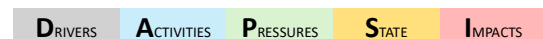


# Chlorpyrifos

(CAS numbers: e.g. 2921-88-2, EC number: 220-864-4  
/ Entry number in HELCOM list of priority substances: 8)

General sectors: Industry and commercial products?, legacy pesticide



## Why a HELCOM priority?

### Main evidence

**S** Concentrations of Chlorpyrifos exceed the applied threshold value in **1** of the 5 examined areas (assessment units) of the Baltic Sea. This is an off-shore area. In this 1 area, all samples in **water** that was possible to evaluate exceed the threshold value, noting also several inconclusive, in terms of exceedance, non-detections (due to a relatively high limit of detection)\*. This is based on monitoring data for the period 2015-2024 available in national and international databases<sup>1</sup>. A total number of 41 data points were possible to evaluate for Chlorpyrifos.

By further considering how much above or below the threshold each concentration is, and how often the substance is detected, Chlorpyrifos scores **7.5/10** (confidence range: **3.7 – 7.8**) in the scale established when assessing the criticality/significance of current levels in the Baltic Sea pose, where 5 indicates concern and 10 extreme risk, and the range reflects the level of reliability and representativeness of concentrations and the thresholds.

The threshold value for Chlorpyrifos, for water, was acquired from the EC proposed Directive amending WFD and EQSD<sup>2</sup>.

**I** Current levels in the Baltic Sea indicate potential negative impacts on pelagic biota.

**P** Approximately **9-36 kg of Chlorpyrifos** are estimated to enter the Baltic Sea every year, mainly via rivers (WATERBASE<sup>3</sup>). Further riverine emissions (and any atmospheric deposition) are possible. Historical inputs have been higher. Given that the substance is **suspect as very persistent and is extremely toxic**<sup>4</sup>(according to the EU WFD/EQSD update proposal, it also tends to accumulate in sediment and/or biota<sup>5</sup>), even current inputs are likely significant, in terms of risk they pose for the Baltic Sea and its ecosystem services. The riverine data used for the estimation concerns only measurements in the proximity of river mouths, and the period 2015-2022. The 25 subcatchment areas for which there was such riverine data reflected 20 % of the total riverine flow to the Baltic Sea. The data in WATERBASE included approximately 7 countries and 2103 samples.

### Supporting evidence

**I** Chlorpyrifos is considered to have an especially **concerning mode of toxicity**, as it affects an essential physiological process: nervous system signaling. It is an Acetylcholinesterase (AChE) inhibitor, that can affect the enzyme involved in nerve transmission causing paralysis and death in marine organisms<sup>6</sup>.

### Overall assessment

When assessing current levels in the Baltic Sea, current inputs, and the severity of the relevant toxicity mechanism, Chlorpyrifos scores **60-79/100** 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

### Causal chain and pathways

**A** No significant activities expected at least in the EU, as it neither authorized as an active substance as Plant Protection Product. Nor is with a valid EU REACH registration: The substance was REACH-registered earlier, however since 2020 the registration is no longer valid<sup>7</sup>. On the other hand, there are about 250 Classification & Labelling notifications under the EU CLP Regulation<sup>8</sup>. Therefore manufacture/import (accordingly use) in unknown amounts of less than a tonne/year per manufacturer/importer is likely the case.

**P** The riverine emissions mentioned above refer to the period 2015-2022. Therefore, they may be linked with earlier REACH-registered uses, until 2020. According to expert information provided, in Latvia and Germany the substance is monitored but not detected above the Limit Of Quantification in rivers.

### Relevant policies (existing or planned measures)

**M (on A/P)**

- Listed as a priority substance under the **EU WFD**. And as a priority hazardous substance in its update proposal. The EQSD update proposal also includes an EQS for total of active substances in pesticides, including their relevant metabolites, degradation and reaction products. Respective national **Programmes of Measures for this** are relevant.
- As mentioned above, under the EU Regulation 1107/2009 concerning the placing of **plant protection products on the market it is not authorized as active substance** (withdrawal of authorizations in 2020).

### References:

1. 2. 3. 4. 5. 6. 7. 8.

[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]

| \* considering the inconclusive non-detections, it is possible that the actual frequency of exceedance in this area is considerably lower.