

Soil, Sediment, Bedrock and Sludge

Landfill Cap Enhancements

Introduction:

The principle of landfill cover is to prevent the migration of contaminants (e.g. percolation). Water harvesting and vegetative cover are two methods that can be employed to enhance landfill cover. Water harvesting utilises runoff to manage the water balance of a landfill site. Vegetative cover reduces soil moisture through plant uptake and the process of evapotranspiration.

Description:

Precipitation to landfill cover is balanced by combining the effects of soil run-off, evapotranspiration, and percolation. For a certain amount of precipitation and to reduce percolation, the effects of run-off and evapotranspiration should be enhanced.

Water Harvesting:

Water harvesting involves runoff enhancement through landfill site water balance. This can be accomplished by covering the landfill surface with metal rain gutter situated parallel to the slope. The percentage of runoff increases with an increase in gutter coverage.

Vegetative Cover:

Vegetative cover reduces soil moisture via plant uptake and the process of evapotranspiration. Plant cover can also help prevent soil erosion and is more stable as it emphasises the use of natural materials and configurations, which implies durability.

Applicability:

Landfill cover enhancement is suitable for landfills, waste piles and some mine tailings. It could prove less costly than using a conventional barrier due to the fact it typically uses local resources. Its design is simple, easy to install over an existing landfill cover, and easy to remove if other uses for the land transpire in the future.

Limitations:

- Site evaluation is required.
- Plant coverage is seasonal.
- Too much gutter coverage (> 40%) will have little effect on runoff enhancement.

Cost:

Ensuring the correct configuration of landfill cover from the start should result in better containment treatment, which in turn helps keep costs down. Costs are determined on a case-by-case basis due to availability of construction material and design requirements at different sites.