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REVIEW OF THE BEST AVAILABLE TECHNIQUES (BAT) REFERENCE DOCUMENT FOR COMMON WASTE WATER AND WASTE GAS TREATMENT/MANAGEMENT SYSTEMS IN THE CHEMICAL SECTOR (CWW BREF)

Assessment of split view rationales

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1 INTRODUCTION

1.1 General aspects

According to Commission Implementing Decision 2012/119/EU (see Section 4.6.2.3, page 27), the following provisions apply to dissenting views expressed at final TWG meetings:

'*4.6.2.3. Final TWG meeting*

4.6.2.3.1. General

The final TWG meeting aims at resolving outstanding issues with a view to conclude the technical discussions within the TWG.

…

In the final TWG meeting, the objective is to reach conclusions by consensus of the TWG members present. When there are well founded dissenting views, these will be recorded as indicated in Section 4.6.2.3.2 below.

4.6.2.3.2. Split views

BAT as well as environmental performance levels (see Section 3.3) associated with BAT will be drafted by the EIPPCB on the basis of information available at the time of distributing the draft to the TWG for its final meeting (see Section 4.6.2.3). Such information may include any specific proposals for BAT or associated environmental performance levels received from the TWG.

TWG members are expected to provide sound technical, cross-media and economic arguments as relevant to their case when they do not agree with the draft BAT conclusions. Such arguments should be submitted initially as comments to the formal draft BREF within the consultation period set (see Section 1.2.4).

If the TWG in the end reaches no consensus on an issue, the dissenting views and their rationale will be reported in the 'Concluding remarks and recommendations for future work' section of the BREF only if both the following conditions are fulfilled:

1. the dissenting view is based on information already made available to the EIPPCB at the time of drafting the conclusions on BAT for the BREF or has been provided within the commenting period corresponding to such a draft;

2. a valid rationale supporting the split view is provided by the TWG member(s) concerned. The EIPPCB will consider a rationale to be valid if it is supported by appropriate technical, cross-media or economic data or information relevant to the definition of BAT.

The Member States, environmental NGOs or industry associations that bring or support the split view will be explicitly named in the document (see Section 2.3.10).'

1.2 Overview of split views expressed at the final TWG meeting for the review of the CWW BREF

The final TWG meeting held from 10 – 13 December 2013 in Seville achieved a high degree of consensus. Nevertheless, split views on eight different topics were recorded:

No.	Meeting conclusions' slide no.	Topic	Split view from	Section in this document
1	32	Absence of BAT-AELs for emissions to water after pretreatment	Austria	2
2	50	Absence of short-term BAT-AELs for emissions to water after final treatment	Austria	3
3	60	BAT-AEL for emissions of TSS to water	Austria	4.2
			Spain	4.3
			United Kingdom	4.4
			CEFIC	4.5
4	64	BAT-AEL for emissions of TN and/or N_{inorg} to water	Austria	5.2
			United Kingdom	6
			CEFIC	5.3 and 6
5	69	BAT-AEL for emissions of total phosphorous to water	United Kingdom, CEFIC	6
6	76	BAT-AEL for emissions of zinc to water	Germany, CEFIC	7
7	99	Absence of BAT-AELs for emissions to air	Austria, Denmark, Germany, the Netherlands	8
8	115	BAT on monitoring of diffuse VOC emissions	CEFIC	9

The summaries of the rationales for each of the split views are reported in the following pages together with the EIPPCB's assessment. The content of individual split views on the same topic may differ from one to another. In this document, some split views are grouped together when the proposal and the rationale are similar and when the split views refer to each other.

Additional 'split views' were submitted by the EEB after the final TWG meeting without having attended it. Given that the last paragraph of Section 4.6.2.3.1 (under '*4.6.2.3 Final TWG meeting*') of Commission Implementing Decision 2012/119/EU stipulates that:

'*In the final TWG meeting, the objective is to reach conclusions by consensus of the* ***TWG members present. When there are well founded dissenting views****, these will be recorded as indicated in Section 4.6.2.3.2 below.*'

these views are not addressed in this document.

2 ABSENCE OF BAT-AELS FOR EMISSIONS TO WATER AFTER PRETREATMENT

Conclusion of the meeting
Slide 31: '*Do not add any performance level to the BAT on pretreatment*.'

Split view summary
Austria proposes to add BAT-AELs to the reformulated BAT 11 on waste water pretreatment. These proposed BAT-AELs would cover inhibitory/toxic compounds, compounds that are insufficiently abated during final treatment, compounds that are otherwise stripped to air and compounds that have other negative effects.

The split view is accompanied by the following rationale:

- Waste water pretreatment is both within the scopes of the CWW BREF and the other chemical BREFs.
- If no BAT-AELs for waste water pretreatment are set in the CWW BREF, there may be regulatory gaps.
- BAT-AELs after pretreatment are particularly important when the pretreated waste water is discharged to an urban waste water treatment plant.
- Achievable performance and emission levels of numerous waste water pretreatment techniques were included in the BAT chapter of the original CWW BREF (February 2003).

EIPPCB assessment

- For a pretreatment that does not involve an emission from the installation there is no possibility to set BAT-AELs in the sense of Article 3(13) of the Industrial Emissions Directive 2010/75/EU (IED). However, they could be classified as BAT-associated environmental performance levels (BAT-AEPLs).
- The BAT chapter of the original CWW BREF (February 2003) contains several tables with waste water pretreatment techniques, e.g. for the removal of suspended solids (Table 4.3), heavy metals (Table 4.4), inorganic salts other than heavy metals (Table 4.5) and contaminants that are unsuitable for biological treatment (Table 4.6). For some of the techniques, '*achievable emission levels*' are given. The introduction to the BAT chapter of the original CWW BREF clarifies that the term '*achievable level*' is to be distinguished from the term '*levels associated with BAT*' (see Section 4.1, page 271).
- The Commission Implementing Decision 2012/119/EU stipulates in Section 3.3 on page 20: '*An environmental performance level associated with BAT will be included where there is a **sound basis** for doing so. This will be done based on the information exchanged by the TWG **taking into account the quantity and quality of the plant-specific data** received during the exchange of information.*'
- Despite a targeted second data collection at the end of 2012, very few plant-specific data on the performance of waste water pretreatment techniques were received.
- The TWG concluded to add a recommendation in the Chapter on '*Concluding remarks and recommendations for future work*' that further performance data on pretreatment techniques should be gathered during the next review of the CWW BREF and/or as part of the review of the other chemical BREFs in order to assess the possibility of setting BAT-associated environmental performance levels.

EIPPCB conclusion
Taking these aspects into account, the EIPPCB considers that the split view is not supported by appropriate technical arguments. In particular, no evidence of the existence of plant-specific data is given on which basis BAT-AELs or BAT-AEPLs, could be derived. This split

view will therefore not be reported in the '*Concluding remarks and recommendations for future work*' section of the BREF.

3 ABSENCE OF SHORT-TERM BAT-AELS FOR EMISSIONS TO WATER AFTER FINAL TREATMENT

Conclusion of the meeting
Slide 49: '*Do not set short-term BAT-AELs for emissions to water*.'

Split view summary
Austria proposes to express the BAT-AELs for emissions to water after final treatment on a short-term basis (as daily averages) or to add them to those BAT-AELs already expressed as yearly averages.

The split view is accompanied by the following rationale:

- Only short-term BAT-AELs for emissions to water will make monitoring and compliance control feasible.
- BAT-AELs for emissions to air are generally expressed as short-term averages (daily for continuous monitoring or at least half-hourly for periodic monitoring). The same should apply for emissions to water.
- Emission limit values (ELVs) are usually set on a short-term basis. If BAT-AELs are only given as yearly averages, many Member States have to transform them into short-term ELVs. This will lead to an unequal implementation of the BAT conclusions and an uneven playing field.
- If BAT-AELs are only expressed as yearly averages, the administrative burden will increase for operators to prove compliance with ELVs and for authorities to assess this.
- Compliance with ELVs based on a yearly average can only be assessed retroactively. There will be no prompt information if ELVs are exceeded and therefore less protection of human health and the environment.
- If BAT-AELs are only set on a yearly basis, the public will only be informed about yearly average emission values. No information on fluctuations and peak emissions will be available.
- Short-term BAT-AELs for emissions to water can be found in the adopted BAT conclusions for the production of glass as well as iron and steel.
- The submitted data are likely to comprise daily average values, too.
- The European IPPC Bureau (EIPPCB) should have tried harder to gather more short-term data and should have taken a clearer stance that this is not a matter of negotiations but an important part of the information exchange exercise.

EIPPCB assessment

- The IED stipulates in Article 13 (2) (a):

  '*2. The exchange of information shall, in particular, address the following:*

  (a) the performance of installations and techniques in terms of emissions, expressed as short- and long-term averages, where appropriate, and the associated reference conditions, consumption and nature of raw materials, water consumption, use of energy and generation of waste; ...'

- The Commission Implementing Decision 2012/119/EU stipulates:

  Section 3.3, page 20:
  '*An environmental performance level associated with BAT will be included where there is a* ***sound basis*** *for doing so. This will be done based on the information*

exchanged by the TWG ***taking into account the quantity and quality of the plant-specific data*** *received during the exchange of information.*'

Section 3.3.1, page 20:
'*... If considered necessary, and* ***if the data submitted allows for doing so****, BAT-AELs may be expressed as short-term and long-term averages (see also Section 5.4.7).* '

Section 4.4.2, page 23:
'*...* ***The TWG is the main source of information*** *for the drawing up and reviewing of a BREF. It is therefore essential that the TWG members are active in the exchange of information. By joining the TWG, the members commit to actively collecting and delivering information by the deadlines agreed by the TWG or proposed by the EIPPCB, while respecting competition rules. ...*'

- In general, only yearly averages, minimum and maximum values were received during the information exchange. There is uncertainty if the provided minimum and maximum values also include other than normal operating conditions. The reported maximum values seem to refer to heterogeneous reference conditions as described in the analysis of the questionnaires from 26 November 2010 (see Section 2.1, page 13). Some maximum values are expressed as 90 percentiles, some as 80 percentiles, some values are reported with outliers removed while others are not, some values are reported as highest monthly averages etc.
- The sampling regime is sometimes unclear. If reported, it frequently refers to either 24-h-composite samples or to spot samples. Using only the data referring to 24-h composite samples would significantly reduce the data basis for deriving BAT-AELs.
- Fluctuations around the yearly average sometimes vary widely from one installation to another (e.g. for COD from approximately 2 to more than 10).
- The aforementioned problems with setting short-term BAT-AELs based on maximum concentrations can be avoided by setting BAT-AELs based on yearly average concentrations.
- At the third TWG subgroup meeting held in Seville in April 2012, Germany and CEFIC volunteered to form another subgroup with other interested Member States to explore whether appropriate short-term BAT-AELs could be derived from the available long-term data. However, this group never provided input to the information exchange process despite several reminders sent by the EIPPCB on 5/06/2012, 30/01/2013, and 8/03/2013. No other TWG members provided any input.
- During the two surveys launched by the EIPPCB, data from 99 installations directly discharging to a receiving water body were collected. In the case of Austria, one questionnaire was submitted. This questionnaire only contained annual average emission concentrations, but no minimum and maximum values.
- The absence of short-term BAT-AELs in the BAT conclusions does not preclude competent authorities from setting short-term emission limit values in IED permits
- The TWG concluded to add a recommendation in the Chapter on '*Concluding remarks and recommendations for future work*' that short-term emission data should be gathered during the next review of the CWW BREF in order to assess the possibility of setting short-term BAT-AELs.

EIPPCB conclusion

Taking these aspects into account, the EIPPCB considers that the split view is not supported by appropriate technical arguments. In particular, no evidence is provided that the collected data provide a sound basis for deriving short-term BAT-AELs. This split view will therefore not be reported in the '*Concluding remarks and recommendations for future work*' section of the BREF.

4 BAT-AEL FOR EMISSIONS OF TOTAL SUSPENDED SOLIDS (TSS) TO WATER

4.1 Overview

Conclusion of the meeting
Slide 61 on Table 4.1:

Parameter	*BAT-AEL (yearly average)*	*Conditions*
Total suspended solids (TSS)	*5 – 35 mg/l ([7]) ([8])*	*The BAT-AEL applies if the emission exceeds 3.5 t/yr.*
([7]) The lower end of the range is typically achieved when using filtration (e.g. sand filtration, microfiltration, ultrafiltration, membrane bioreactor), while the upper end of the range is typically achieved when using sedimentation only. *([8]) This BAT-AEL may neither apply when the main pollutant load originates from the production of soda ash via the Solvay process nor when it originates from the production of titanium dioxide.*		

A total of four split views on the BAT-AEL for emissions of TSS to water were expressed. Given that the proposals and their rationales vary to some extent from one to another, they are presented separately here.

4.2 Split view from Austria

Split view summary
Austria proposes to increase the upper end of the BAT-AEL range in cases where sedimentation technology is applied.

The split view is accompanied by the following rationale:

- In BAT 12 on final waste water treatment techniques, even sedimentation is regarded to be BAT.
- The footnote 7 in Table 4.1 recognises that the upper end of the BAT-AEL range (i.e. 35 mg/l) is typically achieved when using sedimentation only.
- The settlement properties of activated sludge can show big variations depending on the quality of the raw waste water and the specific plant design. In industrial waste water treatment plants, the settlement properties are usually worse than in municipal waste water treatment plants.
- Installation #70 from the surveys produces pharmaceuticals and is equipped with two final clarifier basins operated in series. It shows a yearly average TSS concentration of approximately 48 mg/l.

EIPPCB assessment

- The BAT-AELs in Table 4.1 are associated to BAT 10 on the integrated waste water management and treatment strategy where the BAT statement refers to an '***appropriate combination*** *of the techniques given below*'. BAT 12 also refers to the use of '*an* ***appropriate combination*** *of final waste water treatment techniques*'. From this it can be concluded that the sole use of one technique such as sedimentation may not always be sufficient to achieve the BAT-AELs.
- The footnote 7 to the BAT-AEL on emissions of TSS to water stipulates that the upper end of the range is typically achieved when using sedimentation only. The term '*typically*' implies that the use of sedimentation only may not in all cases be sufficient to achieve emission levels within the BAT-AEL range.

- The performance of a technique does not only depend on the technology, but also on the way it is designed, maintained and operated. BAT-AELs are set on the basis of the performance of well designed, maintained, and operated installations.
- The BAT-AEL for TSS was derived on the basis of data from industrial waste water treatment plants from the chemical sector.
- Although installation #70 reported the use of two clarifiers in the surveys, the fact that they are operated in series was not mentioned.
- Two other installations in the surveys that produce organic fine chemicals (i.e. #75 (DK) and #118 (FR)) show TSS values in the effluents that are well below the upper end of the BAT-AEL range although they are much smaller and they show similar or even higher concentrations of BOD_5 in the influent to the final waste water treatment plant. These two installations also show lower BOD_5 values in the effluents.

Installation	MS	Year	Treated waste water volume	Influent (yearly average)		Effluent (yearly average)	
				BOD_5		BOD_5	TSS
			in 10^6 m^3/yr	in g/l	in 10^3 t/yr	in mg/l	in mg/l
#70	AT	2011	2.8	4.5	13.3	22	48
#75	DK	2011	0.16	3.9	0.67	7	10
#118	FR	2011	0.33	6.8	2.4	2.8	2

EIPPCB conclusion
Taking these aspects into account, the EIPPCB considers that the split view is not supported by appropriate technical arguments. This split view will therefore not be reported in the '*Concluding remarks and recommendations for future work*' section of the BREF.

4.3 Split view from Spain

Split view summary
Spain proposes that the BAT-AEL for emissions of TSS to water should not apply to plants discharging to the sea via submarine outfalls.

The split view is accompanied by the following rationale:
- The impact of TSS emissions largely depends on the quality of the receiving environment. Discharges of TSS to rivers show a far higher environmental impact than discharges to the sea.
- For many installations located close to the sea, the best environmental solution for aqueous discharges is the construction of an outfall that ensures an adequate dispersion of the contaminant. This is particularly the case for substances/parameters that are considered non-hazardous such as TSS.
- Permits based on impact assessments and appropriate follow-up monitoring ensure that there is no significant impact on the receiving environment.
- Important investments for such sea outfalls were made in the past. Significant costs are also incurred during maintenance and operation. These investments would become obsolete if plants were to implement more stringent TSS removal techniques.
- The installations #37, #47, and #48 from the surveys are located in Spain and discharge to the sea. They show higher TSS emission values than the upper end of the BAT-AEL range.

EIPPCB assessment

- It is not always the case that discharges to the sea have a lower impact on the receiving environment than discharges to rivers and lakes.
- No supporting information was provided demonstrating that, in the case of TSS, sea outfalls via large pipes are the best solution for the environment.
- Materials in suspension are included in the list of polluting substances in Annex II to the IED. It cannot be generally assumed that emissions of TSS are unproblematic.
- For each parameter/pollutant, the impact of the emission depends on the quality and quantity of the waste water as well as on the sensitivity of the receiving environment. This is neither a specific issue for the parameter TSS nor a specific issue for the CWW BREF.
- BAT-AEL exemptions depending on the sensitivity of the receiving water body were neither included in previously adopted BAT conclusions, nor in the existing BREF series.
- The IED gives a general preference to pollution prevention in Article 1:

  '*This Directive lays down rules on integrated* ***prevention*** *and control of pollution arising from industrial activities.*

  It also lays down rules designed ***to prevent or, where that is not practicable, to reduce*** *emissions into air, water and land and to prevent the generation of waste, in order to achieve a high level of protection of the environment taken as a whole.*'

- The IED already contains provisions for potential derogations from BAT-AELs due to the geographical location or the local environmental conditions (Article 15 (4)):

  '*By way of derogation from paragraph 3, and without prejudice to Article 18, the competent authority may, in specific cases, set less strict emission limit values. Such a derogation may apply only where an assessment shows that the achievement of emission levels associated with the best available techniques as described in BAT conclusions would lead to* ***disproportionately higher costs compared to the environmental benefits*** *due to:*

  (a) ***the geographical location or the local environmental conditions*** *of the installation concerned; or*
  (b) ***the technical characteristics*** *of the installation concerned. ...*'

- The IED also contains provisions when environmental quality standards require stricter conditions (Article 18):

  '*Where an environmental quality standard requires stricter conditions than those achievable by the use of the best available techniques, additional measures shall be included in the permit, without prejudice to other measures which may be taken to comply with environmental quality standards.*'

- No technical rationale is given why the installations #37, #47, and #48 could not achieve emission levels within the agreed BAT-AEL range (i.e. information about the techniques used).
- In the case of installation #37, a BOD_5 concentration of 141 mg/l and a COD concentration of 703 mg/l were reported for the effluent in 2011. The COD removal efficiency during final treatment amounted to approximately 61 %. These data suggest that the performance of the final biological treatment could be improved.

- Some of the installations in the surveys discharging to the sea reported yearly average TSS emission levels within the agreed BAT-AEL range, e.g. #33 (UK), #34 (SE), #79 (ES), #89 (IT), #90 (IT).

EIPPCB conclusion
Taking these aspects into account, the EIPPCB considers that the split view is not supported by appropriate technical arguments. Furthermore, this split view is considered to be related to implementation issues, which are considered to go beyond the mandate of the TWG. This split view will therefore not be reported in the '*Concluding remarks and recommendations for future work*' section of the BREF.

4.4 Split view from the United Kingdom

Split view summary
The United Kingdom proposes to:

1. add a footnote that exempts or sets a higher upper end of the BAT-AEL range for installations with a high recalcitrant TOC/COD load in the waste water;
2. formulate the footnote 8 exempting the production of soda ash and titanium dioxide in a more generic way based on the characteristics of the waste water.

The split view is accompanied by the following rationale:

- Exemptions to BAT-AEL ranges should generally be based on the characteristics of the waste water and not on specific production activities. This ensures that specific production activities which were not covered by the surveys are not penalised. For example for soda ash and titanium dioxide, the main problems associated with the TSS are the fine particle size and slow settling rates.
- In the case of installations with a high recalcitrant TOC/COD load in the waste water, even an optimised biological treatment will lead to higher TOC/COD concentrations in the effluent and an associated higher TSS concentration.
- Referring to specific production processes such as the Solvay process may impede innovation. If another process was developed that showed lower TSS emissions than the Solvay process, but higher than the upper end of the BAT-AEL range, then this alternative process would be disadvantaged.
- The exclusion of the Solvay process, as currently written, may be understood as referring to the original Solvay process that is not anymore in use.
- It seems premature to set unachievable limits for certain well-managed sites on the basis of information extracted from significantly different processes.

EIPPCB assessment

- The TSS concentration in the final effluent depends primarily on the performance of the techniques used for the final solids removal. Therefore, a high concentration of recalcitrant TOC/COD does not necessarily correlate with a high TSS concentration.
- When referring to the '*Solvay process*', the process variants that are currently in use are typically included (see for example the LVIC-S BREF (August 2007)).
- Concerning the exemption of specific types of production activities, it seems indeed preferable to formulate the footnotes in a more generic way based on the characteristics of the process or of the waste water. This approach was partly followed for the BAT-AELs for TOC/COD (high proportion of refractory organic compounds) and metals (inorganic effluents from the production of inorganic heavy metal compounds; processing of large volumes of solid inorganic compounds that are contaminated with metals). However, in the case of TSS very limited information on this issue was provided during the review process. The two criteria mentioned in the

rationale accompanying the split view (i.e. fine particle size and slow settling rates) may not be sufficient. In the case of soda ash and titanium dioxide, the high load of suspended solids also seems to be an important factor.

- In the existing series of chemical BREFs, the generic BAT-AEL for emissions of TSS to water is given in the CWW BREF (February 2003) and is expressed in concentration. A few processes are mentioned with an additional BAT-AEL **expressed in specific loads**:

  LVIC-S BREF (August 2007): soda ash via the Solvay process: TSS: 90 – 240 kg/t;
  LVIC-S BREF (August 2007): titanium dioxide via: 1) the chloride route: TSS: 0.5 – 2.5 kg/t, 2) the sulphate route: TSS: 1 – 40 kg/t;
  POL BREF (August 2007): GPPS/HIPS and PVC: TSS: 0.010 kg/t.

  Therefore, it seems as if the agreed footnote 8 on soda ash and titanium dioxide covers the most important inorganic processes that may lead to high concentrations of TSS.
- No information is given on which well-managed sites are not able to achieve the agreed BAT-AEL for TSS and why this is the case.

EIPPCB conclusion
Taking these aspects into account, the EIPPCB considers that some elements of the split view are supported by appropriate technical arguments. This split view will therefore be reported in the '*Concluding remarks and recommendations for future work*' section of the BREF.

A possible formulation of this split view could be: '*The United Kingdom expressed a dissenting view that the footnote on the BAT-AEL for emissions of TSS to water concerning the production of soda ash and titanium dioxide should be formulated in a more generic way, namely: 'This BAT-AEL may not apply to inorganic effluents in the case of high TSS loads and slow settlement rates'*.'

4.5 Split view from CEFIC

Split view summary
CEFIC proposes to increase the upper end of the BAT-AEL range to '*at least 40 mg/l whereas the detailed analysis provided … actually suggests an upper end of 50 mg/l*'.

The split view is accompanied by the following rationale:

- The reported TSS values in the surveys were measured using different analytical techniques and are therefore not comparable. The relevant European standard EN 872 (February 2005) stipulates that the result of the determination depends to some extent on the type of filter that is used. In the case of samples with high salt content, precipitation may occur during sample handling and storage. Data from example plants located in the Netherlands and Germany show significant differences in the analytical result when using EN 872 versus the Dutch standard NEN 6621 or versus a settleability method.
- High fluctuations in the quality of the influent to a biological waste water treatment plant may result in highly variable TSS effluent concentrations during normal operating conditions. An example plant located in France (not covered by the surveys) is only able to achieve yearly average TSS values below 50 mg/l despite using BAT (API settlers, dissolved air flotation, activated sludge process).
- Inorganic stand-alone plants without biological treatment were not sufficiently covered by the surveys. Two example plants located in Germany (not covered by the

surveys) are only able to achieve yearly average TSS values around 40 and 70 mg/l despite using BAT (extended sedimentation in the latter case).

- At sites producing petrochemicals or organic fine chemicals, a high salt content may affect the biological treatment via the activated sludge sedimentation and via the influent organic load capacity, both resulting in elevated TSS concentrations in the effluent.
- High portions of easily degradable substances in the influent to a biological waste water treatment plant lead to instable flocculation structures and unfavourable settling properties. Example plants include those that use fermentation processes and anaerobic treatment, i.e. #14 (DE), #70 (AT), and #108 (UK) from the surveys.

EIPPCB assessment

- All graphs presented in the rationale were submitted less than a week before the final TWG meeting. Therefore, the TWG did not have time to assess these data.
- Only one installation from the Netherlands participated in the surveys (#19). This installation reported the use of EN 872. The use of NEN 6621 was not reported in the surveys. The settleability method used by installation #14 (DE) is not a reference method recognised by the German waste water ordinance where EN 872 is given as the only reference method. No TSS value was reported by installation #14 (DE) in the surveys.
- The use of a variety of analytical methods was reported for all parameters in the surveys, including for TSS. EN 872 stipulates that the result depends to some extent on the type of glass fibre filter used, but similar considerations are valid for other parameters such as TOC, for which the relevant standard EN 1484 allows for the use of different options, or for COD, for which no EN standard is available.
- All BAT-AELs for emissions to water are expressed as yearly averages during normal operating conditions, thereby taking into account normal daily fluctuations. The TSS data from the installation in France were only provided shortly before the final TWG meeting.
- The TSS data from the two inorganic installations in Germany were only provided shortly before the final TWG meeting. In the surveys, however, 12 installations out of a total of 99 with direct discharges were 'inorganic' sites without biological treatment. A number of these installations reported yearly average TSS emission levels within the agreed BAT-AEL range, e.g. #32 (UK), #73 (DE), #79 (ES), #94 (PL), #95 (PL), #105 (UK), #115 (UK), #117 (UK), and #120 (FR).
- The rationale for the influence of the high salt content originates from a book in French. Extracts of this book were not provided during the review process. In particular, the potential influence of high salt concentrations on TSS emission values is not mentioned in Sections 2.3.2.2 '*Total suspended solids (TSS)*' and 3.2.3.4.2.3 '*Sedimentation of solids*' of the revised Draft 2 of the CWW BREF (November 2013). No such comment was provided on the Draft 2.
- The TSS concentration in the final effluent depends primarily on the performance of the techniques used for the final solids removal. Therefore, a high concentration of easily degradable substances does not necessarily correlate with a high TSS concentration.
- TSS data from installations #14 (DE) and #108 (UK) were only provided shortly before or during the final TWG meeting. Therefore, the TWG did not have time to assess these data. On the contrary, TSS emission data from installation #70 were provided during the surveys (annual average of approximately 48 mg/l). However, two other installations in the surveys that produce organic fine chemicals (i.e. #75 (DK) and #118 (FR)) show similar or even higher concentrations of BOD_5 in the influent to the final waste water treatment plant while the TSS values in the effluents are well below the upper end of the BAT-AEL range.

EIPPCB conclusion

Taking these aspects into account, the EIPPCB considers that the split view is almost entirely based on data that were not provided in due time. This split view will therefore not be reported in the '*Concluding remarks and recommendations for future work*' section of the BREF.

5 BAT-AEL FOR EMISSIONS OF TOTAL NITROGEN (TN) AND/OR TOTAL INORGANIC NITROGEN (N_{INORG}) TO WATER

5.1 Overview

Conclusion of the meeting
Slides 65 and 66 on Table 4.1:

Parameter	*BAT-AEL (yearly average)*	*Conditions*
Total nitrogen (TN) ([9])	*5 – 25 mg/l ([10]) ([11])*	*The BAT-AEL applies if the emission exceeds 2.5 t/yr.*
Total inorganic nitrogen (N_{inorg}) ([9])	*5 – 20 mg/l ([10]) ([11])*	*The BAT-AEL applies if the emission exceeds 2 t/yr.*
([9]) Either the BAT-AEL for total nitrogen or the BAT-AEL for total inorganic nitrogen applies. *([10]) The BAT-AEL for TN and N_{inorg} do not apply to installations without biological treatment. The lower end of the range is typically achieved when the influent to the biological waste water treatment plant contains low levels of nitrogen and/or when biological nitrification/denitrification can be operated under optimum conditions.* *([11]) The upper end of the range may be higher and up to 40 mg/l for TN or 35 mg/l for N_{inorg} as a yearly average if the abatement efficiency is ≥ 70 % as a yearly average (including both pretreatment and final treatment). The abatement efficiency is calculated as indicated in the 'GENERAL CONSIDERATIONS' section of these BAT conclusions.*		

A total of three split views on the BAT-AEL for emissions of TN and/or N_{inorg} to water were expressed. Given that the proposals and their rationales vary to some extent, they are not all presented together. The split view of Austria on TN and a part of the split view from CEFIC on N_{inorg} are presented separately in this section. The other part of the split view from CEFIC on TN/N_{inorg} is presented together with the split view of the United Kingdom in Section 6.

5.2 Split view from Austria on the BAT-AEL for total nitrogen (TN)

Split view summary
Austria proposes to increase the upper end of the BAT-AEL range for TN if the main pollutant load in the waste water originates from biological processes such as fermentation processes for the production of active pharmaceutical ingredients.

The split view is accompanied by the following rationale:

- Effluents from waste water treatment plants always contain to a certain extent refractory organic substances (ROS) such as humins which can be considered not anymore biodegradable. ROS may be formed during biodegradation in the waste water treatment plant itself or they may originate from upstream biological processes such as fermentation processes for the production of active pharmaceutical ingredients.
- Installation #70 (AT) from the surveys reported high COD concentrations of about 10 g/l in the influent and a COD abatement efficiency of approximately 94.5 % resulting in COD concentrations in the effluent of approximately 562 mg/l as a yearly average. The high COD concentrations in the influent result from water saving measures and waste water segregation while the high COD values in the effluent result from ROS.

- Under certain conditions, a COD concentration of 300 mg/l or even higher is considered BAT in Table 4.1 as agreed at the final TWG meeting.
- The high residual COD concentration due to ROS results in a high concentration of dissolved organic nitrogen in the effluent.
- Installation #70 (AT) applies BAT by using nitrification/denitrification and is able to achieve the BAT-AEL for N_{inorg} (~26 mg/l), but not the one for TN (~70 mg/l) due to the presence of ROS.

EIPPCB assessment

- Installation #70 (AT) reported very high TN values of approximately 750 mg/l in the influent to the final biological waste water treatment plant and a high abatement efficiency of around 91 % resulting in effluent concentrations of approximately 70 mg/l as a yearly average. The ratio of TN/N_{inorg} in the effluent is approximately 2.6.
- Given that data for the concentration of N_{inorg} in the influent were not submitted, it is not possible to calculate the share of the organic nitrogen compounds in the influent to the biological waste water treatment plant.
- The argument that the high TN values originate from the formation of ROS was not submitted before the final TWG meeting. High TN values in the influent could also result from the presence of poorly biodegradable organic nitrogen compounds, which might be the case for some pharmaceuticals. These would therefore require appropriate pretreatment.
- The agreed Table 4.1 stipulates that either the BAT-AEL for TN or N_{inorg} applies.
- The ratio of TN/N_{inorg} in the final effluent is site-specific, but usually close to 1. In a German study carried out in the 1990s (available in BATIS), the median in the chemical industry accounted for 1.21 which is roughly in line with the ratio of the agreed upper ends of the BAT-AEL ranges: 40 / 35 = 1.14. Nevertheless, in specific cases with high loads of organic nitrogen compounds, the ratio may be higher.

EIPPCB conclusion

Taking these aspects into account, the EIPPCB considers that the split view is supported by appropriate technical arguments. This split view will therefore be reported in the '*Concluding remarks and recommendations for future work*' section of the BREF.

A possible formulation of this split view could be: '*Austria expressed a dissenting view that the BAT-associated emission level (BAT-AEL) for emissions of total nitrogen (TN) to water may not apply when the main pollutant load originates from biological processes (e.g. fermentation processes for the production of active pharmaceutical ingredients).*'

5.3 Split view from CEFIC on the BAT-AEL for total inorganic nitrogen (N_{inorg})

Split view summary

CEFIC proposes to add a footnote to the BAT-AEL for N_{inorg} stipulating that the BAT-AEL may not apply when the main pollutant load originates from the production of soda ash via the Solvay process.

The split view is accompanied by the following rationale:

- Due to its mineral composition and the high chloride content, the waste water from the production of soda ash via the Solvay process is not suitable for biological treatment.
- The BAT-AEL for TSS contains an exemption for the production of soda ash via the Solvay process.

- Conflicting conclusions between the CWW BREF and the other chemical BREFs should be avoided. More specific conclusions should prevail over more generic ones (*lex generalis* versus *lex specialis*).
- The LVIC-S BREF (August 2007) stipulates in Section 2.5, page 101:

  '*7. High recovery of ammonia in the process, with the total losses of ammonia in waste waters from the distillation unit of less than 0.9 kg N-NH_3 per tonne of soda ash produced. It should be noted, however, that older equipment may not be able to achieve such levels, as significant additional quantities of steam which has both the cross-media effects of emissions associated with the steam generated, as well as a significant increase in cost, are required. – see Sections 2.3, 2.3.3.5, 2.4.1 and, in particular, to Section 2.4.6.*

  8. The quantity of waste waters, discharged from the distillation unit to a local watercourse, in the range of 8.5 – 10.7 m^3 per tonne of soda ash produced – see Sections 2.3.1, 2.3.4.1, 2.3.4.1.2 and 2.4.7.'

  From this information, a concentration of 84 – 106 mg/l N-NH_3 can be calculated. This ammonium-nitrogen would be included in the parameter N_{inorg}.

EIPPCB assessment

- The footnote 10 in Table 4.1 related to the BAT-AELs for TN and N_{inorg} already makes clear that the BAT-AELs do not apply to installations without biological treatment. This footnote covers the specific case of the production of soda ash via the Solvay process.

EIPPCB conclusion

Taking these aspects into account, the EIPPCB considers that the split view is not supported by appropriate technical arguments, given that it is already covered by a footnote. This split view will therefore not be reported in the '*Concluding remarks and recommendations for future work*' section of the BREF.

6 BAT-AEL FOR EMISSIONS OF TOTAL NITROGEN (TN), TOTAL INORGANIC NITROGEN (N_{INORG}), AND TOTAL PHOSPHOROUS TO WATER

Conclusion of the meeting
Slides 65, 66, and 70 on Table 4.1:

Parameter	***BAT-AEL (yearly average)***	***Conditions***
Total nitrogen (TN) ([9])	*5 – 25 mg/l ([10]) ([11])*	*The BAT-AEL applies if the emission exceeds 2.5 t/yr.*
Total inorganic nitrogen (N_{inorg}) ([9])	*5 – 20 mg/l ([10]) ([11])*	*The BAT-AEL applies if the emission exceeds 2 t/yr.*
Total phosphorous	*0.5 – 3 mg/l ([12])*	*The BAT-AEL applies if the emission exceeds 300 kg/yr.*

([9]) Either the BAT-AEL for total nitrogen or the BAT-AEL for total inorganic nitrogen applies.
([10]) The BAT-AEL for TN and N_{inorg} do not apply to installations without biological treatment. The lower end of the range is typically achieved when the influent to the biological waste water treatment plant contains low levels of nitrogen and/or when biological nitrification/denitrification can be operated under optimum conditions.
([11]) The upper end of the range may be higher and up to 40 mg/l for TN or 35 mg/l for N_{inorg} as a yearly average if the abatement efficiency is ≥ 70 % as a yearly average (including both pretreatment and final treatment). The abatement efficiency is calculated as indicated in the 'GENERAL CONSIDERATIONS' section of these BAT conclusions.
([12]) The lower end of the range is typically achieved when phosphorus has to be added for the proper operation of the biological waste water treatment plant or when phosphorus mainly originates from heating or cooling systems. The upper end of the range is typically achieved when phosphorus-containing compounds are produced by the installation.

Split view summary
The United Kingdom and CEFIC propose to add footnotes to the BAT-AELs for TN, N_{inorg}, and total phosphorous stipulating that the BAT-AELs do not, or may not, apply when the waste water is discharged to a receiving water body that is not designated as sensitive (vulnerability to nitrate and/or eutrophication).

The split view is accompanied by the following rationale:

- The parameters TN and N_{inorg} are used to prevent/reduce the eutrophication of receiving water bodies whereas the parameter NH_4-N is used to prevent/reduce potential toxic effects.
- BAT-AELs for TN, N_{inorg}, or total phosphorous should only be set when the receiving water body is designated as sensitive according to the Nitrates Directive 91/676/EEC and/or the Urban Waste Water Treatment Directive 91/271/EEC.
- Setting BAT-AELs for TN, N_{inorg}, or total phosphorous in the case of installations located in non-sensitive areas may lead to unnecessary treatment stages being employed. These stages would not be the best option for the protection of the environment as a whole as required by the IED. This is important given the desire to avoid unnecessary energy and resource consumption or waste generation, etc. For example, precipitation with ferric salts may be necessary for phosphorous removal.
- According to Commission Implementing Decision 2013/781/EU on granting a derogation requested by the United Kingdom of Great Britain and Northern Ireland with regard to England, Scotland and Wales pursuant to Council Directive 91/676/EEC concerning the protection of waters against pollution caused by nitrates from agricultural sources, the '… *designated vulnerable zones to which the action*

programmes apply…cover 58% of the total area of England, 14% of the total area of Scotland and 2.3% of the total area of Wales.'

- Several installations in the surveys reported that they are not located in areas sensitive to eutrophication. A number of these would not achieve some or all of the agreed BAT-AEL ranges for TN, N_{inorg}, and total phosphorous, for example #37 (ES), #57 (FR), #74 (DK), #83 (ES), and #118 (FR). More installations from the surveys that did not report whether or not they were located in an area sensitive to eutrophication may actually discharge to areas that are designated non-sensitive.
- A number of installations in the United Kingdom have reported to be located in non-sensitive areas (i.e. #107, #108, #109, #110, #115, and #116). They do not have permit requirements for TN, N_{inorg}, or total phosphorous and would need additional treatment stages.
- Although not reported in the surveys, some other installations located in the United Kingdom (i.e. #112, #114, and #121) are believed to discharge to non-sensitive zones.
- Installation #108 (UK) discharges to a sea area that is not designated as sensitive. The influent to the waste water treatment plant contains high concentrations of nitrogen. Although nitrification and denitrification are employed, the agreed BAT-AEL ranges cannot be achieved because the only available carbon source for denitrification is also high in nitrogen. It would require significant capital investment, operating chemicals and energy consumption to reduce the nitrogen content to the emission levels indicated. The overall environmental impact of the plant has been assessed and the treatment optimised to minimise the overall impact.

EIPPCB assessment

- For each parameter/pollutant, the impact of the emission depends on the quality and quantity of the waste water as well as on the sensitivity of the receiving environment. This is neither a specific issue for the parameters TN/N_{inorg}/total phosphorous nor a specific issue for the CWW BREF.
- BAT-AEL exemptions depending on the sensitivity of the receiving water body were neither included in previously adopted BAT conclusions nor in the existing BREF series.
- The IED gives a general preference to pollution prevention in Article 1:

  '*This Directive lays down rules on integrated **prevention** and control of pollution arising from industrial activities.*

  *It also lays down rules designed **to prevent or, where that is not practicable, to reduce** emissions into air, water and land and to prevent the generation of waste, in order to achieve a high level of protection of the environment taken as a whole.*'

- The IED already contains provisions for potential derogations from BAT-AELs due to the geographical location or the local environmental conditions (Article 15 (4)):

  '*By way of derogation from paragraph 3, and without prejudice to Article 18, the competent authority may, in specific cases, set less strict emission limit values. Such a derogation may apply only where an assessment shows that the achievement of emission levels associated with the best available techniques as described in BAT conclusions would lead to **disproportionately higher costs compared to the environmental benefits** due to:*

  *(a) **the geographical location or the local environmental conditions** of the installation concerned; or*
  *(b) **the technical characteristics** of the installation concerned. …*'

- The IED also contains provisions when environmental quality standards require stricter conditions (Article 18):

  '*Where an environmental quality standard requires stricter conditions than those achievable by the use of the best available techniques, additional measures shall be included in the permit, without prejudice to other measures which may be taken to comply with environmental quality standards.*'

- According to the Seventh report on the implementation of the Urban Waste Water Treatment Directive (COM(2013) 574 final), the share of EU territory designated or considered as sensitive area reached almost 75 % in 2010.
- According to the latest report on the implementation of the Nitrates Directive (COM(2013) 683 final), the share of EU territory designated or considered as nitrate vulnerable zones (i.e. including the areas of Members States that apply a whole territory approach) corresponded to approximately 47 % in 2012.
- Installation #57 (FR) from the surveys did not provide information if discharges are to a designated sensitive or non-sensitive area.
- The installations #107, #108, #109, #110, #112, #114, #115, #116, and #121 in the United Kingdom did not report any emission level for TN, N_{inorg}, or total phosphorous. Therefore, one cannot judge if these installations would need additional treatment steps to achieve emission levels within the BAT-AEL ranges of these parameters.
- Except for installation #108, no technical rationale is given why the cited installations could not achieve emission levels within the agreed BAT-AEL ranges (i.e. information about the techniques used).
- The reported final treatment techniques and/or the emission levels of a number of the cited installations suggest that the performance of the waste water treatment could be improved, for example:

Installation	MS	Production of	Year	Final treatment	BOD_5 in mg/l	TSS in mg/l
#37	ES	SIC, LVOC, OFC, POL	2011	Activated sludge process	141	92
#57	FR	OFC (pesticides)	2007	Activated sludge process	39	122
#107	UK	OFC (pharmaceuticals)	2011	Collection and potential pH adjustment ([1])	268	NI
#108	UK	OFC (pharmaceuticals)	2011	Activated sludge	1116	2924
#109	UK	OFC (pharmaceuticals)	2011	pH adjustment and flow balancing ([1])	NI	NI
#110	UK	OFC (pharmaceuticals)	2011	Collection and potential pH adjustment ([1])	157	582
#114	UK	OFC (pesticides, agrochemicals)	2011	Sedimentation, sand filtration, dilution ([1])	NI ([2])	150
#116	UK	SIC	2011	pH adjustment and dilution ([1])	613	27

([1]) No biological treatment reported.
([2]) The installation reported a target of TOC = 500 mg/l.

NB: LVOC = large-volume organic chemicals; NI = no information provided; OFC = organic fine chemicals; POL = polymers; SIC = speciality inorganic chemicals.

- Installation #108 (UK) did neither report concentrations of TN/N_{inorg} in the surveys nor the use of denitrification. In 2011, very high ammonium concentrations in the influent to the final biological waste water treatment plant were reported (NH_4-N ~800 mg/l), together with an abatement efficiency of around 76 % resulting in

effluent concentrations of approximately 190 mg/l. Furthermore, high concentrations of BOD_5 (~1.1 g/l) and TSS (~2.9 g/l) in the effluent were reported. The latter data suggest that there is room for improvement of the performance of the biological waste water treatment plant. Considering that installation #108 produces antibiotics (i.e. substances with an intended biological effect), there are also doubts about the claimed optimised environmental impact.

EIPPCB conclusion

Taking these aspects into account, the EIPPCB considers that the split view is not supported by appropriate technical arguments. Furthermore, this split view is considered to be related to implementation issues, which are considered to go beyond the mandate of the TWG. This split view will therefore not be reported in the '*Concluding remarks and recommendations for future work*' section of the BREF.

7 BAT-AEL FOR EMISSIONS OF ZINC TO WATER

Conclusion of the meeting
Slides 77 and 78 on Table 4.1:

Parameter	***BAT-AEL (yearly average)***	***Conditions***
Zinc (expressed as Zn)	*20 – 300 µg/l ([15]) ([16]) ([19])*	*The BAT-AEL applies if the emission exceeds 30 kg/yr.*
([15]) The lower end of the range is typically achieved when only a few of the corresponding metal (compounds) are used or produced by the installation. *([16]) This BAT-AEL may not apply when the main pollutant load originates from the processing of large volumes of solid inorganic raw materials that are contaminated with metals (e.g. soda ash from the Solvay process, titanium dioxide).* *([19]) This BAT-AEL may not apply to inorganic effluents when the main pollutant load originates from the production of inorganic heavy metal compounds.*		

Split view summary
Germany and CEFIC propose to add a footnote to the BAT-AEL for emissions of Zn to water stipulating that the BAT-AEL may not apply when the main pollutant load originates from the production of viscose.

The split view is accompanied by the following rationale:

- In the POL BREF (August 2007), the BAT-AEL for emissions of Zn to water from the production of viscose is set at 1.5 mg/l. Viscose-producing plants therefore would not comply with the agreed BAT-AEL in the CWW BREF.
- Conflicting conclusions between the horizontal CWW BREF and the other chemical BREFs should be avoided. More specific conclusions should prevail over more generic ones (*lex generalis* versus *lex specialis*).
- More specific data on Zn emissions from the production of viscose were gathered during the drawing up of the POL BREF. During the review of the CWW BREF, only generic data were collected.

EIPPCB assessment

- The POL BREF (August 2007) stipulates in Section 13.10, BAT 6 on page 275:

  '*6. BAT is to reduce Zn from the waste water by alkaline precipitation followed by sulphide precipitation (see Section 12.7.6)*

  BAT is to achieve 1.5 mg/l of Zn. …'

  The averaging period related to this level and the associated monitoring are not specified in the BAT chapter.
- The two surveys did not seem to include any installation that produces viscose.

EIPPCB conclusion
Taking these aspects into account, the EIPPCB considers that the split view is supported by appropriate technical arguments. This split view will therefore be reported in the '*Concluding remarks and recommendations for future work*' section of the BREF.

A possible formulation of this split view could be: '*Germany and CEFIC expressed a dissenting view that the BAT-associated emission level (BAT-AEL) for emissions of zinc to water may not apply when the main pollutant load originates from the production of viscose*.'

8 ABSENCE OF BAT-AELS FOR EMISSIONS TO AIR

Conclusion of the meeting
Slide 98: '*Do not set BAT-AELs for emissions to air.*'

Split view summary
Austria, Denmark, Germany, and the Netherlands propose to set BAT-AELs for emissions to air.

The split view is accompanied by the following rationale:

- The proposal for setting BAT-AELs for emissions to air had been submitted previously on a number of occasions, including during the commenting period on Draft 2 and via a number of letters/emails from several Member States:

Letter/email from	Date
AT	09/12/2010
DE	26/06/2011
AT, BE, DE, IT, NL	07/10/2011
NL	26/04/2012
DE	27/04/2012
NL	27/09/2012
DE	05/10/2012
DK	05/10/2012

- Although the IED Article 13 Forum discussed the interface between the CWW BREF and the other chemical BREFs, no decision on BAT-AELs for emissions to air in the CWW BREF was taken.
- Germany, Spain, and the United Kingdom submitted data on emissions to air.
- Belgium and the Netherlands drafted factsheets especially for emissions to air.
- BAT-AELs could be derived for common abatement techniques (e.g. for fabric filters) or could be taken from other BREFs.
- Additional data could have been gathered as was done concerning emissions to water.

EIPPCB assessment

- The EIPPCB informed the TWG on the issue of the collection of installation-specific data on waste gas end-of-pipe treatment techniques in its letter dated 18 February 2011. To summarise:
  - The original CWW BREF (February 2003) did not contain BAT-AELs for emissions to air from chemical production processes. It was recommended to leave this task to the other chemical BREFs, because these levels were identified as process-specific and hence no levels could be given that consider the whole chemical sector.
  - In line with this conclusion, with the wishes received for the review of the CWW BREF, and with the conclusions of the kick-off meeting held in June 2008 in Seville, no questionnaire to gather installation-specific data for emissions to air was initially designed.
  - In its comments to the first draft of the revised CWW BREF, Germany proposed to collect such installation-specific data. On 23 July 2010, the EIPPCB therefore invited the TWG to provide such data and to pay particular attention to the IEF document on '*Improving the collection and submission of data for deriving useful BAT conclusions*' (IEF 20–4 dated June 2008). Three Member States subsequently submitted data (Germany, Spain, and the United Kingdom). However, the EIPPCB

communicated to the TWG on 5 November 2010 that in its opinion these data did not fulfil the criteria of the aforementioned guidance.
    - As a consequence, the EIPPCB asked the TWG on 30 November 2010 if an additional data collection via questionnaires should be carried out and if TWG members were in a position to collect such information. By 19 January 2011, the EIPPCB had received feedback from eleven Member States and three industrial organisations. About half of the TWG members supported an additional data collection while the other half did not support it. In particular, Austria and Germany supported the additional data collection and indicated their preparedness to provide data. The Netherlands supported the additional data collection, but indicated that they could not guarantee their provision and that it would be difficult to derive BAT-AELs that are valid for the whole chemical sector. Denmark did not submit an opinion at that time.
    - Given the limited TWG support, the wide ranges of processes and techniques that could potentially be better addressed in the other chemical BREFs, as well as the potential delays to the CWW BREF review process, the EIPPCB advised the TWG on 18 February 2011 that it would not embark on an additional data collection on emissions to air, thereby following the decision taken at the kick-off meeting.
- The Commission Implementing Decision 2012/119/EU stipulates:

  Section 3.3 on page 20:
  '*An environmental performance level associated with BAT will be included where there is a* ***sound basis*** *for doing so. This will be done based on the information exchanged by the TWG* ***taking into account the quantity and quality of the plant-specific data*** *received during the exchange of information.*'

  Section 5.2 on page 30:
  '*It is therefore crucial that TWG members* ***supply complete data sets at least at the plant level*** *as is detailed in Section 5.4.* ***Data aggregated from several plants/installations are usually not sufficient*** *to allow for concluding on BAT and/or BAT-associated environmental performance levels (see Sections 3.3.1 and 3.3.2).*'

- Data on emissions to air were provided by Germany, Spain and the United Kingdom, but some contextual information was however missing.
- Factsheets and information on common abatement techniques are not equivalent to plant-specific information gathered via questionnaires and therefore not a sufficient basis to set BAT-AELs.
- During the drawing up of the original chemical BREFs, BAT-AELs were not sufficiently based on plant-specific information.
- With hindsight one could argue that sufficient time had been available to carry out another data collection.
- The TWG concluded to add a recommendation in the Chapter on '*Concluding remarks and recommendations for future work*' that installation-specific data with relevant contextual information on emissions to air should be gathered during the next review of the CWW BREF and/or as part of the review of the chemical BREFs in order to assess the possibility of setting BAT-AELs.

EIPPCB conclusion
Taking these aspects into account, the EIPPCB considers that the split view is supported by appropriate technical arguments. This split view will therefore be reported in the '*Concluding remarks and recommendations for future work*' section of the BREF.

A possible formulation of this split view could be: '*Austria, Denmark, Germany, and the Netherlands expressed a dissenting view that BAT-AELs for emissions to air should be included in the BAT conclusions*.'

9 BAT ON MONITORING OF DIFFUSE VOC EMISSIONS

Conclusion of the meeting
Slides 116 and 117 on BAT 4:

'***BAT 4. BAT is to periodically monitor diffuse VOC emissions to air from relevant sources by using all of the techniques given below.***

I. sniffing methods (e.g. with portable instruments according to EN 15446) associated with correlation curves for key equipment;
II. optical gas imaging techniques;
III. calculation of emissions based on emissions factors, periodically validated (e.g. once every two years) by measurements.

For installations where large amounts of VOCs are handled, the three techniques are complementary. The screening and quantification of emissions from the installation by periodic campaigns with optical absorption based techniques, such as Differential absorption light detection and ranging (DIAL) or Solar occultation flux (SOF) is a useful complementary technique to the techniques I to III.

Description
See Section 1.6.2.

Applicability
The applicability of BAT 4 might be restricted depending on the nature, scale and complexity of the installation.'

Split view summary
CEFIC proposes to modify the BAT conclusion on the monitoring of diffuse VOC emissions as follows:

- Replace '*using **all** of the techniques given below*' by '*using **one or a combination** of the techniques given below*'.
- Delete '*For installations where large amounts of VOCs are handled, the three techniques are complementary*.'
- Replace '*The screening and quantification of emissions from the installation by periodic campaigns with optical absorption based techniques, such as DIAL or SOF **is a useful complementary technique** to the techniques I to III.*' by '*The screening and quantification of emissions from the installation by periodic campaigns with optical absorption based techniques, such as DIAL or SOF **may be a useful additional technique** to the techniques I to III.*'

The split view is accompanied by the following rationale:

- The best method for monitoring diffuse VOC emissions depends on the type and size of the chemical plant as well as on the cost-effectiveness for a given situation. Each method has specific advantages and disadvantages and therefore should be used in the appropriate cases.
- Sniffing methods and optical gas imaging techniques address fugitive VOC emissions and are typically carried out as part of a leak-detection-and-repair (LDAR) programme. Fugitive VOC emissions are not always a significant contributor to the total diffuse VOC emissions, for example in the case of plants producing polymers or organic fine chemicals, and in plants handling substances with low volatility.

- Sniffing methods and optical gas imaging techniques are not complementary but overlapping as they pursue the same goal.
- The disadvantage of sniffing methods is that they are expensive and time-consuming for large installations. Optical gas imaging methods are able to detect the most significant fugitive VOC emissions. Compared to sniffing methods, an equivalent reduction of fugitive VOC emissions can be achieved over a number of years.
- LDAR and sniffing methods may not be necessary when high-integrity equipment is used in combination with appropriate installation and maintenance procedures. Occasional cross-checks with an optical gas imaging technique can provide additional reassurance.
- The calculation of emissions based on emission factors addresses fugitive VOC emissions when no LDAR is in place, but also the remaining diffuse VOC emissions (e.g. from tanks). In cases where emissions are not significant, such calculations provide satisfactory results.
- There is limited experience with the reliability of DIAL and SOF and also uncertainty about the emission quantification. DIAL and SOF are not complementary to the other monitoring techniques, but instead they are overlapping with them.

EIPPCB assessment

- The rationale is based on documents provided by CEFIC before issuing Draft 2.
- A description of monitoring techniques for diffuse VOC emissions can be found in Sections 3.4.3 and 3.4.4 of the revised Draft 2 of the CWW BREF (November 2013), as well as in Section 3.26.1.3 of the Final Draft of the revised REF BREF (July 2013). From these sections it becomes clear that each of the three monitoring methods (sniffing, optical gas imaging, calculation based on emission factors) has limitations that could be compensated by using a combination of techniques. For example, sniffing and optical gas imaging are not used to monitor diffuse VOC emissions other than fugitive emissions. Other examples are that sniffing cannot be used if the emission source cannot be accessed and that optical gas imaging is well-suited to leak detection but that emission quantification is less straightforward. Therefore, the three monitoring techniques are complementary even though there are some overlapping features.
- The techniques listed and described in the BAT conclusions are neither prescriptive nor exhaustive.
- The BAT conclusion contains a number of flexibility elements such as a generic applicability restriction and a BAT statement that refers to relevant sources and to periodic monitoring without fixing the monitoring frequency.
- Nevertheless, even if the BAT on diffuse VOC monitoring is applicable to a specific chemical site, the examples presented in the rationale might justify that the use of all three monitoring techniques may not be necessary in some cases.
- There is limited experience with the use of DIAL and SOF on chemical sites. Section 3.4.4 of the revised Draft 2 of the CWW BREF (November 2013) only gives some petrochemical sites as examples.

EIPPCB conclusion

Taking these aspects into account, the EIPPCB considers that some elements of the split view are supported by appropriate technical arguments. This split view will therefore be reported in the '*Concluding remarks and recommendations for future work*' section of the BREF.

A possible formulation of this split view could be: *'CEFIC expressed a dissenting view that the BAT on monitoring of diffuse VOC emissions should stipulate that:*

- ***one or a combination** of the techniques sniffing, optical gas imaging, or calculations based on emission factors should be used instead of all techniques;*

- *Differential adsorption light detection and ranging (DIAL) or Solar occultation flux (SOF)* ***may*** *be useful complementary techniques*.'