste or to municipal solid waste.
c.	On-line and off-line boiler cleaning	Efficient cleaning of the boiler bundles to reduce the dust residence time and accumulation in the boiler, thus reducing PCDD/F formation in the boiler. A combination of on-line and off-line boiler cleaning techniques is used.	Generally applicable.
d.	Rapid flue-gas cooling	Rapid cooling of the flue-gas from temperatures above 400 °C to below 250 °C before dust abatement to prevent the de novo synthesis of PCDD/F.	
e.	Dry sorbent injection	Adsorption by injection of activated carbon or other reagents, generally combined with a bag filter where a reaction layer is created in the filter cake and the solids generated are removed.	Generally applicable.
f.	Fixed- or moving-bed adsorption		The applicability may be limited by the overall pressure drop associated with the FGC system. In the case of existing plants, the applicability may be limited by a lack of space.
g.	SCR	Where SCR is used for NO_x abatement, the adequate catalyst surface of the SCR system also provides for the partial reduction of the emissions of PCDD/F and PCBs. The technique is generally used in combination with technique (e), (f) or (i).	In the case of existing plants, the applicability may be limited by a lack of space.
h.	Catalytic filter bags		Only applicable to plants fitted with a bag filter.
i.	Carbon sorbent in a wet scrubber	PCDD/F and PCBs are adsorbed by carbon sorbent added to the wet scrubber, either in the scrubbing liquor or in the form of impregnated packing elements. The technique is used for the removal of PCDD/F in general, and also to prevent and/or reduce the re-emission of PCDD/F accumulated in the scrubber (the so-called memory effect) occurring especially during shutdown and start-up periods.	Only applicable to plants fitted with a wet scrubber.

Table 10: BAT-associated emission levels (BAT-AELs) for channelled emissions to air of TVOC, PCDD/F and dioxin-like PCBs from the incineration of waste

Parameter	Unit	BAT-AEL mg/Nm³		Averaging period
		New plant	Existing plant	
TVOC	mg/Nm³	< 3 – 10	< 3 – 10	Daily average
PCDD/F (1)	ng I-TEQ/Nm³	< 0.01 – 0.04	< 0.01 – 0.06	Average over the sampling period
		< 0.01 – 0.06	< 0.01 – 0.08	Long-term sampling period (2)
PCDD/F + dioxin-like PCBs (1)	ng WHO-TEQ/Nm³	< 0.01 – 0.06	< 0.01 – 0.08	Average over the sampling period
		< 0.01 – 0.08	< 0.01 – 0.1	Long-term sampling period (2)

(1) Either the BAT-AEL for PCDD/F or the BAT-AEL for PCDD/F + dioxin-like PCBs applies.
(2) The BAT-AEL does not apply if the emission levels are proven to be sufficiently stable.

Emissions of mercury

BAT 31 In order to reduce channelled mercury emissions to air (including mercury emission peaks) from the incineration of waste, BAT is to use one or a combination of the techniques described under BAT 31 in the table below.

Table 11: Techniques to reduce channelled emissions to air of mercury emissions from the incineration of waste

	Technique	Description	Applicability
a.	Wet scrubber (low pH)	A wet scrubber operated at a pH value around 1. The mercury removal rate of the technique can be enhanced by adding reagents and/or adsorbents to the scrubbing liquor, e.g.: • oxidants such as hydrogen peroxide to transform elemental mercury to a water-soluble oxidised form; • sulphur compounds to form stable complexes or salts with mercury; • carbon sorbent to adsorb mercury, including elemental mercury. When designed for a sufficiently high buffer capacity for mercury capture, the technique effectively prevents the occurrence of mercury emission peaks.	There may be applicability restrictions due to low water availability, e.g. in arid areas.
b.	Dry sorbent injection	Adsorption by injection of activated carbon or other reagents, generally combined with a bag filter where a reaction layer is created in the filter cake and the solids generated are removed.	Generally applicable.
c.	Injection of special, highly reactive activated carbon	Injection of highly reactive activated carbon doped with sulphur or other reagents to enhance the reactivity with mercury. Usually, the injection of this special activated carbon is not continuous but only takes place when a mercury peak is detected. For this purpose, the technique can be used in combination with the continuous monitoring of mercury in the raw flue-gas.	May not be applicable to plants dedicated to the incineration of sewage sludge.
d.	Boiler bromine addition	Bromide added to the waste or injected into the furnace is converted at high temperatures to elemental bromine, which oxidises elemental mercury to the water-soluble and highly adsorbable $HgBr_2$. The technique is used in combination with a downstream abatement technique such as a wet scrubber or an activated carbon injection system. Usually, the injection of bromide is not continuous but only takes place when a mercury peak is detected. For this purpose, the technique can be used in combination with the continuous monitoring of mercury in the raw flue-gas.	Generally applicable.
e.	Fixed- or moving-bed adsorption	When designed for a sufficiently high adsorption capacity, the technique effectively prevents the occurrence of mercury emission peaks.	The applicability may be limited by the overall pressure drop associated with the FGC system. In the case of existing plants, the applicability may be limited by a lack of space.

Table 12: BAT-associated emission levels (BAT-AELs) for channelled mercury emissions to air from the incineration of waste

Parameter	BAT-AEL µg/Nm³		Averaging period
	New plant	Existing plant	
Hg	< 5–20 (2)	< 5–20 (2)	Daily average or average over the sampling period
	1–10	1–10	Long-term sampling period

(1) Either the BAT-AEL for daily average or average over the sampling period or the BAT-AEL for long-term sampling period applies. The BAT-AEL for long-term sampling may apply in the case of plants incinerating waste with a proven low and stable mercury content (e.g. mono-streams of waste of a controlled composition).

(2) The lower end of the BAT-AEL ranges may be achieved when:

- incinerating wastes with a proven low and stable mercury content (e.g. mono-streams of waste of a controlled composition), or
- using specific techniques to prevent or reduce the occurrence of mercury peak emissions while incinerating non-hazardous waste.

The higher end of the BAT-AEL ranges may be associated with the use of dry sorbent injection.

As an indication, the half-hourly average mercury emission levels will generally be:

- < 15 to 40 µg/Nm³ for existing plants;
- < 15 to 35 µg/Nm³ for new plants.

Emissions to water

BAT 32 In order to prevent the contamination of uncontaminated water, to reduce emissions to water, and to increase resource efficiency, BAT is to segregate waste water streams and to treat them separately, depending on their characteristics.

Description

Waste water streams (e.g. surface run-off water, cooling water, waste water from flue-gas treatment and from bottom ash treatment, drainage water collected from the waste reception, handling and storage areas (see BAT 12 (a)) are segregated to be treated separately based on their characteristics and on the combination of treatment techniques required. Uncontaminated water streams are segregated from waste water streams that require treatment.

When recovering hydrochloric acid and/or gypsum from the scrubber's effluent, the waste waters arising from the different stages (acidic and alkaline) of the wet scrubbing system are treated separately.

Applicability

Generally applicable to new plants.

Applicable to existing plants within the constraints associated with the configuration of the water collection system.

BAT 33 In order to reduce water usage and to prevent or reduce the generation of waste water from the incineration plant, BAT is to use one or a combination of the techniques described under BAT 33 in the table below.

Table 13: Techniques to reduce water usage and to prevent or reduce the generation of waste water from the incineration plant

	Technique	Description	Applicability
a.	Waste-water-free FGC techniques	Use of FGC (Flue Gas Cleaning) techniques that do not generate waste water (e.g. dry sorbent injection or semi-wet absorber).	May not be applicable to the incineration of hazardous waste with a high halogen content.
b.	Injection of waste water from FGC	Waste water from FGC is injected into the hotter parts of the FGC system.	Only applicable to the incineration of municipal solid waste.
c.	Water reuse/recycling	Residual aqueous streams are reused or recycled. The degree of reuse/recycling is limited by the quality requirements of the process to which the water is directed.	Generally applicable.

Table 14: BAT-AELs for direct emissions to a receiving water body

Parameter		Process	Unit	BAT-AEL (1)
Total suspended solids (TSS)		FGC	mg/l	10–30
Total organic carbon (TOC)		FGC		15–40
	As	FGC		0.01–0.05
	Cd	FGC		0.005–0.03
	Cr	FGC		0.01–0.1
	Cu	FGC		0.03–0.15
	Hg	FGC		0.001–0.01
	Ni	FGC		0.03–0.15
	Pb	FGC		0.02–0.06
	Sb	FGC		0.02–0.9
	Tl	FGC		0.005–0.03
	Zn	FGC		0.01–0.5
PCDD/F		FGC	ng I-TEQ/l	0.01–0.05

(1) The averaging periods are defined in the General considerations.

Table 15: BAT-AELs for indirect emissions to a receiving water body

Parameter		Process	Unit	BAT-AEL (1) (2)
Metals and metalloids	As	FGC	mg/l	0.01–0.05
	Cd	FGC		0.005–0.03
	Cr	FGC		0.01–0.1
	Cu	FGC		0.03–0.15
	Hg	FGC		0.001–0.01
	Ni	FGC		0.03–0.15
	Pb	FGC		0.02–0.06
	Sb	FGC		0.02–0.9
	Tl	FGC		0.005–0.03
	Zn	FGC		0.01–0.5
PCDD/F		FGC	ng I-TEQ/l	0.01–0.05

(1) The averaging periods are defined in the General considerations.
(2) The BAT-AELs may not apply if the downstream waste water treatment plant is designed and equipped appropriately to abate the pollutants concerned, provided this does not lead to a higher level of pollution in the environment.

3. Outlook

After this long time of discussion, it is anticipated that the review of the BREF WI will have a certain impact on new and existing waste incineration plants in Europe. Taking the discussion of general air pollution control strategies in mind, additional measures in terms of monitored parameters and thereby applicable measuring methods should not be ruled out.

An important task for the respective Member States results from the fact that, from the publication of Chapter 5 in the European Official Journal, a 4-year period has elapsed in which the requirements must be implemented at national level.

Based on the experience with other BREF's, it can be assumed that an appropriate publication will take place at the latest in November of this year.

4. Sources

[1] Directive 2010/75/EU of the European Parliament and of the Council of 24 November 2010 on industrial emissions (integrated pollution prevention and control) (Recast) (ABl. L 334, 17.12.2010)

[2] Verordnung zur Umsetzung der Richtlinie über Industrieemissionen, zur Änderung der Verordnung zur Begrenzung der Emissionen flüchtiger organischer Verbindungen beim Umfüllen oder Lagern von Ottokraftstoffen, Kraftstoffgemischen oder Rohbenzin sowie zur Änderung der Verordnung zur Begrenzung der Kohlenwasserstoffemissionen bei der Betankung von Kraftfahrzeugen (Bundesgesetzblatt Teil I, 2013, Nr. 21, S. 1021)

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