29 July 2004

German comments

on the
General Technical Guideline for Environmentally Sound Management of Wastes Consisting of, Containing or Contaminated with Persistent Organic Pollutants
(draft of 15 May 2004)

and on the
Technical Guideline for Environmentally Sound Management of Wastes Consisting of, Containing or Contaminated with PCBs, PCTs and PBBs
(draft of 15 May 2004)

I. General comments

These comments only address some issues in the Guidelines. Comments on other issues may be made after revised drafts have been circulated.
It is noted that a possible review clause mentioned under II. sections 3.1 below is also possible for other areas like levels of destruction and environmentally sound methods.

II. Important issues with respect to both Guidelines

Sections 3.1 (Low POP/PCB content, paras. 34 and 37 respectively)

With regard to PCB, a value of 50 mg/kg is supported.
Rationale: Also for liquids, mg/kg should be used because volume changes with temperature. It should not be referred to dry mass in this definition; e. g. in entry A3180 of Annex VIII of the Basel Convention or in the EU Directive 96/59/EC on disposal of PCBs and PCTs it is also referred to 50 mg/kg.

With regard to PCDD and PCDF, any value between 10 and 50 µg TEQ/kg could be accepted. It is suggested that PCDD-like PCBs which have toxicity equivalency factors according to the WHO are included in these values;

With regard to the other POPs, any value between 5 and 50 mg/kg could be accepted.

A possible compromise on this issue may include a provision in the related COP7 decision that a review clause is included to the effect that the provisional low POP contents are reviewed after say 4 years and that, based on the experiences at that time, the values may or may not be changed through a COP decision thereafter (in say 5 or 6 years).
Another possibility for a compromise may be to agree on a value in between the current ranges for PCDD and PCDF and the other POPs, respectively.

Sections 3.2 (Levels of destruction and irreversible transformation)

With regard to para. 34(i) and 38(i) respectively (destruction efficiency), Germany has reservations because we currently have no data on destruction efficiencies of facilities in Germany. In addition, POPs may be formed in thermal processes without any input of POPs (de-novo synthesis); in this case there is no meaningful destruction efficiency.
The effort to gather information on the destruction efficiency of a facility is rather high, due to the requirement to measure the POP contents in all releases and a complex calculation (because wastes containing or highly contaminated with POPs often need to be incinerated together with other wastes). The practical implementation of this parameter seems to be difficult. Instead, established parameters such as temperature and residence time are a useful

approach for incineration processes whereby these parameters should be set dependent on the content of halogenated organic substances, expressed as chlorine[1]. Together with limit values for all releases they are able to ensure a proper level of destruction.

With regard to para. 34(ii) and 38(ii) respectively (limits in solid wastes), Germany generally supports to require specific limit values for the POP content in solid wastes from facilities. However, more time is needed to evaluate which limit values would be appropriate.

Sections 4.7.1 (Pre-treatment)

4.7.1.4 pH Adjustment: It is not clear which treatment technologies are meant by "some" other than oil/water separation. If pH adjustment is only relevant for oil/water separation, then this section should be merged with section 4.7.1.3.

4.7.1.5 Screening: It should be explained in more detail what is meant by "screening" since this term is not commonly used in waste management in Europe. Is it a kind of mechanical separation (see suggestion for a new section below)?.

It is suggested to insert the following new sub-section

"**4.7.1.x Mechanical separation**

Where only part of a product or waste, such as waste equipment, is containing or contaminated with POPs, these parts should be separated and then disposed of according to sections 4.7.1-4 as appropriate."

In addition, it is suggested to insert the following in para. 94 of the PCB guideline (section 4.7.1.7) as second sentence:

"Liquids contaminated with PCB should be removed from the equipment first; the equipment should be decontaminated, i.e. the equipment should be cleaned so that it can be re-used, recycled or disposed of, if the PCB content in the liquid is above 1 mg/kg. Such liquids removed should be treated according section 4.7.2 if the PCB content is above 1 mg/kg."

<u>Rationale</u>: As per report of the Contact Group at OEWG3, para. 7 it was agreed to generally include the suggestions regarding waste equipment containing or contaminated with PCBs as contained in Issue paper 1 (comments from Belgium) in the revised draft for further discussion. The text above are suggestions for corresponding changes.

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[1] E.g. the Waste Incineration Directive 2000/76/EC of the EU specifies the following:
Preamble (18): "The incineration of hazardous waste with a content of more than 1 % of halogenated organic substances, expressed as chlorine, has to comply with certain operational conditions in order to destroy as many organic pollutants such as dioxins as possible.";
Art. 4(5): "The permit granted by the competent authority to an incineration or co-incineration plant using hazardous waste shall … :
(a) … ;
(b) specify the minimum and maximum mass flows of those hazardous wastes … and their maximum contents of pollutants, e.g. PCB, … chlorine, fluorine, ….":
Art. 6(1): For incineration plants, the temperature has to be raised from 850°C to 1100°C for at least two seconds if the content of halogenated organic substances, expressed as chlorine, is higher than 1 %;
Art. 6(2): For co-incineration plants, the temperature has to be raised from 850°C to 1100°C if the content of halogenated organic substances, expressed as chlorine, is higher than 1 %.

It is also suggested to order the sub-sections in a more logic way inter alia the following:
- Section 4.7.1.8 (Thermal Desorption) should be moved after section 4.7.1.1 (Adsorption/ Absorption)
- Section 4.7.1.7 (Solvent Washing) should be moved before section 4.7.1.2 (Dewatering)

Sections 4.7.2 (Destruction and irreversible transformation methods)

The following new para. 132a is suggested:

"132a. The following disposal operations, as provided for in Annex IVA and IVB of the Basel Convention, should be permitted for the purpose of destruction and irreversible transformation of the POP content in wastes when applied in such a way as to ensure that the remaining wastes and releases do not exhibit the characteristics of POPs:

D9 Physico-chemical treatment,
D10 Incineration on land, and
R1 Use as a fuel (other than in direct incineration) or other means to generate energy.

Pre-treatment operation prior to such destruction or irreversible transformation may be performed, provided that POPs that are isolated from the waste during the pre-treatment are subsequently disposed of according to operations D9 or D10. In addition, repackaging and temporary storage operations may be performed prior to such pre-treatment or prior to such destruction or irreversible transformation."

Rationale: cf. Article 7(2) and Annex V Part 1 of the EU POP Regulation, "translated" into Basel guideline language.

With regard to sections 4.7.2.2 and 4.7.4.2 it is suggested to refer to pertinent national legislation, e. g. the EU Waste Incineration Directive.

It is also suggested to bring the sub-sections in the same order as in para. 4(b) of the OEWG3 decision.

Sections 4.7.3 (Other disposal methods when destruction or irreversible transformation does not represent the environmentally preferable option)

The following new para. 166a is suggested:

"166a. For wastes with a POP content above the low POP contents referred to in section 3.1, a country may allow wastes listed in Table 2 containing or contaminated by any POP to be otherwise disposed of than as referred to in section 4.7.2 in accordance with a method listed in Table 2 under the following conditions:

i) the holder concerned should demonstrate to the satisfaction of the competent authority of the country concerned that destruction or irreversible transformation of the POP content, performed according to best environmental practice or best available techniques, does not represent the environmentally preferable option; the competent authority should subsequently authorise the alternative operation; and

ii) this operation should be in accordance with pertinent national legislation and relevant international guidelines and decisions."

In addition, the following table 2 is suggested:

"Table 2: Wastes and methods when destruction or irreversible transformation does not represent the environmentally preferable option (refers to para. 166a)

Wastes when containing Annex I material to an extent causing it to exhibit an Annex III characteristic	Operation
1. The following waste from thermal processes (power stations and other combustion plants (except plants in No. 4), iron and steel industry, aluminium, lead, zinc, copper and other non-ferrous thermal metallurgy and casting of ferrous pieces): bottom ash, slag, salt slags, fly ash, boiler dust, flue-gas dust, other particulates and dust, solid wastes from gas treatment, black drosses, wastes from treatment of salt slags and black drosses, dross and skimmings.	Permanent storage only in: – safe, deep, underground hard rock formations, or – salt mines whereby the provisions of section 4.7.4.2 and pertinent national legislation, inter alia Council Directive 1999/31/EC and Council Decision 2003/33/EC of the European Union should be adhered to.
2. Carbon-based and other linings and refractories from metallurgical processes.	
3. The following construction and demolition waste: i) mixtures of, or separate fractions of concrete, bricks, tiles and ceramics, ii) Inorganic fraction of soil and stones, iii) construction and demolition wastes containing PCB, excluding PCB containing equipment.	
4. The following wastes from incineration or pyrolysis of waste: solid wastes from gas treatment, bottom ash, slag, fly ash and boiler dust.	
5. The following wastes waste from vitrification: fly ash and other flue-gas treatment wastes and non-vitrified solid phase.	
6. Other wastes which are similar to those contained in No. 1 to 5 above.	

[1] Council Directive 1999/31/EC of 26 April 1999 on the landfill of waste (OJ L 182, 16.7.1999, p. 1).

[2] Council Decision 2003/33/EC of 19 December 2002 establishing criteria and procedures for the acceptance of waste and landfills pursuant to Article 16 of and Annex II to Directive 1999/31/EC (OJ L 11, 16.1.2003, p. 27)."

<u>Rationale</u>: cf. Article 7(4)(b) and Annex V Part 2 of the EU POP Regulation, "translated" into Basel guideline language. It is not referred to decontamination as mentioned in Art. 7(4)(b)(i); instead see the suggestions related to this issue for section 4.7.1 above. A reference to hazardous waste landfills in Table 2 could be accepted if appropriate maximum concentration limits for POPs would suggested; this is necessary because the EU Landfill Directive and the related Council Decision do not contain specific limits for POPs.

Sections 4.7.4 (Other disposal methods when the POP content is low)
Para. 168 should be replaced by the following text:
"168. This section covers waste contaminated with POPs at concentrations below the low POP content as referred to in section 3.1. There is no concentration level below which this section does not apply in accordance with the Stockholm Convention."

Delete para. 169 and move the text of this para. to para. 132.

Sections 4.7.4.1 (Hazardous waste landfill)
Delete para. 171.v, because wastes such as electronic waste or small containers of household pesticides should not be landfilled on purpose.

Sections 4.7.4.1.1 (Immobilization)
Para. 173: Is chemically binding of POPs (fixation) possible?
In the European Commission Decision 2000/532/EC, the terms stabilisation and solidification are used (fixation is not used) and defined as follows:
"Stabilisation processes change the dangerousness of the constituents in the waste and thus transform hazardous waste into non-hazardous waste. Solidification processes only change the physical state of the waste by using additives, (e.g. liquid into solid) without changing the chemical properties of the waste."
It is questionable if wastes contaminated with POPs can be solidified for sufficiently long periods of time (some centuries).

Para. 175.i: Criteria for treatability tests should be mentioned.
Para. 175.ii: Weathering and freeze-thaw cycles used for construction materials simulate only several decades. It is questionable if this is sufficient because the half time of POPs in a hazardous waste landfill is assumed to be some centuries.

Sections 4.7.4.2 (Permanent storage in salt mines [and hard rock])
Replace text in para. 176 by:
"Permanent storage in facilities located in salt mines [and hard rock] is an option to separate hazardous wastes from the biosphere for geological periods of time. A site-specific security assessment according to pertinent national legislation such as the provisions contained in Appendix A to the Annex of the European "Council Decision 2003/33/EC of 19 December 2002 establishing criteria and procedures for the acceptance of waste at landfills pursuant to Article 16 of and Annex II to Directive 1999/31/EC" should be performed for every planned underground storage."

Replace text in para. 177 by:
"Any waste to be disposed of in an underground storage should be subject to an acceptance procedure laid down by the competent authority. The wastes should be stored in chemically and mechanically secure containers. They should be disposed of in such a way that any undesirable reaction between different wastes as well as between wastes and storage lining is excluded. Wastes that are either liquid, gaseous, causing toxic gases, explosive, flammable or infectious should be excluded from underground storage. The competent authority may define waste types which should be generally excluded."

Replace text in para. 178.i by:
"caverns or tunnels used for storage should be completely separated from active mining areas and should not to be opened for mining again"

Background information with regard to permanent storage in salt mines can be found in Annex 1.

Section 4.7.4.2 may be extended to also cover hard rock formations. Germany has no experiences with hard rock; may be experiences have been made in Sweden.

New Section 4.7.4.x (Recovery of certain wastes)
Insert a new section along the following lines:
"178a. Inter alia the following should be required with regard to the recovery of wastes contaminated with POPs:

i) Waste wood may be used for material recycling only if the PCB content is below 5 mg/kg;
ii) Waste oil may be reprocessed as oil only if the PCB content is below 20 mg/kg;
iii) Sewage sludge may be used as fertilizer only if the PCB content is below 0.8 mg/kg (7 congeners) and the PCDD/PCDF content is below 0.1 µg TEQ/kg; and
iv) Soils may be used for recultivation layers of landfills only if the PCB content is below 0.1 mg/kg."

178b. For further information on pertinent national legislation in this area please refer to Appendix 1."

Rationale: Taking into pertinent national legislation, some recommendations in priority areas should be made. Further comments regarding soils (excavated contaminated soils, recovery of wastes through putting wastes on land, e.g. for construction purposes) may be made at a later stage. A selection of such national legislation can be found in Annex 2 (updated table compared to the table distributed by the German delegation at OEWG3)

III. Some other specific comments on the General guidelines

Section 2.1.2, para. 21
Regarding a text with respect to Annex IX (B List), it is suggested not include any text.
Rationale: After reconsidering the entries in List B, a reference to specific entries does not seem to be necessary, also given the chapeau of this list ("Wastes contained in the Annex will not be wastes covered by Article 1, paragraph 1 (a), of this Convention unless they contain Annex I material to an extent causing them to exhibit an Annex III characteristic")

Section 4.3 (Waste prevention and minimization)
Para. 73.v: It should be clarified what "formula modifications" are.

IV. Some other specific comments on the PCB guidelines

Section 1.2.1.1 (PCBs)
Para. 5, first sentence: Replace "two chlorine atom" by "one chlorine atom".

Rationale: Commonly known as chlorobiphenyls, PCB is a group of halogenated aromatic hydrocarbons (arenes) characterized by the biphenyl structure (two phenyl rings $(C_6H_5)_2$) and at least **one** chlorine atom substituted for hydrogen. It is not clear, why at least two hydrogen atoms should be substituted with chlorine atoms. The original list of PCB which was with only a few changes accepted by International Union of Pure and Applied Chemistry (IUPAC) starts with the three monochlorobiphenyls[1].
Monochlorobiphenyls are contained in lower chlorinated commercial PCBs at considerable concentrations (e.g. Aroclor 1221: 51 %; Aroclor 1232: 26 %)[2].

Section 1.2.4 (Wastes)
Para. 26: It is suggested to bring the subparas. into the following order (a few changes in the text are suggested as well):

i. equipment containing or contaminated with PCB or PCT (capacitors, circuit breakers, electric motors, electromagnets, heat transfer equipment, hydraulic equipment, switches, transformers, vacuum pumps, voltage regulators); (old ii)
ii. solvents contaminated with PCB or PCT; (old iii)
iii. end-of-life vehicles and shredder light fraction (fluff) containing or contaminated with PCB; (old v and part of old x)
iv. demolition wastes containing or contaminated with PCB (painted materials, resin-based floorings, sealants, sealed glazing units); (old vi)
v. abrasion materials from the removal of coatings containing or contaminated with PCB; (part of old x)
vi. oils consisting of, containing or contaminated with PCB or PCT (dielectric fluids, heat transfer fluids, hydraulic fluids, motor oil); (old i)
vii. electric cables isolated by polymers containing or contaminated with PCB or PBB; (new)
viii. soils and sediments, rock and aggregates (e.g., excavated bedrock, gravel, rubble) contaminated with PCB, PCT or PBB; (old vii and viii)
ix. sludge contaminated with PCB, PCT or PBB; (old ix)
x. plastics containing or contaminated with PBB and equipment containing such materials; (part of old x)
xi. fire suppression equipment containing or contaminated with PBB (old iv)

Old xi. is suggested to be deleted because these guidelines should not cover waste water.

In addition, it is suggested to add a reference to a **list of types and trade names** of equipments potentially containing or contaminated with PCBs in Appendix 1 similar to the excellent list of synonyms and trade names for PCB, PCT and PBB.

Rationale: The aim of this para. is to list typical uses of PCB, PCT and PBB in order to identify and to separate wastes containing PCBs, PCTs or PBBs from other wastes. PCBs and PCTs have generally been used for similar purposes whereas PBBs have mostly been used for different purposes (see below).
*The most important waste is the equipment listed, especially **transformers and capacitors**. **Solvents** containing or contaminated with PCB are formed during cleaning processes mainly of equipment. Liquid paintings and varnishes are not seen as relevant.*

[1] K. Ballschmiter/M. Zell, Analysis of Polychlorinated Biphenyls (PCB) by Glass Capillary Gas Chromatography, Fresenius Z. Anal. Chem. 302, 20-31 (1980)
[2] Heidelore Fiedler et al., Stoffbericht Polychlorierte Biphenyle (PCB), Landesamt für Umweltschutz Baden-Württemberg, Karlsruhe, 1995

*The PCB content of **end-of-life vehicles** and the **shredder light fraction** is also due to small capacitors.*
*The next important case is of PCB as **plastifiers in caulkings** of buildings and **sealed glazing units**. Also timbre claddings or chipboards may be regarded as PCB-containing. Because of the long life of buildings the corresponding wastes will remain relevant for many years.*
*A third, also long-life application are **paintings**, especially anticorrosion-paintings of steel buildings. If the paintings are removed, the **abrasion material** becomes also a waste containing or contaminated with PCBs.*
*Further typical wastes are **waste oils** of different origin and **cables** due to possible mixtures with goods containing or contaminated with PCBs during their recycling.*
***Sewage sludge** is traditionally used as soil fertilizer in the agriculture. The PCB content of sewage sludge is low (0.01 – 0.05 mg/kg dry matter in dependence on the congener) but remains constant during the last years.*
*In **fly ashes**, PCBs are of minor relevance compared with PCDD/PCDFs. Paper, metals, glass and plastics other that mentioned in the subparas. are not seen as relevant.*

***PBBs**, however, have been used in a lot of other applications than PCB, mainly as flame retardants in plastics, but also in paintings. The Danish Information Centre for Environment & Health (Informationscenteret for Miljø & Sundhet) has published some information about brominated flame retardants (in Danish, http://www.miljoeogsundhed.dk/artikel_disc.asp?artikelID=4150).*