

QUESTIONNAIRE

“Study to Support the Review of Waste-related issues in Annexes IV and V of Regulation (EC) 850/2004”¹

1) Aim of the questionnaire

The following questionnaire has been prepared by BiPRO GmbH (part of Ramboll)² in close coordination with the European Commission. The questionnaire aims at gathering up-to-date information and quantitative data on Persistent Organic Pollutants (POPs) and more specifically on waste related issues of certain “new POPs”, “candidate POPs” and “already listed POPs”. The information will provide the EU Commission with the necessary scientific basis to propose amendments to the POP Regulation (EC) 850/2004 (hereafter called “POP Regulation”), due to the listing of new substances and to the review of concentration limits for substances already listed. In addition, the study shall provide guidance on how wastes containing the new POPs may be managed.

2) Background information

POPs are a group of organic compounds that possess toxic properties, persist in the environment, bioaccumulate through the food web and pose a risk to human health and the environment. POPs are transported across international boundaries far from their sources through air, water and migratory species.

The "Protocol to the regional UNECE Convention on Long-Range Transboundary Air Pollution" (CLRTAP) and the Global "Stockholm Convention" on POPs are international, legally binding instruments aiming to reduce and eliminate the production, use and releases of POPs in the territories of all participating parties. Both contain provisions on the environmentally sound management of wastes consisting of, containing or contaminated by POPs (hereafter called “POP waste”).

Although substantial progress has been achieved in limiting the use and application of POPs and reduce their emission into the environment, there are ongoing releases into the environment as well as a constant cycling of substances released in the past. For an optimised approach to elimination, all sectors in the life cycle of a product and of anthropogenic emission sources need to be considered. In this framework, proper waste management can contribute substantially to the reduction of POP releases into the environment, and a comprehensive legislation on POP waste is a necessary pre-requisite.

The Stockholm Convention was implemented into EU Community law in 2004 by the POP Regulation. It foresees an obligation to generally destroy or irreversible transform the POP

¹ Information related to this project on behalf of the European Commission is provided on a dedicated project website at <http://pops-and-waste.bipro.de>.

² BiPRO GmbH (part of Ramboll), Munich, Germany (www.bipro.de), has been contracted by the European Commission to carry out the “Study to support the review of waste-related issues in Annexes IV and V of Regulation (EC) 850/2004”

content of waste above certain concentration limits (the 'low POP content'). In addition, in exceptional cases, waste above the limits may be otherwise managed with defined operations for specified waste types if destruction or irreversible transformation do not represent the environmentally preferable option and the concentration in such wastes are below another threshold (the 'high POP content').³

In 2017, the Conference of the Parties of the Stockholm Convention (SC) decided to add three new substances to the relevant Annexes. Every time a substance is listed as a POP by the SC, the parties have to reflect the listing in domestic legislation. The EU as a party to the Convention is requested to amend the POP Regulation by May 2018 to include these 'new POPs'.

In addition, three substances are currently under review procedures and are likely to be added to the list of POPs under the SC in the next years (the so- called "candidate POPs"). For the new POPs and the candidate POPs, there is a need to improve the knowledge basis regarding quantities that were used in the past, their concentrations and sources, as well as regarding aspects related to waste management in terms of disposal and recycling paths. This information is needed to assess possible disposal options and to establish concentration limits for waste⁴. Consequently, further analysis is needed for the following substances:

- **“new POPs”**: Decabromodiphenylether (decaBDE), short-chain chlorinated paraffins (SCCPs) and Hexachlorobutadiene (HCBD)
- **“candidate POPs”**: Dicofol, Pentadecafluorooctanoic acid (PFOA, perfluorooctanoic acid) and its salts and PFOA-related compounds, Perfluorohexanoic acid (PFHxS) and its salts and PFHxS-related compounds

Furthermore, new scientific information on three substances already listed in the annexes of the SC has raised the necessity of reviewing already established concentration limits. Therefore, the following substances require renewed analysis and, potentially adjustment of the concentration limits:

- **“already listed POPs”**: Hexabromocyclododecane (HBCD), Polychlorinated Biphenyls (PCB), Polychlorinated dibenzo-p-dioxins and dibenzofurans (PCDD/PCDF)

4) Instructions on using the questionnaire

Please note that some of the relevant questions might have already been addressed in requests for information under the SC or the Basel Convention (BC). Submissions from EU member states related to these requests for information will be reviewed and considered as appropriate for the purpose of the actual study.

The present questionnaire is provided as an MS-Word-file and it would be much appreciated to receive your responses using this electronic version. All questions are numbered and highlighted

³ Article 7 of Regulation EC (No) 850/2004

⁴ Note that for SCCPs and HCBD concentration limits are already established in the Annexes IV and V of the POP Regulation. Only for decaBDE new concentration limits need to be established.

in grey. All fields where input is desired are blue.

The questionnaire is structured in three main sections.

- **Section I – “new POPs”:** decaBDE, SCCPs and HCBd
- **Section II – “candidate POPs”:** dicofol, PFOA and PFHxS
- **Section III – “already listed POPs”:** HBCD, PCB and PCDD/PCDF

Please only fill in the sections that you consider relevant and where you can provide specific information. Please provide specific references wherever possible and do not hesitate to also send us additional background information in form of documents, reports, data sets or as links to websites.

We recommend to quickly screen all questions of a section before starting to fill in the information. If a question is unclear or if you desire to discuss a certain aspect, please do not hesitate to contact one of the following contact persons of the project team:

Contact person	E-mail address	Telephone
Mr Alexander Potrykus	apot@ramboll.com	+49 89 978970-100
Mr Milos Milunov	mo@ramboll.com	

All information provided will be used in a transparent and traceable way for the present study. Provided that your agreement is expressed below, submitted non-confidential information will be published on the dedicated project related website⁵. If you wish to submit information on a confidential basis, please indicate this in your response. Any confidential information will only be used in anonymous or aggregated form.

Please indicate in the following table whether you agree with the publication of your answers to the Questionnaires:

Section	Y/N
I.I Occurrence of “new POPs” decaBDE, SCCPs and HCBd	Y
I.II Recycling Operations/Waste Management Options for “new POPs”	Y
I.III Concentration Limits for decaBDE, SCCPs and HCBd	Y
II.I Occurrence of “candidate POPs” Dicofol, PFOA and PFHxS	Y
II.II Recycling Operations/Waste Management Options for “candidate POPs”	Y
II.III Concentration Limits for dicofol, PFOA and PFHxS	Y
III Already listed POPs	Y

⁵ <http://pops-and-waste.bipro.de>

Please return the completed questionnaire and any related documents to popwaste2018@ramboll.com before 29 March 2018.

In case you are rather interested to discuss with us by telephone, please let us know when we could reach you.

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Section I – “new POPs”

Decabromodiphenylether (decaBDE); short-chain chlorinated paraffins (SCCPs); Hexachlorobutadiene (HCBd)

I. Occurrence of “new POPs” decaBDE, SCCPs and HCBd (articles in use, waste, recycled articles as well as (production) processes and unintentional releases)

1. a) Please indicate whether your country /company has **stockpiles of decaBDE, SCCPs or HCBd**.

b) *If yes, please provide information on types, quantity, concentrations, etc.*

a) As far as we are aware, there is no industry using decaBDE, SCCPs or HCBd in Finland. Therefore we think there are no stockpiles either.

b) -

2. Please indicate any known **occurrence and concentration of the “new POPs” decaBDE, SCCPs and HCBd in different articles in use, waste categories and recycled articles**.

decaBDE	Specification of waste/article	Concentration [mg/kg]
Articles in use	None	see remark
Wastes	None	see remark
Recycled articles	None	
SCCPs	Specification of waste/article	Concentration [mg/kg]
Articles in use	Some articles have been seized from the market in market surveillance because of SCCP concentrations exceeding the UTC.	The concentrations reported by European authorities in RAPEX system have been collected in the Basel ESM guidance document (current March-18 draft Annex III)
Wastes	None	
Recycled articles	None	
HCBd	Specification of waste/article	Concentration [mg/kg]
Articles in use	None	
Wastes	None	

Recycled articles	None	

Remarks:

References to some relevant literature on the occurrence of deca-BDE in articles/wastes can be found in the guidance published by the Finnish MoE „Requirements for the management of waste containing persistent organic pollutants“ <http://julkaisut.valtioneuvosto.fi/handle/10024/79201>

3. Please provide information on quantities of waste containing “new POPs” that are currently generated, then disposed of or recycled

“new POPs”	Specification of waste	Waste generated (in kt)	Waste disposed of (in kt)	Waste recycled (in kt)
decaBDE		NA	NA	NA
SCCPs		NA	NA	NA
HCBD		NA	NA	NA

4. Please provide information on wastes containing “new POPs” that are currently recycled (now or in the near future) and on the extent of recycling. If possible, please specify the types of new articles produced from the recycled material.

“new POPs”	Types of waste recycled	Recycling rate [%]	New articles produced from recycled material
decaBDE		NA	NA
SCCPs		NA	NA
HCBD		NA	NA

Remarks:

5. Please indicate up-to-date (reference) measurement (analytical) methods for identifying the presence and levels of the listed “new POPs” in waste.

The few measurements are made by the industry using laboratories that apparently use internationally accepted methods, as available

6. Please indicate known inexpensive *screening methods* for identifying wastes containing “new POPs”

Methods presented in literature for screening brominated flame retardants in plastics are listed for example in Annex 5 of the guidance published by the Finnish MoE „Requirements for the management of waste containing persistent organic pollutants“ <http://julkaisut.valtioneuvosto.fi/handle/10024/79201>

7. Please indicate any known (*production*) processes using decaBDE, SCCPs and HCBd as well as options for the environmental management of their operation and potential related *unintentional releases of these POPs* into the environment.

II. Waste Management Options/Recycling Operations for “new POPs”

8. Waste separation for decaBDE, SCCPs and/or HCBd containing wastes:
 a) How can be **distinguished** between **contaminated and non-contaminated waste**?
 b) Which **separation operations** should preferably be used **in practice to separate contaminated from non-contaminated waste** (please provide further details if available)?
 c) What should be the preferred **waste management options for the contaminated waste fraction** (please provide justification and further details if available e.g. related costs)?

a)
 Brominated flame retardants: See the guidance published by the Finnish MoE „Requirements for the management of waste containing persistent organic pollutants“ <http://julkaisut.valtioneuvosto.fi/handle/10024/79201> (especially annex 5)
 For chlorinated substances, we are not aware of any other methods except for laboratory analyses, considering the diversity of chlorine sources in such waste. However, PVC plastics can be especially considered to possibly contain SCCPs and should be considered as potential POPs containing waste.

b) Preferable separation operations	Relevant waste / new POP	Possible health risks for workers during separation of waste	Separation costs / ton of waste	Explanation / further information
1. Separation of parts containing	WEEE, ELV	Dust		This is a basic approach, see Finnish MoE „Requirements for the management of

BFR				waste containing persistent organic pollutants“
2. Separation of PVC containing parts	WEEE	Dermal		
3.				

Remarks:

Brominated flame retardants: See the guidance published by the Finnish MoE „Requirements for the management of waste containing persistent organic pollutants“

<http://julkaisut.valtioneuvosto.fi/handle/10024/79201> (especially Chapters 9-10 and annexes 5-7)

c)	Preferable waste management operations	Relevant waste / new POP	Possible health risks for workers during waste management (e.g. recycling)	Management costs / ton of waste	Explanation / further information
1.					
2.					
3.					

Remarks:

Brominated flame retardants: See the guidance published by the Finnish MoE „Requirements for the management of waste containing persistent organic pollutants“

<http://julkaisut.valtioneuvosto.fi/handle/10024/79201> (especially Chapters 9-10 and annexes 6-7)

It is unclear whether this „contaminated waste fraction“ refers to concentrations exceeding the upcoming Annex IV limit values or all contaminated amounts. As long as there are no limit values, separation and ESM are difficult to require.

III. Concentration Limits for decaBDE, SCCPs and HCBd

9. Are you aware of any existing concentration limits for decaBDE in waste?

No

10. Which concentration limits for decaBDE in waste according to the POP Regulation would you recommend? Please justify.

As a thought exercise, 1000 mg/kg all BDE congeners. It would be important, however, to obtain confirmation that when decaBDE is present, penta and octaBDE would not be present. This is not very ambitious, but would follow the same logic as the existing BDE values, and reaching even this level can be expected a challenge.

11. At which lower concentration limits for decaBDE in waste would you expect relevant impacts (e.g. on recycling industry)? Please justify.

Any level below the concentrations of use, i.e. even 10 000 ppm would require separation and incineration.

12. Is there a *continued need for the derogation provided for POP-PBDEs in articles produced from recycled materials in the POPs Regulation (i.e. level of 1,000 mg/kg or 0.1% by weight) of POP-PBDEs allowed in articles produced partially or fully from recycled materials?*⁶ Please justify.

When deca-BDE was listed into the Stockholm Convention (decision SC-8/10) no recycling exception was included for deca-BDE. Hence it is not legally possible to have a general derogation in EU POPs Regulation for deca-BDE in articles manufactured from recycled material. (This principle was already confirmed when hexabromocyclododecane was included into the POPs Regulation and it did not have a recycling derogation in decision SC-6/13 of the Stockholm Convention). Since deca-BDE is the most commonly detected BDE in plastic wastes and its concentration in recycled plastics is typically 10-100 times higher than the other POP-BDEs (if the other POP-BDEs are detected at all), **we do not see any need for a continued general derogation for tetra-, penta-, hexa- and hepta-BDE in articles produced from recycled material.**

13. Is an *adjustment of existing POP limit values for SCCPs⁷ and HCB⁸, as specified in Annex IV and V of the EU POP Regulation, and/or additional measures required (e.g. due to any notable developments)?* Please justify.

No

14. Please indicate if, beyond the EU POP Regulation, there are any adjustments to EU legislation needed, resulting from the listing of the “new POPs” decaBDE, SCCPs and HCB⁸ under the Stockholm Convention.

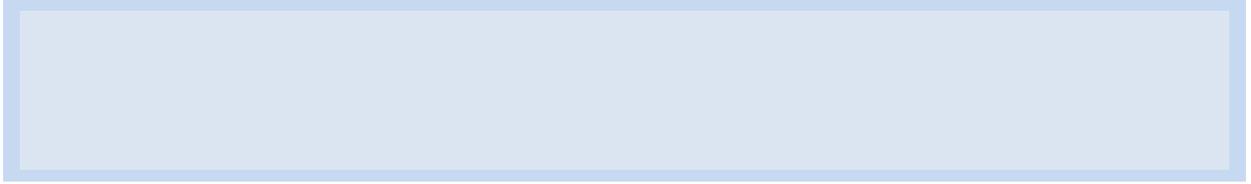
All EC waste legislation that sets specific recycling targets (ELV-directive 2000/53/EC, waste framework directive 98/2008/EU, WEEE-directive 2012/19/EU, etc.) should have a general derogation stating that all recycling targets are calculated from the material left after removal of materials that are required to be disposed of in accordance with the POPs regulation. This amendment should apply to all POP substances and not just the new POPs.

15. Can you provide any other information or information sources relevant to Section I of this questionnaire on the “new POPs”?

⁶ See Annex I Regulation (EC) No 850/2004

⁷ Regulation (EC) 850/2004, Annex IV, concentration limit referred to in Article 7(4)(a): 10 000 mg/kg; Maximum concentration limits of substance listed in Annex IV: 10 000 mg/kg

⁸ Regulation (EC) 850/2004, Annex IV, concentration limit referred to in Article 7(4)(a): 100 mg/kg; Maximum concentration limits of substance listed in Annex IV: 1000 mg/kg



Section II – “candidate POPs”

Dicofol, Pentadecafluorooctanoic acid (PFOA, perfluorooctanoic acid), its salts and PFOA-related compounds, Perfluorohexanoic acid (PFHxS), its salts and PFHxS-related compounds

I. Occurrence of “candidate POPs” Dicofol, PFOA and PFHxS (articles in use, waste, recycled articles as well as production processes and unintentional releases)

16. a) Please indicate whether your country /company has *stockpiles* of “candidate POPs” listed.

b) If *yes*, please provide information on types, quantity, concentrations, etc.

a) We do not think there is dicofol, as it has never been used in Finland. PFOA and PFHxS are more difficult to say, as they could be in old AFFF which is still allowed to be used.

b) There could be PFAS stockpiles in hard-metal plating companies, typically small amounts. We have been following the phase out of PFOS, and the alternatives are often non-fluorinated. However, for AFFF it is difficult to say. Both PFOA and PFHxS are commonly found in areas affected by AFFF use.

17. Please indicate any known *occurrence and concentration of the “candidate POPs”, in different articles in use, waste categories and recycled articles.*

a) Dicofol	Specification of waste/article	Concentration [mg/kg]
Articles in use	None	
Wastes	None	
Recycled articles	None	
b) PFOA, its salts and PFOA-related compounds	Specification of waste/article	Concentration [mg/kg]
Articles in use	None	
Wastes	None.	
Recycled articles	None	
c) PFHxS, its salts and PFHxS-related compounds	Specification of waste/article	Concentration [mg/kg]
Articles in use	None	
Wastes	None	

Recycled articles	None	

Remarks: There are measurements in environmental samples containing both PFOA and PFHxS

18. Please provide information on quantities of waste containing “candidate POPs” that are currently generated, then disposed of or recycled

“candidate POPs”	Specification of waste	Waste generated (in kt)	Waste disposed of (in kt)	Waste recycled (in kt)
Dicofol		0	0	0
PFOA, its salts and PFOA-related compounds	Contaminated soil and water	NA	NA	0
PFHxS, its salts and PFHxS-related compounds	Contaminated soil and water	NA	NA	0

19. Please provide information on wastes containing “candidate POPs” that are currently recycled (or possibly in the future) and the extent of recycling. If possible, please specify the types of new articles produced from the recycled material?

“candidate POPs”	Types of waste recycled currently (or in the future)	Recycling rate [%]	New articles produced from recycled material
Dicofol	0	0	0
PFOA, its salts and PFOA-related compounds	Textiles? ELV	textiles very low, ELV very high	Not known
PFHxS, its salts and PFHxS-related compounds	Textiles	Very low	not known

Remarks:
the pressure to increase and find ways to textile recycling is increasing. The concentrations in textiles are, however, quite low and often reduced over the service life as surface treatment wears out.

20. Please indicate up-to-date (reference) measurement (analytical) methods for identifying the presence and levels of the listed “candidate POPs” in waste.

NA

21. Please indicate known inexpensive screening methods for identifying waste to be classified as POPs wastes due to their content of the listed “candidate POPs”.

NA

22. Please indicate any known (production) processes using dicofol, PFOA and PFHxS as well as options for the environmental management of their operation and potential related unintentional releases of these POPs into the environment.

Apparently unintentional release of PFAS occurs from open burning. Quantities not known for Finland.

II. Waste Management Options/Recycling Operations/for “candidate POPs”

23. Waste separation for dicofol, PFOA and PFHxS containing waste:

- a) How can be **distinguished** between **contaminated and non-contaminated waste**?
- b) Which **separation operations** should preferably be used **in practice to separate** contaminated from non-contaminated waste (please provide further details if available)?
- c) What should be the preferred **waste management option for the contaminated waste fraction** (please provide justification and further details if available e.g. related costs)?

a) We don't think dicofol is an issue for Finland. For PFAS, only laboratory analysis, unless there is information on e.g. AFFF composition (which is practically non-existent)

b)	Preferable separation operation	Relevant waste/candidate POP	Possible health risks for workers during separation of waste	Separation costs /ton of waste	Explanation / further information
1.					
2.					
3.					

b) Remarks: For dicofol stockpiles you could just see the label. For PFAS, difficult to see anything else by lab analysis would work

c)

Preferable waste management operation	Relevant waste/candidate POP	Possible health risks for workers during waste management (e.g. recycling)	Management costs / ton of waste	Explanation / further information
a) Destruction in high temperature	all 3		1200 EUR/t	
2.				
3.				

Remarks:

III. Concentration Limits for dicofol, PFOA and PFHxS

24. Are you aware of any existing concentration limits for dicofol, PFOA and PFHxS in waste? (please list limits individually)

No

25. Which concentration limits for dicofol, PFOA and PFHxS in waste according to the POP Regulation would you recommend? Please justify.

For dicofol 50 ppm
 For PFOA and PFHxS we have no opinion at the time

26. At which lower concentration limits for dicofol, PFOA and PFHxS in waste would you expect relevant impacts (e.g. on recycling industry)? Please justify.

Any

27. *Please indicate if, beyond the EU POP Regulation, there are any adjustments to EU legislation needed, resulting from the listing of the candidate POPs under the Stockholm Convention.*

All EC waste legislation that sets specific recycling targets (ELV-directive, waste framework directive etc, WEEE-directive, etc.) should have a general derogation that all recycling targets are calculated from the material left after removal of materials that are required to be disposed of in accordance with the POPs regulation. This amendment should apply to all POPs and not just the candidate POPs.

28. *Can you provide any other information or information sources relevant to Section II of this questionnaire on the “candidate POPs”?*

Section III – “already listed POPs”

Hexabromocyclododecane (HBCD), Polychlorinated Biphenyls (PCB), Polychlorinated dibenzo-p-dioxins and dibenzofurans (PCDD/PCDF)

29. Are the existing concentration limits in Annex IV and V of the EU POP Regulation for HBCD, PCB and PCDD/F appropriate to ensure a sufficient level of environmental and health protection or is it necessary to adjust **them (e.g. due to any notable developments such as new scientific data and technical progress, etc.)? Please justify.**

Yes, they are sufficient.

30. If the existing limit values need to be adjusted, which **concentration limits for HBCD, PCB and PCDD/F in waste would you recommend and why?**

No need. We are not in favor of adjusting HBCD limit values at the time due to analytical challenges that were acknowledged at the time of setting the values have not gone away.

31. What would be the **major impacts from a possible adjustment of existing limit values of Annex IV or V of the EU POP Regulation? Please justify.**

Amendment of the existing limit values can lead to a need to make amendments to other EC legislation.

For example, if Low-POP limit for PCB is amended there would be a need to adjust the definition of PCB in PCB-directive 96/59/EC since the definition is related to the current limit value 50 ppm (0,005 w-%). Keeping the definition in the PCB directive in line with the POP regulation is crucial for the overall coherence of legislation since for example in EU List of Waste Decision (2014/955/EU) PCB is defined by a direct reference to the definition in PCB-directive.

Additionally, the A and B waste lists of the Basel Convention use the limit value of 50 mg/kg for PCBs. Hence, the Annexes of the EC Shipment Regulation (EU) 1013/2006 might also need adjustment if the limit value of PCB is amended.