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Biogeochemistry as a tool for mine water treatment

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Raising public awareness of water treatment processes is one of the challenges facing our society as part of the prevention and protection of environmental health [1]. Indeed, because of the potential risk of water shortages caused by the effects of climate change and the use of water in many sectors of activity, it is interesting to understand that many difficulties can be encountered when treating contaminated water. In France, many wastewater treatment plants are visible from the roadside, proudly displaying wetlands filled with reeds, but who knows what is treated and how? These wetland treatment plants can be designed to remove various contaminants from water, such as organic or inorganic pollutants. Among them, passive mine water treatment plants have been designed to remove metal contamination using natural methods, including biological and geochemical processes. The discharge limits set for these treatment plants can sometimes challenge these natural processes that are generally dependent on numerous environmental factors. However, the factors controlling the removal efficiency have yet to be identified [2]. In this context, a project in progress aims to monitor a passive mine water treatment plant for one year in order to highlight the parameters needed to understand and improve treatment processes. It aims to understand how micro-organisms and geochemical processes can be involved in remediation strategies.

[1] WHO, Guidelines for drinking-water quality, 2022, 4th ed., Chapter 12, p. 329-490.

[2] Neculita et al., Chemosphere, 2019, vol. 214, p. 491-510.

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