Scientific Committee on Health, Environmental and Emerging Risks
SCHEER

Scientific Opinion on "Draft Environmental Quality Standards for Priority Substances under the Water Framework Directive"

Mercury and its compounds

The SCHEER adopted this document
via written procedure on 22 December 2022

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Register of Commission expert groups and other similar entities (europa.eu)

This Opinion has been subject to a commenting period of four weeks after its initial publication (from 11 November to 12 December 2022). Comments received during this period were considered by the SCHEER. For this Opinion, there was no comment and a mistake in calculation was corrected under section 8.3 as well as in the abstract.

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ABSTRACT

The dossier on Environmental Quality Standards for "Mercury" is reviewed by the SCHEER according to the general mandate on EQS dossiers.

In the dossier some sections are the same of a previous version (2005), based on the procedures proposed in an old Technical Guidance, other section have been updated. This produces some inconsistencies. The SCHEER recommends that the full dossier should be updated.

For the QS on water the added approach is proposed, based on the following equation:

$QS_{water} = C_{background} + MPA$.

It is the opinion of the SCHEER that, due to the lack of knowledge on natural background levels in most European water bodies, the approach cannot be applied. In particular, the approach applied considering only the default values of River Rhine cannot be accepted. Considering the need for update the derived values on the basis of the more recent Technical Guidance and toxicity data, it is the opinion of the SCHEER that the proposed MPAs should be proposed as provisional QS as follows:

$MAC\text{-}QS_{fw,eco} = MAC\text{-}QS_{sw,eco} = 0.07\ \mu g\ Hg\ L^{-1}$

$AA\text{-}QS_{fw,eco} = AA\text{-}QS_{sw,eco} = 0.047\ \mu g\ Hg\ L^{-1}$

The dossier considers that, for the time being, no reliable $QS_{sediment}$ can be derived. The SCHEER agrees with this conclusion. However, it is the opinion of the SCHEER that the more recent Technical Guidance must be applied and that more efforts should be made for collecting data on sediment dwelling organisms.

The SCHEER endorses the **$QS_{biota,\ secpois,\ fw} = 11\ \mu g\ kg^{-1}{}_{ww}$**, derived with the deterministic procedure, while the SCHEER does not endorse the $QS_{biota,\ secpois,\ fw}$ derived with the probabilistic procedureand the back calculated $QS_{fw,\ sec\ pois}$due to inconsistencies in the calculations. The SCHEER endorses the **$QS_{biota,\ secpois,\ sw} = 0.36\ \mu g\ kg^{-1}{}_{ww}$** and the back-calculated **$QS_{sw,\ biota} = 0.7\ pg\ L^{-1}$**.

The SCHEER endorses the **$QS_{biota,\ hh} = 23\ \mu g\ kg^{-1}{}_{biota}$** and the back calculated **$QS_{water,\ hh\ food} = 4.6\ pg\ L^{-1}$.**

The SCHEER agrees with the decision of supporting the drinking water standard (DWS) of **1 µg Hg L^{-1}**, of the Directive (EU) 2020/2184.

Among the QSs endorsed by the SCHEER, the lowest value endorsed by the SCHEER is the **$QS_{water,\ hh\ food} = 4.6\ pg\ MeHg\ L^{-1}$**.

TABLE OF CONTENTS

1. BACKGROUND

Article 16 of the Water Framework Directive (WFD, 2000/60/EC) requires the Commission to identify Priority Substances among those presenting significant risk to or via the aquatic environment, and to set EU Environmental Quality Standards (EQS) for those substances in water, sediment and/or biota. In 2001, a first list of 33 Priority Substances was adopted (Decision 2455/2001) and in 2008, the EQS for those substances were established (Directive 2008/105/EC or EQS Directive, EQSD). WFD Article 16 requires the Commission to periodically review the list. The first review led to a Commission proposal in 2011, resulting in the adoption of a revised list in 2013 containing an additional 12 Priority Substances. Technical work to support a second review has been underway for some time, and several substances have been identified as possible candidate Priority Substances. The Commission will be drafting a legislative proposal, with the aim of presenting it to the Council and the Parliament sometime around mid-2022.

The technical work has been supported by the Working Group (WG) Chemicals under the Common Implementation Strategy for the WFD. The WG is chaired by DG Environment and consists of experts from Member States, EFTA countries, candidate countries and several European umbrella organisations representing a wide range of interests (industry, agriculture, water, environment, etc.).

Experts nominated by WG Members (operating as individual substance Expert Groups and through the Sub-Group on Review of Priority Substances, SG-R) have been deriving EQS for the possible candidate substances and have produced draft EQS for most of them. In some cases, a consensus has been reached, but in others there is disagreement about one or other component of the draft dossier. The EQS for a number of existing priority substances are currently also being revised.

The EQS derivation has been carried out in accordance with the Technical Guidance Document on Deriving EQS (TGD-EQS) reviewed by the SCHEER[1].

2. TERMS OF REFERENCE

DG Environment now seeks the opinion of the SCHEER on the draft EQS for the proposed Priority Substances and the revised EQS for a number of existing Priority Substances. The SCHEER is asked to provide an Opinion for each substance. We ask that the SCHEER focus on:

Generic questions to the SCHEER

- Have the EQS been correctly and appropriately derived, in the light of the available information and the TGD-EQS?
- Has the most critical EQS (in terms of impact on environment/health) been correctly identified?

[1] https://circabc.europa.eu/ui/group/9ab5926d-bed4-4322-9aa7-9964bbe8312d/library/ba6810cd-e611-4f72-9902-f0d8867a2a6b/details

Additional questions to the SCHEER

Additional questions to the SCHEER can be found in the file "Environmental Quality Standards Dossier 'Mercury' for the Scientific Committee on Health, Environmental and Emerging Risks (SCHEER)", otherwise they are listed below:

- Should an AF of 3 rather than 4 be applied to calculate the AA-EQS, leading to an AA-EQS_{biota} of 10.29 µg/kg $_{biota, fw}$ rather than 7.64 µg/kg $_{biota, fw}$?
- Is it possible to determine a true natural (non-anthropogenic) background for mercury, and if so, what value should be used, and in what matrix? Are mussels an appropriate matrix?

The SCHEER responds to these questions at the end of the opinion.

3. OPINION

It should be noted that in a separate synthesis opinion, the SCHEER provides an analysis of weaknesses and unresolved issues common to all dossiers. This includes a discussion of the risk assessment method and of SCHEER's concern regarding the completeness of the data used for the estimation of the different QS values.

In the disclaimer of the revised version of the dossier on Mercury (July 2022) it is explained that the document represents a revision of the previous version (January 2005), according to the Technical Guidance for EQS derivation updated in 2018 (EC, 2018) and considering new data available after 2005 for oral toxicity, bioaccumulation, and biomagnification. In particular, the biota sections 8.3 (Secondary poisoning of top predators), 8.4 (Quality standard referring to food uptake by humans), and 8.5 (Choice of the Final EQS_{biota}) have been revised. Moreover, section 2 (Existing evaluations and Regulatory information**)** has been updated according to the most recent legislation.

It is the opinion of the SCHEER that it would have been worth also revising the other section of the document, particularly in relation to the 2018 Technical Guidance, but also considering that many new aquatic ecotoxicological data have been produced since 2005 (e.g., more than 1000 new records in the US EPA ECOTOX database). Therefore, in this opinion, the SCHEER decided to also review the other sections, just to check if the requirements on the 2018 Technical Guidance have been fulfilled.

Specific comments on the different sections of the dossier are listed below.

Section 6. Effect data (aquatic environment) (EQS Dossier 2005)

In Table 6.1 acute and chronic data on aquatic organisms are reported (with some mistakes in the names of species, e.g., *Scenedesmus capricornutum* instead of *Selenastrum capricornutum*). No information is provided about the procedure and the criteria for the collection and selection of the data. Considering the huge amount of data available on mercury in the literature, it is the opinion of the SCHEER that this information would have been relevant and useful.

Section 7. Effect data (human health)

In the dossier two different tolerable weekly intake (TWI) are mentioned:

- a provisional TWI of 4 µg $kg^{-1}_{b.w.}$ for inorganic mercury (FAO/WHO 2011);
- a TWI of 1.3 µg $kg^{-1}_{b.w.}$ for methylmercury (expressed as mercury) (EFSA, 2012).

In this section, the dossier does not specify which one will be used for the assessment.

Section 8. Calculation of quality standards

For the QS in water, the added risk approach is used, that considers the maximum permissible addition (MPA) as the maximum concentration that may be added to the natural background, based on the following equation:

$$QS_{water} = C_{background} + MPA$$

In the 2018 Technical Guidance the added approach for metals is not explicitly proposed, although the need for considering the natural background to reduce uncertainty is mentioned (Section 3.5.4. of the EQS Technical Guidance).

It is the opinion of the SCHEER that, in theory, the added approach is scientifically sound and may be very relevant in water bodies where, due to natural conditions of the watershed, the natural background concentrations of metals are particularly high, producing adaptation processes in the biological community, leading to reduced sensitivity. However, in practice, the approach is very difficult to apply due to the lack of knowledge on natural background levels in most European water bodies. Moreover, it must be considered that this may produce a lack of harmonisation among QSs for metals. More specific comments will be provided in the specific sections.

Section 8.1. Maximum permissible addition (MPA) for water (EQS dossier 2005)

The terminology used is referred to an old Guidance document and is substantially different from those used in the dossiers developed according with the 2018 Technical guidance. Toxicity data

Freshwater and Transitional, coastal and territorial waters

For the AA-QS the deterministic approach is used by applying an AF of 10 to the lowest chronic NOEC, obtained for the marine coelenterate *Clavopsella michaeli* (0.1 µg L^{-1}). The same approach has been used for fresh and marine waters, considering that a large database on marine species is available. Therefore, the result is:

$$AA\text{-}EQS_{saltwater} = AA\text{-}EQS_{freshwater} = 0.01 \text{ µg Hg } L^{-1}$$

In the dossier this value is indicated as AA-EQS but, according with Section 8, it should be indicated as MPA.

Transient concentration peaks (MAC-EQS)

The MAC-EQS is derived on the basis of the lowest acute toxicity test available (8 days LC50 on *Carassius auratus* of 0.7 µg L^{-1}) by applying an AF of 10. This is justified by the

large dataset of acute test, available for a very broad spectrum of freshwater and marine taxonomic groups. Therefore, the result is:

$$MAC\text{-}MPA = 0.07\ \mu g\ Hg\ L^{-1}$$

Section 8.1.1 Calculation of the maximum permissible addition by statistical extrapolation (EQS dossier 2005)

An SSD curve is developed by combining freshwater and saltwater data from table 6.1 (18 species, 7 taxonomic groups, 8 taxonomic groups if microalgae and macroalgae are considered separately). In the table, if more data are available for the same species and same endpoint, the lowest value is selected. This is in contrast with the procedure described in the 2018 Technical Guidance that proposes a geometric mean.

A 5P-COV (5Percentile Cut Off Value, corresponding to the HC5) of 0.142 µg L^{-1}, is calculated. The value is very close to the HC5 values obtained using only freshwater or only saltwater chronic data.

An AF of 3 is used to derive a probabilistic MPA:

$$MPA_{water.SSD} = 0.047\ \mu g\ Hg\ L^{-1}$$

As the log $Kp_{Water\text{-}SPM}$ is >3, the QS for water is additionally given as concentration in SPM. The Kp-value reported as mean value in the river Rhine is used as *example* for the calculation (Kp (mean, Rhine) ≈ 100,000 L kg^{-1}):

MPA_{SPM} [mg kg^{-1}] = MPA_{water} (0.047 µg Hg L^{-1})*Kp (100,000 L kg^{-1}) = 4.7 mg Hg kg^{-1} SPM

Section 8.1.2 Calculation of the water quality standards (EQS dossier 2005)

Freshwater and saltwater

The water quality standard is calculated using the added approach by assuming, as an example, the natural background concentration of Hg in the river Rhine (0.005 µg Hg L^{-1} in water and 0.2 mg Hg kg^{-1} in suspended sediments).

The example of a quality standard for the Rhine is calculated on the basis of the background concentration in the Rhine and the MPA as calculated in section 8.1.1:

QS_{water} = $C_{background}$ (0.005 µg Hg L^{-1}) + MPA (0.047 µg Hg L^{-1}) = 0.052 µg Hg L^{-1}

For the Rhine as example, the QS for mercury in SPM is therefore calculated as follows:

QS_{SPM} = $C_{background}$ (0.2 mg kg^{-1}) + MPA_{SPM} (4.7 mg kg^{-1}) = 4.9 mg Hg kg^{-1} SPM

Quality standard for transient concentration peaks (MAC-QS)

The MAC-QS is calculated on the basis of the background concentration (0.005 µg Hg L^{-1}, see section on QS for freshwater and saltwater above) and the MAC-MPA as calculated in section 8.1:

MAC-QS = $C_{background}$ (0.005 µg L^{-1}) + MAC-MPA (0.07 µg L^{-1}) = 0.075 µg Hg L^{-1}

Final EQSs for freshwater and saltwater

It is the opinion of the SCHEER that the EQS cannot be calculated using the added approach without a sufficient knowledge on the background concentrations in European waterbodies. The example proposed in the dossier using the Rhine background concentrations cannot be generalised.

It is the opinion of the SCHEER that the calculated MPAs could be proposed as provisional QSs.

Therefore, the SCHEER, using the terminology of the 2018 Technical Guidance, proposes:

$MAC\text{-}QS_{fw,eco}$ = $MAC\text{-}QS_{sw,eco}$ = 0.07 µg Hg L^{-1}.

$AA\text{-}QS_{fw,eco}$ = $AA\text{-}QS_{sw,eco}$ = 0.047 µg Hg L^{-1}

However, it is the opinion of the SCHEER that these QSs should be revised following the procedures proposed by the 2018 Technical Guidance and improving and updating the acute and chronic databases, on the basis of transparent selection criteria.

Moreover, the SCHEER suggests evaluating the possibility of using the BLM (Biological Ligand Model) approach in order to develop QSs based on the bioavailable concentration of metal, as strongly supported by the 2018 Technical Guidance.

Section 8.2 Quality standard for sediment (EQS dossier 2005)

In absence of toxicity data for sediment dwelling organisms, the QS for sediments is calculated using the equilibrium partitioning method.

The Kp of the Rhine (Kp 100,000 L kg^{-1}) is used as an example and an additional AF of 10 is considered in order to account for the exposure pathways other than pore water (sediment ingestion, contact). The calculation is made using the $MPA_{water.SSD}$=0.047 µg L^{-1} with the following equation:

$MPA_{sediment}$ [µg kg^{-1} SPM]=Kp (100,000 L kg^{-1}) * MPA_{water} (0.047 µg L^{-1})/10 = 470 µg kg^{-1}

Then, the QS for sediments is derived by applying the added approach, using the background concentration in Rhine sediment is 0.2 mg Hg kg SPM^{-1}, obtaining the following QS:

$QS_{sediment.rhine}$ = $C_{background}$ (200 µg kg^{-1}) + MPA (470 µg kg^{-1}) = 670 µg Hg $kg^{-1}{}_{dw}$

Furthermore, the dossier reports one chronic toxicity test with the sediment dwelling larvae of the insect *Chironomus riparius* available (28d NOEC = 930 mg kg^{-1} sediment). By applying an AF of 100, a tentative $QS_{sediment}$ of 9.3 mg Hg kg^{-1} sediment dw is derived.

The dossier concludes that both QS must be considered as tentative and, for the time being, no reliable $QS_{sediment}$ can be derived.

On the basis of the information provided in the dossier, the SCHEER agrees with this conclusion.

However, it is the opinion of the SCHEER that there is the need for using more updated information. First, more efforts should be made looking for more data on sediment dwelling organisms (for example, in the US EPA ECOTOX database, more than 100 records are reported on *Chironomus* larvae). Second, the equilibrium partitioning approach should be applied using the procedures proposed in the 2018 Technical Guidance (for example using a more general, modelling-based, Kp value instead of a specific value such as the Kp of Rhine).

Section 8.3 Secondary poisoning of top predators

This is one of the sections that have been recently revised according to the Technical Guidance for EQS derivation updated in 2018 (EC, 2018) and considering new data available after 2005.

In the main text a table of toxicity data is reported, including 8 values on mammals and 14 values on birds. These data are selected from a more extensive table reported in the Annex (Table 10.1) but the criteria for the selection are not described. It must be noted that most selected data, in particular all data on mammals, derive from a RIVM report published in 2000, not after 2005.

The lowest value is the NOEL of 0.011 mg kg^{-1}_{bw} day^{-1} of methylmercury from a monkey study, and it is used for the derivation of biota standards. This value is the same that was selected in the mercury EQS dossier from 2005. It must be noted that in the table all values are indicated as mg kg^{-1}_{ww}. In particular, for the monkey experiment, two values are reported: NOEC = 0.22 mg kg^{-1}_{ww} (reasonably referred to a concentration in the diet) and NOEL: 0.011 mg kg^{-1}_{ww} day^{-1} (reasonably a mistake to indicate 0.011 mg kg^{-1}_{bw} day^{-1}, as indicated in the text and in table 10.1 in the annex). Anyway, this may create confusion.

The method followed in the dossier, according to the EQS Technical Guidance (EC, 2018), in the case of toxicological endpoint expressed as diet concentration, is based on energy normalised diet concentrations.

The daily energy expenditure (DEE) is calculated with the following equation using a value of 5500 g for the body weight of monkeys:

$$\log DEE\ [kJ\ d^{-1}] = 0.8136 + 0.7149 * \log bw\ [g]$$

obtaining a value of DEE = 3073.16 kJ d^{-1}.

The NOEL of 0.011 mg kg^{-1}_{bw} day^{-1} is then normalised to the energy content of food according to the following equation:

$$C_{energy\ normalised}\ [mg\ kJ^{-1}] = dose * (bw\ [kg]/DEE)$$

obtaining a value of $C_{energy\ normalised} = 2.0 \times 10^{-5}$ mg kJ^{-1}or 0.020 µg kJ^{-1}.

The concentration in a specific food item is calculated with the following equation using the energy contents of 21 kJ g^{-1}_{dw} (in the dossier is erroneously written 21 kJ kg^{-1}) on a dry weight basis for fish and a moisture fraction of 73.7%, according with the 2018 Technical Guidance:

$C_{food\ item}$ [mg kg_{ww}^{-1}] = $C_{energy\ normalised}$ [mg kJ^{-1}] * energy $content_{food\ item,\ dw}$ * (1-moisture $fraction_{food\ item}$)

The resulting $C_{food\ item}$ value is 0.11 mg kg_{ww}^{-1} for fish. It is the opinion of the SCHEER that the calculation is correct.

According to the Technical Guidance, an AF of 10 is applied to derive a final **$QS_{biota,\ secpois,\ fw}$ = 0.011 mg kg^{-1}_{ww}** or **10.87 µg kg^{-1}_{ww} (rounded to 11 µg kg^{-1}_{ww}) for fish.** The SCHEER endorses the $QS_{biota,\ secpois,\ fw}$.

For the back-calculation to water concentration, a BAF of 4.9×10^6 L kg_{ww}^{-1}, taken from a RIVM (2015) report, is used. The BAF value is very high. However, it derives from a scientifically sound RIVM report that indicates this value as the BAF of methylmercury (MeHg) for top predators (Trophic Level TL>4.5). It is the opinion of the SCHEER that this value can be accepted for a worst-case scenario.

From these values, a $QS_{fw,sec\ pois}$ for fish equal to 2.08×10^{-9} mg L^{-1} or 3.81 pg L^{-1} is calculated. It is the opinion of the SCHEER that the calculation is wrong. Moreover, it is unclear why 2.08×10^{-9} mg/L may correspond to 3.81 pg/L. Therefore, the SCHEER cannot endorse the $QS_{fw,\ sec\ pois}$.

For the marine environment, a separate calculation is applied based on the assumption that top predators also have to be taken into account. According to the standard procedures of the Technical Guidance, a $QS_{biota,\ sec\ pois,\ sw}$ in fish should be calculated using the following equation:

$$QS_{biota,secpois,sw}\ [mg\ kg^{-1}] = (lowest\ chronic\ value/AF*BMF_{b/m})*((lipid/dry\ weight\ fraction_{fish})/(lipid/dry\ weight\ fraction_{b/m}))$$

In the dossier this equation (equation 5) is wrongly written.

The calculation is performed using a BMF of 20 kg_{dw} kg^{-1}_{dw}. The reference for this very high BMF is not reported. The calculated **$QS_{biota,\ secpois,\ sw}$ is 0.36 µg kg^{-1}_{ww}** for fish. Finally, the back-calculation to water performed with the BAF of 4.9×10^6 leads to a **$QS_{sw,\ biota}$ for fish = 0.07 pg L^{-1}**. The SCHEER endorses the QSs.

A probabilistic approach is also developed using 4 mammalian species and 9 bird species, including wildlife predatory species. According with the Technical Guidance, the dataset is suitable.

At page 20 of the dossier, it is stated:

"However, before constructing the SSD, a normalisation to the energy content was performed. Endpoints expressed as daily dose were normalised according to the method A reported in the EQS TGD (EC, 2018) (10.1 Annex I). Otherwise, if the endpoints were expressed as diet concentration, the normalisation was performed according to the Method B reported in the EQS TGD (EC, 2018) (Table 10.1.2). The lowest $C_{food\ item}$ per species was selected for further calculations. "

In these sentences there are many inconsistencies that made difficult follow the calculation:

- Table 10.1 of Annex 1 does not report normalised data;
- Table 10.1.2 does not exist; data normalised according to method B are reported in table 10.2.1 of Annex II. Data normalised according to method A do not appear in any table; probably, they do not exist because in table 10.2.1. 13 values are reported, as those used for the SSD curve;
- It is not true that the lowest $C_{food\ item}$ per species was selected; for example, for *Mustela vison*, values of 0.414 and 0.994 mg kg^{-1}_{ww} are reported, while a value of 1.192 mg kg^{-1}_{ww} is selected.
- Many of the non-normalised data of Table 10.2.1 do not correspond to the data reported in the table at pages 17-18 of the main text; it is unclear how these data have been selected.

Moreover, the normalised data reported in table 10.2.1 do not correspond to the data of figure 8.3.1 (SSD curve). The origin of these data is unclear.

Considering all these inconsistencies, it is the opinion of the SCHEER that the probabilistic approach cannot be accepted in the present form.

Choice of the final $QS_{biota,\ secpois}$

Although the SCHEER is of the opinion that the probabilistic approach should be, in general, preferred to the deterministic one, in this case the application of the probabilistic approach is not endorsed by the SCHEER due to many inconsistencies.

Therefore, the deterministic **$QS_{biota,\ secpois,\ fw}$ = 11 µg kg^{-1}_{ww}** is selected by the SCHEER.

Due to mistakes in the calculations, it is the opinion of the SCHEER that the $QS_{biota,\ secpois,\ sw}$ and the back calculated $QS_{fw,sec\ pois}$ and $QS_{sw,sec\ pois}$ cannot be proposed.

Section 8.4 Quality standard referring to food uptake by humans

In the dossier this section is quite confuse, mixing parts of the old (2005) dossier and parts updated, sometimes in contradiction. For example, at page 22 it is stated:

"*As shown in the section about secondary poisoning, large uncertainties do exist about bioaccumulation of mercury in aquatic food webs. Therefore, it is concluded that it is for the time being not possible to calculate a reliable* $QS_{hh.water}$*.* "

However, in the section, a BAF is used, as in section 8.3, and the $QS_{hh.water}$.is calculated.

According to EFSA (2012), a TWI of 1.3 µg kg^{-1}_{bw} for methylmercury (expressed as mercury), corresponding to a TDI of 0.1857 µg kg^{-1}_{bw} day^{-1}, is selected for the calculation of the QS.

The $QS_{biota,\ hh}$ is calculated with the following equation:

$$QS_{biota,\ hh} = (0.2*TL_{hh})/0.00163$$

Where:

• 0.2 = default fraction of TL_{hh} related to fishery products consumption

• TL_{hh} = threshold limit from mammalian studies (ADI or TDI) (mg kg^{-1}_{bw} d^{-1})

• 0.00163 (kg_{fish} kg^{-1}_{bw} d^{-1}) = estimated daily fishery products consumption (default 0.115 kg d^{-1}) per kg body weight (default 70 kg).

The resulting **$QS_{biota,\ hh}$ = 22.79 µg kg^{-1}_{biota}.** (to be rounded to **23 µg kg^{-1}_{biota}**). The calculation is correct. The SCHEER endorses the QS.

The back calculation is performed by dividing the $QS_{biota,\ hh}$ by the BAF of 4.9 x 10^6 L kg^{-1}_{ww} (although not explicitly mentioned). This led to a **$QS_{water,\ hh\ food}$= 4.6 pg MeHg L^{-1}** corresponding to 77 pg THg L^{-1}. The SCHEER endorses the methylmercury (MeHg) QS. However, it must be noted that in the dossier the procedure to convert MeHg into total mercury (THg) is not described. Therefore, the THg is not endorsed.

Section 8.5 Choice of the Final EQSbiota

As in section 8.3, this section supports the selection of the probabilistic $QS_{biota,\ secpois,\ fw}$ of 10.29 µg kg^{-1}_{ww} and $QS_{biota,\ secpois,\ fw}$ of 0.257 µg kg^{-1}_{ww}. Both QSs are not endorsed by the SCHEER.

Section 8.6 Quality standard for drinking water abstraction

The dossier supports the drinking water standard (DWS), set in Directive (EU) 2020/2184, of **1 µg Hg L^{-1}**, and notes that MAC-QS_{eco} derived for the protection of the freshwater community (0.07 µg Hg L^{-1}) is by far lower than the DWS.

The SCHEER agrees with this position.

4. CRITICAL EQS

The lowest value endorsed by the SCHEER is the **$QS_{water,\ hh\ food}$= 4.6 pg MeHg L^{-1}**. It must be considered that many QS have not been endorsed by the SCHEER.

5. SCHEER RESPONSES TO ADDITIONAL QUESTIONS PUT BY THE COMMISSION

- Should an AF of 3 rather than 4 be applied to calculate the AA-EQS, leading to an AA-EQS_{biota} of 10.29 µg/kg $_{biota,\ fw}$ rather than 7.64 µg/kg $_{biota,\ fw}$?

Referring to the QS for water, it is the opinion of the SCHEER that the AA-$QS_{fw,eco}$ based on the probabilistic approach should be accepted as provisional, and that it should be revised following the procedures proposed by the 2018 Technical Guidance and improving and updating the acute and chronic databases. A sounder discussion on the most appropriate AF to be used, could be made on an updated SSD curve.

Referring to the QS for secondary poisoning, the probabilistic approach is not endorsed by the SCHEER due to many inconsistencies.

- Is it possible to determine a true natural (non-anthropogenic) background for mercury, and if so, what value should be used, and in what matrix? Are mussels an appropriate matrix?

The only biota standard endorsed by the SCHEER is the deterministic **$QS_{biota,\ secpois,\ fw}$ = 11 µg kg^{-1}_{ww}**.

In the dossier some values of mercury concentration in molluscs from German marine coastal waters are reported in section 8.5.

The reported values spanned between 0.6 µg kg^{-1}_{ww} and 9.7 µg kg^{-1}_{ww}. There are not enough elements for judging it these values may be considered as natural background concentrations, that should be characteristic for pristine areas. Therefore, it may be reasonably confirmed that the biota standard is above natural background concentrations.

6. LIST OF ABBREVIATIONS

AA-QS	Annual Average Quality Standard
AF	Application Factor
BAF	Bioaccumulation Factor
BLM	Biotic Ligand Model
BMF	Biomagnification Factor
COV	Cut Off Value
DEE	Daily Energy Expenditure
EQS	Environmental Quality Standards
HC5	Hazardous Concentration for 5% of the species of a community
MAC-QS	Maximum Acceptable Concentration Quality Standard
MeHg	Methyl Mercury
MIC	Minimum Inhibitory Concentration
MPA	Maximum Permissible Addition
NOAEL	No Observed Adverse Effect Level
NOEC	No Observed Effect Concentration
NOEL	No Observed Effect Level
QS	Quality Standard
SPM	Suspended Particulate Matter
SSD	Species Sensitivity Distribution
TDI	Tolerable Daily Intake
THg	Total Mercury
TL	Threshold Limit
TWI	Tolerable Weekly Intake

7. REFERENCES

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