

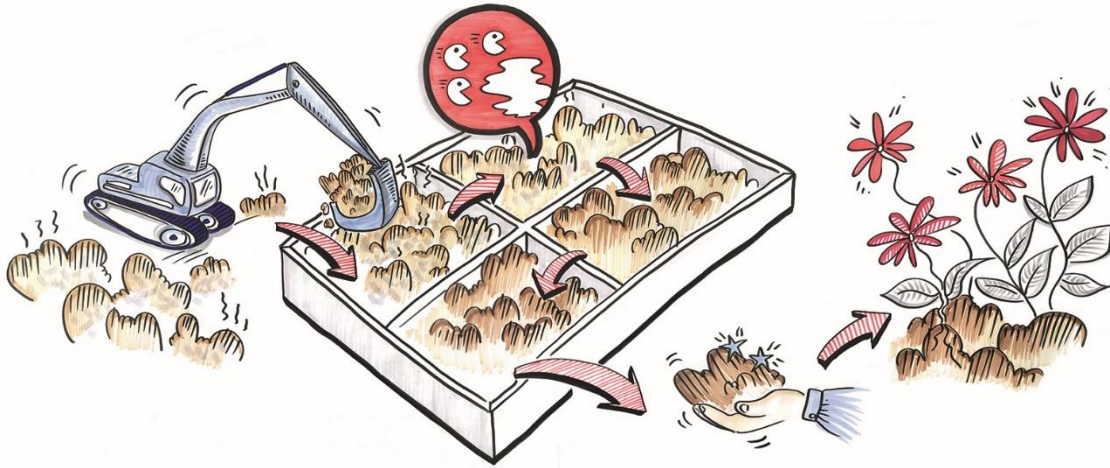
1) Environmental Award – Bioremediation Bay

“Tharisa Minerals - Enabling nature to detoxify and rehabilitate hydrocarbon polluted soil in order to minimize our ecological and environmental footprint.”

BIOREMEDIATION

Tharisa Minerals: Enabling nature to detoxify and rehabilitate hydrocarbon polluted soil in order minimize our ecological and environmental footprint.

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In November 2017, Tharisa launched the Hydrocarbon Clean-up Campaign. The campaign was to be carried out in 2 phases.

Phase 1 focused on the cleaning and correct disposal of hydrocarbon contaminated waste including soil.

Phase 2 of the campaign is the introduction of an In-house Soil Bioremediation Bay informally known as a Soil Farm. Construction of the Bioremediation Bay has been completed and we aim to bring into effect progressive rehabilitation measures launching in July 2019. This will be the perfect tool to allow nature the platform to replenish itself.

Bioremediation is a process that involves removal of the pollutant in the soil through bio-stimulation. Contaminated soil will be collected and contained within individual banded area. The correct concentration of 88 Hydrocarbon Oxidizer will be added to the soil that will react with the hydrocarbon, in a manner which will add oxygen to the soil. The oxidizer will metabolize the complex hydrocarbon chain, breaking it down into much simpler, smaller chains.

Bio-stimulation which refers to the introduction of organic matter will be initiated by the addition of a microbial blend. This will result in the bacteria consuming and metabolizing those smaller chains thus directly degrading the contaminant. The last stage is to ensure that the soil receives the correct nutrient blend in order to optimize hydrocarbon metabolism.

The by-products of the whole process, leaves the soil free of harmful hydrocarbons, and enriched with oxygen, nutrients and healthy microbes. This, in turn, means that we've taken a barren piece of soil, damaged by hydrocarbon contamination as a result of mining, and we have converted it into a body of soil where we can promote plant growth again, effectively turning death, into something livable again.

The treated soil will be re-used eliminating the disposal of immense masses of contaminated soil at the land-fills and an added bonus is that, it is a cost saving initiative, costs that can be redirected to other green initiatives. Furthermore doing in-situ remediation of hydrocarbons, we reduce the risk of secondary

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contamination by transporting hazardous waste, and we eliminate legal liability to the originator of the waste, in a cost effective, environmentally responsible manner, all while creating local jobs and supporting skills development to the local communities.