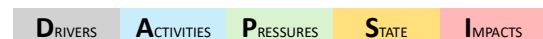


# 17b-estradiol

(CAS numbers: e.g. 50-28-2, EC number: 200-023-8  
/ Entry number in HELCOM list of priority substances: 1)

General sectors: *Hormone,  
pharmaceutical, industry*



## Why a HELCOM priority?

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### Main evidence

**P** Approximately **26-61 kg of 17b-estradiol** are estimated to enter the Baltic Sea every year, mainly via rivers and Wastewater Treatment Plants (WATERBASE<sup>1</sup>; Undeman et al, 2022<sup>2</sup>). Given that the substance is **persistent** and **extremely toxic**<sup>3</sup>, current inputs are likely significant, in terms of risk they pose for the Baltic Sea and its ecosystem services. The data used for the riverine part of the estimation (WATERBASE) concerns only measurements in the proximity of river mouths, and the period 2015-2022. The 13 subcatchment areas for which there was such riverine data reflected 14 % of the total riverine flow to the Baltic Sea, to which inputs have been extrapolated. The data in WATERBASE included approximately 6 countries and 92 samples.

**I** Current inputs to the Baltic Sea indicate potential negative impacts at least on pelagic biota.

### Supporting evidence

**I** 17b-estradiol is considered to have an **especially concerning mode of toxicity**. For example, it is an endocrine disruptor<sup>4</sup> and toxic for reproduction<sup>5</sup>. Endocrine disruptors mimic or interfere with hormones and can cause developmental abnormalities, reproductive dysfunction, and population effects.

### Overall assessment

When assessing current levels in the Baltic Sea (no relevant measurement data due to difficult chemical analysis), current inputs, and the severity of the relevant toxicity mechanism, 17b-estradiol scores **44-95/100** in the scale established for assessing the overall risk for impacts/threat for the Baltic Sea, where 50 indicates concern, 100 extreme risk, and the width of the span outlines the uncertainty in the assessment.

## Facts relevant for management considerations

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### Causal chain and pathways

**A** 17b-estradiol is a natural estrogen, which is excreted by humans as well as animals. It is also sold as a pharmaceutical. Furthermore, it is used in the EU in industrial settings as an intermediate in synthesis.

**P** Based on available estimations<sup>1,2</sup>, riverine and direct inputs to the Baltic Sea are of similar order of magnitude. The contribution of direct releases was calculated as a percentage of the total WWTP discharges estimated by Undeman et al. study.

### Relevant policies (existing or planned measures)

**M (on A/P)** • Listed in the first and second **EQSD Watch Lists**. And also as priority substance in the EC proposed Directive amending WFD and EQSD.

## References:

1. 2. 3. 4. 5. [Note: Listing of detailed references will be provided in an upcoming update of the fact sheet – for a listing of the most common references among the different substances see the section at the end of the consolidated document which includes all the fact sheets]