On Site thermal treatment of mercury and pesticide impacted soils from former chlor-alkali plant

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Background and Objectives

The redevelopment of former industrial sites is a growing necessity as urban spaces are reclaimed for safer and sustainable use. The former chlor-alkali plant in Acre Bay, Israel—a 40ha site operational between 1956 and 2003—presents a unique challenge. The site is heavily contaminated with mercury from historical production processes and pesticides used during its operational lifetime. These contaminants pose significant risks to human health, ecosystems, and the feasibility of future site use.

Traditional remediation methods, such as excavation and off-site disposal, are unsustainable due to their high costs, logistical complexities, and the long-term risks associated with landfill storage. Instead, Haemers Technologies, in collaboration with LDD Advanced Technologies and Tidhar, has implemented an on-site thermal treatment strategy to safely and efficiently remediate the contaminated soils. This approach focuses on mercury recovery and the simultaneous treatment of multiple contaminants, paving the way for the site's redevelopment while adhering to stringent environmental and sustainability standards.

Approach and Activities

Following a successful pilot phase in 2022, the project transitioned to full-scale treatment in late 2023. The thermopiles, containing 4000 tons of contaminated soil, are undergoing Ex Situ Thermal Desorption (ESTD) at a target average temperature of 350°C. The process is designed not only to achieve regulatory compliance for contaminant levels but also to actively recover mercury, preventing its release into the environment.

Results and Lessons Learned

The full-scale thermal remediation process highlights several achievements:

- **Mercury Recovery**: Captured mercury vapors are condensed and treated, preventing environmental release.
- **Sustainability**: On-site remediation minimizes transport emissions and the reliance on landfilling.
- **Efficiency and Versatility**: The method successfully remediates soils with diverse contaminants while ensuring compliance with air emission standards.

Conclusion

This project represents a milestone in sustainable remediation, showcasing the technical and environmental benefits of on-site thermal treatment for soils with complex contamination profiles. It serves as a blueprint for similar projects globally, where sustainability, contaminant recovery, and multi-contaminant treatment are critical priorities.