



Document title	Proposals and comments by countries with remaining study reservations on the Metal indicator GES boundary
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Agenda Item	2 - Development of a proposal for the core indicator 'Metals' GES boundary
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Submitted by	Poland, Sweden
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Background

The HELCOM Heads of Delegation 50-2016 meeting (paragraph 4.48) agreed to the proposed GES boundary for, among others, the core indicator 'Metals' pending the following study reservations:

- a general study reservation by Germany;
- a study reservation by Poland on the GES boundaries for Cd and Pb in offshore assessment units;
- a study reservation by Sweden on the use of the proposed GES boundaries for Cd and Pb in offshore assessment units under Descriptor 8;
- a study reservation by Denmark on proposed GES boundaries that are not environmental quality standards derived from EU directives or nationally agreed environmental quality standards.

HOD 50-2016 further recognized the need to reach clarity regarding the use of indicators in HOLAS I and urged the Contacting Parties with study reservations to clarify their positions as soon as possible (paragraph 4.49).

The third meeting of the HELCOM Expert network on hazardous substances (EN-HZ 3-2016) discussed the remaining study reservations on the 'Metals' core indicator GES boundary. The meeting agreed that countries should proceed with developing written proposals and comments on the core indicator 'Metals' GES boundary. The meeting concluded that comments should be received by 16 September in order to circulate them in the group in advance of the next meeting.

This document presents the proposals and comments received by the submission dead line by Poland and Sweden.

Action required

The Meeting is invited to take note of the information and use it to develop a proposal for the core indicator 'Metals' GES boundary to be submitted to STATE & CONSERVATION 5-2016.

Polish comments and proposals for Pb and Cd GES boundaries for fish

Extracted from HELCOM documents: Table 1. Core indicators for which GES boundaries have been agreed, noting countries with study reservations in place on the GES boundaries.

Core indicators	GES boundary			Source	Clarifying comment	Study reservation in place on GES boundary
Metals	Cd	Coastal assessment unit	0.2 µg/l	EQS water (AA)		
			<i>Secondary GES boundary:</i> 2.3 mg/kg dw sediment 960 µg/kg dw blue mussel	QS BAC		
		Offshore assessment unit	50 µg/kg ww fish muscle 1000 µg/kg ww mussels	EC 1881/2006		
	Pb	Coastal assessment unit	1.3 µg/l	EQS water (AA)		
			<i>Secondary GES boundary</i> 120 mg/kg dw sediment 1300 µg/kg dw blue mussel 26 µg/kg dw fish	QS BAC BAC		
		Offshore assessment unit	300 µg/kg ww fish muscle 1500 µg/kg ww mussels	EC 1881/2006:		
	Hg	20 µg/kg ww		EQS biota secondary poisoning		

Polish comments for Cd and Pb in fish:

The proposed changes of GES boundaries for Cd and Pb in fish liver has consequences, which in my opinion does not permit the application of the proposed value in assessment of the state of the Baltic Sea environment:

1. The application of new GES boundaries requires the conversion of data, Pb and Cd are analyzed in fish liver by all Contracting Parties, and such results are delivered to the data base. Data on Pb and Cd in fish muscle is very limited.
2. Each calculation has to be based on the conversion factors or conversion equations which may generate errors and large uncertainty. This is especially when for correlations development the values below the limits of quantification are used, what is the case of concentrations of Pb and Cd in fish muscles.
3. And finally when we use conversion factors or equations for calculation Pb and Cd concentrations in fish muscle and we combine these results with new GES boundaries for Pb and Cd in fish muscle used for human health protection it is almost certain that we obtain good environmental status in all areas regarding Pb and Cd in fish. Moreover adoption of new GES boundaries and the use of conversion factors will lead us to a state of not only good, but perfect. So what is the state of the environment?

By using the proposed GES boundaries and conversion factors, we do not need no longer apply any assessment tools.

Summary of proposed GES boundaries from different sources:

Pb	Cd	Source	Polish comment
26 µg / kg ww liver	26 µg / kg ww liver	OSPAR BAC	
300 µg/kg ww fish muscle	50 µg/kg ww fish muscle	EC 1881/2006	Not acceptable: Conversion needed Cause the drastic change of status
50 µg / kg ww liver	300 µg / kg dw liver	Environmental Quality Standards – Report 5051, Swedish Environmental Protection Agency	More reasonable
1500 µg / kg ww liver	1000 µg / kg ww liver	EC values for Cd and Pb in bivalve molusc recommended for Cd and Pb in fish liver Background document on CEMP assessment criteria for the QSR 2010	Not acceptable: Cause the drastic change of status
26 µg / kg ww liver = OSPAR BAC	260 µg / kg ww liver	Polish result evaluation: 35 year data record 15th pcentile	Polish proposal

Polish comments for Cd and Pb in mussel:

1. What is the reason for applying two different GES boundaries values for the same organisms occurring in different areas (offshore and coastal. Are there any ecotoxicological for the use of two such different values. So far, the GES border for Cd was 960 µg / kg dw, now is 1,000 µg / kg ww which in fact corresponds to the value 10,000 µg / kg ww when we covert it to the dry weight. This change the status in the drastic way. The same situation is observed for Pb.

Polish recommendation:

To use the GES boundaries for the costal areas also in the offshore areas, that are:

960 µg / kg dw for Cd

1300 µg / kg dw for Pb

The Swedish view on the threshold levels proposed for the core indicator 'Metals'

The current Swedish study reservation on the proposed threshold values only concerns the use of the proposed levels of **Cd and Pb in fish tissue** to assess status of descriptor 8 in the open sea as these are based on EC food limits.

The Swedish Environmental Protection Agency's view is that a threshold that is used to assess the environmental status according to descriptor 8 should aim to protect both the environment and human health. A food limit threshold can therefore be used in cases where this limit is also expected to protect the environment. Thus food limits in fish muscle can be accepted for Cd and Pb also for assessing good environmental status for D8 if these values are sufficiently protective also for predators who could be affected by secondary poisoning.

For Pb the EC food limit in fish muscle is 300 µg/kg ww and the value proposed in the WFD dossier to be protective of secondary poisoning, $QS_{\text{secpois.biota}}$, is (300) 1000 µg/kg ww food, that is the value is similar to the level of the food limit. However, that value is based on concentrations in the whole body. Pb enriches in the liver, which means that the concentration in the whole body could be higher compared to muscle tissue. The Swedish Museum of Natural History has developed preliminary conversion factors between the whole body, liver and muscle of metals in fish, but the study found no clear correlation between the concentrations of Pb in the different organs so *further studies are needed*.

For Pb in fish in coastal waters there is also a secondary threshold for fish; the 26 µg/kg dry weight of fish adopted (in document STATE 4J6 -GES boundary proposals for Hazardous Substances). This is derived from the OSPAR BAC (Background Assessment Criteria). According to OSPAR, however, this BAC (26 µg/kg should be for fish liver and wet weight. According to a footnote in the document this BAC is a proxy-BAC determined at a meeting of the previous OSPAR group MON in 2007.

See document

http://qsr2010.ospar.org/media/assessments/p00390_supplements/p00461_Background_Doc_CEMP_Assessment_Criteria_Haz_Subst.pdf

Also to assess how the various biota values for Pb in fish tissues relate to each other would further conversion factor studies are needed. The SEPA intends to finance such studies during 2016-2017.

For Cd the EC food limit of 50 µg/kg ww in fish muscle is proposed as the threshold for evaluating biota in the open sea.

In the priority substance dossier for Cd, there is no $QS_{\text{secpois.biota}}$ proposed for the marine environment because of lack of information on bioaccumulation of Cd in the marine environment. Older studies suggest Cd-dependent toxicity for seabirds at lower levels than in the freshwater environment. For freshwater environment, the value is 0.16 mg/kg food ww ie 160 µg/kg ww. There are no conversion factors between fish muscle and whole body for Cd. For this reason, it is questionable whether the proposed limit of Cd can also be used for the assessment of the environmental status of the Descriptor 8.

This being said and as the results of the new studies on conversion factors for Cd and Pb between different fish tissues will not be ready for use until late 2017 at the earliest Sweden can agree to the tentative use of the BAC for Pb in fish liver to assess status both in coastal and offshore areas and similarly we would suggest using the OSPAR BAC for Cd in fish liver (also 26 µg/kg ww fish liver) for assessing Cd status.

Moreover, we are of the opinion that the secondary thresholds already adopted for the concentrations of Pb and Cd in sediments in coastal waters should also be applied to the open sea.