

# Relevance of moving recent and historic upstream contaminants for Hamburgs dredging strategy and the North Sea

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## Introduction

Ever since the industrial age, the Elbe has a history of contaminant transport from various sources facing towards the North Sea. The closedown of whole industries in former Eastern Europe and the implementation of treatment plants resulted in a decreasing contamination of sediments in the 1990's which facilitated the relocation of dredged material for the Port of Hamburg. Today due to upstream secondary sources sediment contamination in the Elbe estuary still exceeds action levels of Germany's dredged material regulation, hence contamination remains a key issue. On top of this additional contamination can put the dredged material management at risk – especially the deposition at sea which follows a strict licensing procedure. A significant increase of contaminant concentration may jeopardize the safe disposal of dredged material at one of Europe's severely monitored disposal sites – Buoy E3.

## Recent and historic contamination

Although sediment contamination significantly decreased over the past 25 years the situation is still not satisfactory. Contamination sources are mainly located within or near the river Elbe or its tributaries. A total of 29 relevant contaminants has been identified with respect to management goals at the river scale. Especially river maintenance works for navigation and shipping constantly have to consider the sediment contamination and the potential effects coming along with it when the sediments are to be relocated within the river system.

Additional, irregular contaminations can cause severe challenges. In May 2015 historically high PCB concentrations (up to 6.000 µg/kg sum 6 PCB-congeners) have been detected in the upper Elbe. This very recent and entirely unpredictable additional contamination has consequences for all downstream regions leading to environmental concerns within the river system and the North Sea.

## Influence of sediment quality for dredged material management

The quality of sediments to be dredged influences the potential disposal options. The dredged material management concept of the Port of Hamburg provides specific options for the sediments – most stringent is the deposition at Sea at which strict quality criteria have to be fulfilled. At the same time, this option has been identified as preferred option through a stakeholder process respecting the interests of about 40 different regional parties [1]. The licensing follows the assumption that the sediment quality does not deteriorate nowadays anymore. Ideally, the quality improves constantly or stays at the same level compared to recent years. Specifically irregular contaminations caused by an accident, or by negligent works at the riverside can disqualify the dredged material for North Sea deposition.

The potential management consequences are manifold. The presentation will outline the concerns of rising contaminant concentrations and the implications for the dredged material management for the Port of Hamburg. Examples will include the influence of natural conditions having an unpredictable influence on the sediment quality and also highlight the impact of the PCB incident in respect to sediment management. The recently gathered experiences indicate the need for flexibility as part of a sediment management concept. Further the examples will illustrate the importance of a system understanding at catchment scale for a successful management.

## References:

[1] Forum Strombau und Sedimentmanagement Tideelbe / IFOK (2015): *Dialog Strombau- und Sedimentmanagement Tideelbe*. Download: [http://www.dialogforum-tideelbe.de/wp-content/uploads/2015/11/bericht\\_web.jpg](http://www.dialogforum-tideelbe.de/wp-content/uploads/2015/11/bericht_web.jpg)