Work package 4 Sustainable assessment of measures and treatment systems for road runoffs

Objective

Stormwater runoff and drainage from construction sites may cause a number of problems for the environment. In many cases these flows hence have to be treated before discharge to the environment. The characteristics of pollutants that are important at a given site will vary depending on the geology, construction methods, and the sensitivity of the receiving waters. For each specific case, it is important to know what pollutants are the most important to treat. Pollutants that originate from construction sites in relatively large quantities and that also result in adverse effects onto the environment are found among organic and inorganic sediments, nutrients, heavy metals, oil and chemicals used for construction, and organic micropollutants. However, for some construction sites, such as tunnels, also parameters like pH and in extreme cases radioactivity can be of importance.

Runoff from construction sites is of temporary nature and mitigation of acute effects is often the main target, while accumulative effects are of less importance due to the short timescale. The pollutants to be addressed in combination with the sensitivity of the receiving waters govern what solution will best observe a given requirement for treatment. While methods to treat runoff from established roads are rather well-studied and documented, there is rather little documentation on the performance of temporary treatment units for managing runoff and drainage water during construction. Nevertheless, the technologies that are relevant have been studied in quite some detail, and it is hence possible to do a general assessment here of and evaluate how they can be brought into play for treatment of runoff and drainage water from construction sites.

The objective of this work package is to identify the pollutants relevant for construction sites and present and assess possible treatment unit operations. Guidelines are developed that suggest treatment systems for various types of construction work and conditions.

Description of work

The first task is a literature review addressing treatment of runoff and drainage water during construction work. It will investigate what hazards are relevant under road construction and which measures have been applied for runoff treatment under various conditions. As there is rather little scientific literature on such systems and their performance, this study will not be limited to the scientific literature, but also comprise gray literature to the extent that its sources can be validated. It will then address which physical, chemical, or biological unit operations can be brought into play to manage the various pollutants and issues, and estimate the unit costs of constructing and operating such facilities.

The second task builds on the knowledge gained in task 1, and establishes guidelines on how to construct treatment systems under specific conditions. It will address not only the more common construction conditions but also special conditions like tunnel boring or construction of roads through rock and soils rich on problematic minerals.

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