

Abstract to Nicole Fall Workshop

Revitalization of a Former Industrial Brownfield: Kalina Pond Rehabilitation Project

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The remediation and transformation of contaminated industrial sites into thriving recreational areas pose complex challenges that demand innovative solutions. This abstract provides a comprehensive overview of a successful rehabilitation project conducted at Kalina Pond, a historical site marred by industrial waste contamination in Świętochłowice, Poland.

The Kalina Pond, originally established as a fishing and leisure area in the early 20th century, fell victim to pollution due to nearby waste heaps from the "Hajduki" chemical plant. Paint and varnish production waste led to severe contamination, causing odorous emissions and polluted water, raising substantial environmental and health concerns within the community.

In response REMEA Poland (Group Menard) was charged to remediate the site and repurpose it into a vibrant recreational space. The project, spanning 43 months, encompassed two primary phases: design and execution.

The design phase, spanning 18 months, involved comprehensive planning, validation from regulatory bodies, equipment procurement, and a detailed remediation strategy based on lab and pilot tests. Rigorous safety protocols ensured worker and neighborhood safety, with airtight tents used for activities generating hazardous emissions.

The 24-month execution phase focused on implementing the devised strategy. The approach comprised two crucial elements: containing the pollution source (the waste mound) and addressing secondary contaminants (sludge particles dredged from the pond). Runoff from the waste heap was redirected to a treatment plant, while a specialized biological bed and a diffuser-based aeration system were introduced for enhanced purification. On Site Thermal Desorption techniques were employed to extract and neutralize dredged contaminated sediments after a soil washing pre-treatment, avoiding off-site disposal.

Through innovative solutions, residents are now relieved from persistent odors and extensive water pollution, previously pervasive in their lives. This success can be attributed to the implementation of various techniques:

- Creation of an anti-filtration barrier to halt contamination pathways
- Utilization of thermal desorption processes to destroy pollutants
- Reconstruction of sewerage infrastructure to prevent further contamination
- Assembly of mixing chambers for efficient effluent collection
- Implementation of bioremediation to restore pond water purity
- Identification of flukes as the biological contamination source
- Installation of an advanced aeration system to enhance water quality

The revitalization of Kalina Pond transcends mere pollution mitigation, illustrating the potential of collaboration, innovation, and sustainable development. The project's transformation of an industrial wasteland into a vibrant recreational area underscores its broader implications for community well-being and environmental sustainability.

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