

Sediment and Biota Guideline of the WFD

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Introduction:

Within the Water Framework Directive (WFD) of the EU monitoring programs are realized in the whole water phase (dissolved - < 0.45 µm - and particle associated). For monitoring the particle-associated and bioaccumulative contaminants the Chemical Monitoring Activity (CMA) got the mandate for 2007-2009 to propose a guideline for the chemical monitoring in sediments and biota (benthos organisms) to accomplish the WFD. This guideline will cover all freshwater ecosystems, the transitional waters and the open sea.

Results and Discussion:

The guideline assist in preliminary sampling to set up the final program.

The monitoring will be applied on representative locations for the water body or clusters of water bodies, understanding the hydrological and geomorphological characteristics and pollution sources. These informations are to be deduced from earlier studies, current monitoring programs or dedicated surveys.

(Net) Deposition areas are the accumulation locations for soft sediments with relatively high amounts of fine materials (< 63 µm).

These are found in rivers and estuaries close to the bank sides not influenced by river bank erosion, in lakes and reservoirs in the central deeper parts and in coastal waters with high tidal currents in bays. These areas offer the opportunity to perform the trend analysis at the same location.

Situations/areas excluded are the absence of fine grained sediments and intermittent water flow conditions resulting in no sediment accumulation of fine grained material.

The representative area shall be characterized by in minimum 3 sampling locations or more. There is no need to arrange an even distribution along the river section. In cases where no change take place, less sampling sites are sufficient. At each sampling location 3 – 5 independent samples are taken and composite samples reduce the analytical costs. During each sampling campaign the top 5-10 cm will be collected to analyze the actual degree of contamination of the benthos habitat and for trends within the water body.

The WFD sets up a time framework of 6 years, the annual sampling might be sufficient to extract trends within the given time frame. For lakes and transition zones the frequency might be extended to every 3 – 6 years. In cases of severe fluctuations in contamination the frequency has to be increased or pooled samples are to be analyzed. Flood events are to be taken into account as separate samples.

As sediments and suspended particulate matter (SPM) are food sources the sampling of SEPM/SPM (SEPM = settling particulate matter) is a possible alternative for sediment sampling. The analysis for trace metals and organic compounds will be performed in the < 63 µm fraction with additional normalizing parameters like TOC, Li and Al. The latter are intended especially for the transition zone. Additionally, the guideline covers the sampling for nutrients. The local trace metal background has to be included in the sampling organization to perform retrospective analyses back to the pre-industrial area. The actual discussion on sediment monitoring includes the opportunity to perform the monitoring alternatively on settling particulate matter (SEPM) by means of passive sampling devices or on suspended particulate matter (SPM) by means of flow-through centrifuges. The differentiation between SEPM and SPM is mainly for the transition zone and marine area where the dynamic exchange between sediment and SPM is incomplete if all. For the WFD water samples with more than 500 mg/L are considered to be treated in different ways [1].

The recommendations of the upcoming WFD Guideline for Sediment and Biota Monitoring are presented and initial experiences made within the ESB are presented. Advantages, disadvantages and remarks are illustrated. No general recommendation is given as the decisions are to be made on site-specific knowledge provided within the River-Basin-Management Plans.

References: [1] AMPS (Expert Group on Analyse and Monitoring of Priority Substances) 2004: Draft final report on the Agenda Item 6: Analysis and Monitoring of Priority Substances; EAF (7), 06/01, 1-101.