

Developing Singapore's Environmental Guideline for the Utilization of Municipal Solid Waste Incineration Bottom Ash in Land Reclamation

Overview

In Singapore, municipal solid waste incineration bottom ash (MSW IBA) is currently disposed of by landfilling. In land-scarce Singapore, managing costs and space constraint associated with landfilling pose a sustainability concern, which has led to tightening legislation and increasing disposal levy. This has provided a motivation for the development of environmentally sound and economically viable utilization for IBA management. More importantly, a guideline including trace element leaching criteria needs to be established first to regulate ash utilization activities.

Description

- Compile and evaluate the worldwide data on IBA utilization and build a state-of-the-art bibliographic database.
- Establish uniform protocols for Singapore IBA sampling and full characterization, including physical, chemical and leaching property tests.
- Study IA leaching behavior and its influencing factors; devise and conduct leaching tests to assess the environmental impacts of different utilization scenarios.
- Conduct ecotoxicological study and human health risk assessment based on the potential risks from trace element leaching.
- Establish Singapore leaching standard for IBA utilization.

The project constitutes a sustainable waste management model in the following ways:

- Significantly alleviate economic burdens and environmental risks associated with IA landfilling.
- Promote overall waste recycling rate and professionalize the local waste management industry.
- Reduce reliance on aggregate import and save tremendous cost for construction industry. a big step forward achieving "zero landfill" and a truly environmental hub.

Objective

The objective of this project is to establish the first IBA utilization guideline in Singapore, so as to regulate the IBA utilization practices.

