# DIGEST

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# Revolutionizing Urban Water Treatment: GaBiF with ArtiRock for Sustainable Solutions

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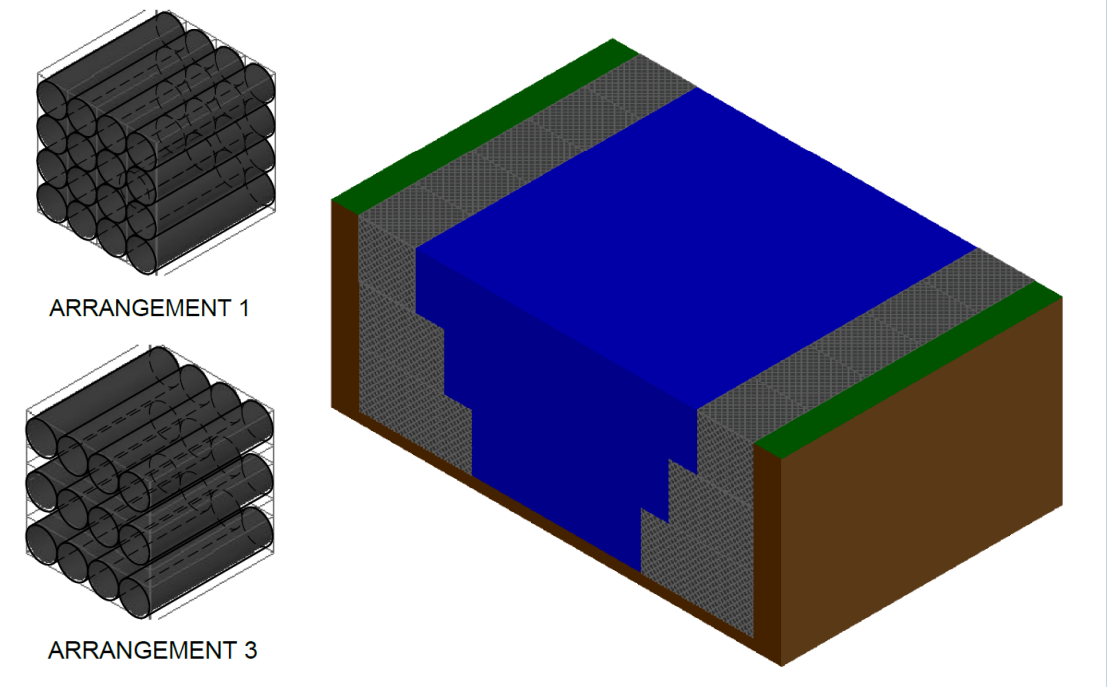


As urbanization and industrial activities continue to expand, water pollution in urban areas poses an increasing threat to environmental and human health, particularly in developing countries. Current water treatment methods often need more sustainability and are too costly for widespread implementation. Inspired by the urgent need for an accessible solution, our research focuses on developing ArtiRock, an artificial rock filter media, as part of the Gabion Filter (GaBiF) system. The innovation lies in repurposing industrial waste—specifically coal ash from Kapar Energy Ventures—as a primary component of ArtiRock. This approach not only provides an efficient filtration system but also reduces coal ash waste, contributing to circular economy goals. In our study, ArtiRock showed promising results in laboratory trials, effectively removing contaminants from open water sources such as lakes and rivers. Our tests demonstrated ArtiRock's ability to meet Malaysia's Water Quality Index (WQI) standards, with high contaminant removal rates under various environmental conditions. These findings contribute to environmental engineering by introducing a low-cost, sustainable filter media that addresses water treatment and waste management.

The significance of our research lies in its potential to make sustainable water treatment solutions accessible for urban communities, reducing reliance on expensive water treatment infrastructure. By enhancing the quality of urban waterways, this innovation can contribute to healthier ecosystems and communities, supporting broader goals in public health and environmental protection. The GaBiF system with ArtiRock has broader implications for addressing global water challenges, offering a scalable model for communities facing similar issues worldwide. As urban areas continue to grow, this project underscores the importance of sustainable, community-driven solutions to meet pressing environmental needs.

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