Reuse of sediment Policy framework

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Contents

Sullied Sediments

Sediment Assessment and Clean Up Pilots in Inland Waterways in the North Sea Region

Many of the inland waterways in Europe are under threat due to the introduction of Watch List chemicals that are not currently regulated under the European Water Framework Directive. These chemicals enter our waterways as a result of our day-to-day activities and through industry, and many have been shown to be harmful to wildlife and the wider aquatic environment. Regardless of their source, these pollutants accumulate in the sediments in our rivers and canals over time.

Water regulators and managing authorities do not always know the levels, locations or impacts of these pollutants. Nor do they have the tools to assess sediments confidently and make informed environmental management decisions. To address these issues, the Sullied Sediment project partnership of scientific experts, regulators and water managers is developing and testing new tools that will enable stakeholders to better assess, treat and prevent contamination from these chemicals. This work is being carried out at selected sites in the Elbe, Humber and Scheldt river catchments.

The intention of the Sullied Sediments project is therefore to help regulators and water managers make better decisions with regard to the management, removal and disposal of sediments, thereby reducing economic costs to private and public sector organisations, and the impact of these pollutants on the environment.

The partnership is also working to reduce the extent of chemicals entering the water system by raising awareness about what we, as consumers, are releasing into the environment through the use of common drugs and household products. This includes the involvement of volunteers in a sediment sampling initiative across the North Sea Region, which will inform and empower them as water champions in their local communities.

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Abstract

The Flemish Region has harmonised the legal framework with regard to the reuse of sediments by integrating the reuse of sediments into the existing legal framework for the reuse of excavated soil. The legal framework of the reuse of excavated soil in the soil legislation has been positive both on the practical side (harmonised and predictable framework for the sector) as on the environmental side (protection of the soil's functions for man and environment). These positive effects were the aim of the integration of the legal framework for the use of sediments in the soil legislation.

The decision on how and where to reuse sediment is based both on the chemical and physical (construction/technical) assessment. Additionally the Flemish legislation foresees an economical evaluation as well. The potential for valorisation is assessed on the basis of the theoretical, technical, economical and implementation potential. Subsequently, the cost of using this potential is compared with the cost of using other or primary materials.

History and Objectives

Since the 1st of June 2012 (implementation of the Waste Framework Directive 2008/98/EG), the reuse of sediments was subject to the end-of-waste criteria of the Waste Framework Directive. The way in which the Waste Framework Directive was implemented in the Flemish legislation, implied that the respect of the end-of-waste criteria needed to be confirmed by the waste administration on a case by case basis, as it was the case before the implementation of the Waste Framework Directive.

Until the 1st of April 2019, dredged sediment (contaminated or not) was considered to be waste and the reuse of sediments (contaminated or not) was only possible within the framework of the waste legislation. The case by case approach of the waste legislation was often experienced as problematic by the sector. Factors such as time-to-decision, contamination thresholds and uncertainty of the outcome of the procedure in general were perceived as affecting legal security.

The reuse of excavated soil has been integrated in the soil legislation since 1998 (integration in the former Soil Remediation decree in 1998 and integrated in the implementing act in 2001). The reuse of the excavated soil depends on the degree of contamination of the soil. Pollutants and their threshold levels will determine the possible use. Non-polluted soil can be used freely, without any restrictions. Soils with higher contents of pollutants can either be reused as "building material" in constructions or as soil. The latter is only possible if concentrations of contaminants in the excavated soil are not too high and if the receiving soil is already more polluted. Of course, if the pollution surpasses certain levels, the soils cannot be used and must be treated in a soils remediation centre.

The protection of the environment and the juridical protection of different actors (liability) involved in the use of the excavated soil is ensured by the traceability procedure. This procedure designates responsibilities to the different parties involved and ensures the use of the right soil on the right destination. The traceability procedure prescribes rules for excavation, transport, pre-treatment and the final use on destination. This procedure is supervised by a soil management organization that will attest the traceability and the correct use of the soil by a soil management report. The soil management organization is recognized by the OVAM. OVAM represents the Flemish government and has the authority to check every part of the chain, and if necessary take corrective measures.

The integration of the reuse of excavated soil in the soil legislation is considered positive both on the practical side (harmonised and predictable framework for the sector) as on the environmental side (protection of the soil's functions for man and environment). Because of these positive effects, a further harmonization of the legislation resulted in the integration of the legislation on the reuse of sediments in the framework of reuse of soil materials in the soil legislation[1]. From the 1st of April 2019, the reuse of dredged sediments (contaminated or not) is fully governed by the executive order of the Flemish Decree of 27th of October 2006 on Soil Remediation and Soil Protection and its executory order VLAREBO.

[1] Other materials were integrated as well but fall outside of the scope of this report.

Key elements

Analysis and assessment

The evaluation of an intended reuse of sediment requires an assessment of its chemical and physical qualities.

The **chemical assessment** needs to be based on representative sampling and analysis results. Key to a representative analysis result is the determination of a sampling and analysis strategy. Both sample locations and the substances that need to be analysed can be determined on a statistical basis and/or can be based on historical research. The determination of the substances that need to be analysed needs to focus on both 'traditional' substances as on emerging contaminants. With regard to mineral oil as one of the 'traditional' substances, a strategy for differentiating between biogenic and petrogenic mineral oil needs further implementation[2].

Both identifying potential (historical) sources of sediment pollution and determining their potential contamination profile is a complex process. Problematic factors can be the availability of data with regard to potential sources (permits, aerial photography, environmental reporting, …), the (often poorly documented) knowledge with regard to historical production processes, the unpredictable behaviour of contaminants in the historical (potentially modified) flow and course of the waterway and external factors such as flooding, historical dredging, covering of (parts of) waterways and other physical interventions in waterways. The bulk of this data will be available with, and will need to be disclosed by public authorities. This disclosure can take the form of an inquiry or can be part of a knowledge supporting system (public database).

Whatever the determining factor of the sampling and analysis strategy, there is a consensus that historical research needs to be or can be rewarded by imposing less samples than in a strategy that is strictly based on statistical parameters.

There's also consensus about the need that either legislation or codes of good practices based on the legal framework harmonise the sampling and sample preparation, the analysis methods and the threshold values. The Flemish threshold values have been set by the implementing act of the Soil Decree and are the same for both reuse of soil and reuse of sediments.

Physical assessment leaves less margin for harmonisation as it will need to be based on the intended use of the sediment. The need for physical treatment (dewatering, stabilisation, …) will therefore still be determined on a case by case basis. Since this assessment is a pure engineering matter, this should not have an impact on the legal security of the approach or the policy framework.

Criteria and preconditions for reuse

The decision on how and where to reuse sediment is based both on the chemical and physical (construction/technical) assessment. Additionally the Flemish legislation foresees an economical evaluation as well.

The treatment and the valorization aspects are evaluated in accordance with a code of good practice[3].

The potential for valorization is assessed on the basis of the successive aspects as given below. Subsequently, the cost of using this potential is compared with the cost of using other materials as a basis.

- Theoretical potential: maximum amount of sediment that can be reused based on chemical quality (can be expressed as % relative to the total volume dredged)
- Technical potential: part of the theoretical potential that can be reused within technical and chemical criteria (e.g. max. % organic matter, impact leaching on pH, …)

[2] See Sullied Sediments report 'Onderzoek analysetechniek minerale olie in sediment, verwijdering biogene interferenten', 23/2/2020.
[3] See Code of Good Practice 'Valorisatie bagger- en ruimingsspecie' OVAM, 20/12/2018.

- Economical potential: part of the technical potential that can be reused in an economical viable way (related to min. % dry matter after dewatering, minimal fraction 63 µm-2 mm, …)
- Implementation potential: part of the economical potential that can be reused under specific social and political conditions (taking into account policy instruments in force or coming into force) (e.g. minimal imposed % for (re)use of sediment, temporary storage in relation to opportunities for reuse within a timeframe of 3-5 years)
- Sustainable implementation potential: part of the implementation potential that can be developed within the preconditions of sustainable development (without causing environmental harm or social injustice) (e.g. switch away of use of primary raw materials (in road constructions or concrete), treatment of sediment in-situ/on-site, maximal reduction of fraction to be dumped in landfills, …)

Decision

The decision based on the assessment is simple and predictable: sediment can either be reused or will need to be treated. If reuse (with or without treatment) is impossible, the sediment will need to be disposed as waste.

The type of reuse (soil or building material) and the destination of reuse of the sediment reused will depend on the degree of contamination. Any reuse will be traced from origin (source location) to final destination by an independent body or institute ('certified soil management organisation').

Sediment that does not meet contamination thresholds that allow reuse, will require treatment unless this treatment is technically and/or chemically not feasible. The BATNEEC-principle is a factor in this feasibility assessment.

If treatment is feasible which results in a sediment that meets the thresholds for reuse as building material or soil, the actual reuse will again be traced.

If treatment is not feasible or does not reach reuse thresholds, the sediment will need to be disposed. Tracing will then take place within the waste legislation framework.

Results

The integration of sediment reuse in the soil legislation framework resulted in a harmonisation of the evaluation of the intended reuse of sediment. Instead of the former case by case approach, this led to a predictable framework for the sector and an increased legal certainty.

By abandoning the framework of the waste legislation, reuse has also been simplified from an administrative point of view. Furthermore, the destination site is no longer stigmatised because the reused sediment has lost any connotation with waste. By applying the traceability framework for the reuse of sediment, the reuse of the sediment does not mortgage the future of the destination site.

As a whole, this approach did enlarge the potential market for sediments (although the competition with primary materials remains strong) and should lead to an increased volume of reused sediment at a lower cost.

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Partners

The Sullied Sediments project partnership comprises 13 project beneficiaries:

Canal and River Trust (UK)

East Riding of Yorkshire Council (UK)

Ecossa (Germany)

Hamburg Port Authority (Germany)

Hamburg University of Applied Sciences (Germany)

Institut Dr Nowak (Germany)

Openbare Vlaamse Afvalstoffenmaatschappij (Belgium)

Radboud University (The Netherlands)

Socotec UK Ltd (UK)

University of Antwerp (Belgium)

University of Hull (UK)

University of Leeds (UK)

Vlaamse Milieumaatschappij (Belgium)

The partnership also receives expert advice from 12 strategic partners who form our Advisory Group:

East and North Yorkshire Waterways Partnership (UK)

Elbe Habitat Foundation (Germany)

Environment Agency (UK)

Federal Institute of Hydrology (Germany)

Foundation for Applied Water Research (Europe)

Hamburg Ministry of the Environment and Energy (Germany)

Northumbrian Water (UK)

River Hull Board (UK)

Sediment European Network Steering Group (European)

Thames Water (UK)

Vlakwa (water research consultancy) (Belgium)

Yorkshire Water (UK)

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Appendix

Table 1. Flowchart : Use of sediments

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