

## 8.2 Quality standard for sediment

Koc values between approximately 320 and more than 1,500,000 have been reported (see section 5 of this data sheet), resulting in log  $K_{p_{susp}}$  values between 1.5 and 5.2 (see footnote 1). Hence, the trigger for the derivation of a sediment quality standard is met, although not unequivocally.

According to the Manual (sections 4.3.2.3 and 4.3.2.4) <sup>[4]</sup>, the  $PNEC_{sediment}$  ( $\approx QS_{sediment}$ ) may be calculated using the equilibrium partitioning method in the absence of toxicity data for sediment dwelling organisms.

The equilibrium partitioning approach only considers uptake via the water phase. However, uptake may also occur via other exposure pathways like ingestion of sediment and direct contact with sediment. There is evidence from studies in soil that the proportion of the total dose remains low for chemicals with a log Kow up to 5. The log Kow of tributyltin is <5 (see section 5 of this data sheet). Therefore, exposure routes other than direct uptake via the water phase need not to be considered and the  $QS_{sediment}$  is calculated as follows:

$$QS_{sed.wet.weight} [mg.kg^{-1}] = \frac{K_{p_{SPM-water}} [27 m^3/m^3]}{bulk\ density_{SPM.wet} [1,150 kg/m^3]} * 1,000 * QS_{water} [mg/l]$$

with:

$$K_{SPM-water} = f_{solid} (0.1) * K_{p_{susp}} (108 l/kg) / 1,000 * RHO_{solid} (2,500 kg/m^3) = 27 m^3/m^3 \text{ (sect 2.3.5 of [3])}$$

$$bulk\ density_{SPM.wet} = 1,150 kg/m^3$$

$$1000 = \text{conversion factor } m^3/kg \text{ to } l/kg$$

$$QS_{water} = 0.0000002 mg/l$$

The TGD defines wet SPM as 90% vol/vol water (density 1 kg/l) and 10% vol/vol solids (density 2.5 kg/l), thus giving a wet density of  $(0.9 \times 1) + (0.1 \times 2.5) = 1.15 kg/l$ . The dry weight of solids is therefore 0.25 kg (per litre wet SPM) and thus the wet:dry ratio is  $1.15/0.25 = 4.6$ .

This results in the following quality standards for sediment (wet and dry weight):

$$QS_{sediment.water} \quad 0.0046 \mu g/kg \text{ (wet wt)} \quad 0.02 \mu g/kg \text{ (dry wt)}$$