

Landfill Construction Applications



Pulp and paper clay residues (grey) being used to cap a landfill.

Introduction

Although significant strides have been made in the incorporation of IRC materials into infrastructure and other civil engineering applications, large volumes of materials still end up in landfills because landfilling is the cheapest, easiest handling alternative. Given the unique physical and chemical properties of IRC materials, disposal in a landfill is a waste of valuable resources, especially when viewed in life cycle analysis terms such as embodied energy and carbon sequestration. Even when no other alternative exists, using IRC materials to actually construct and maintain the landfill makes use of the intrinsic value of the materials and saves valuable landfill space.

IRC Materials in Landfill Construction

Most people think of alternate daily cover (ADC) when they think of using IRC materials in landfill applications. ADC is a layer of material used to cover the active landfill site at the end of the day to keep the waste in place and to prevent animals from feeding on the waste. Using IRC materials as ADC may sometimes be the only option, but in general this application does not take advantage of the unique properties of the IRC materials and is therefore a low value application. Consider that foundry sands can be used in liner construction as well as in the landfill cap. Blast furnace slag (BFS) can be used as aggregate in the drainage layers. BFS, foundry sands and crushed concrete can all be used as aggregate in constructing service roads.

Tire derived aggregate (TDA) has been used very successfully in a number of landfill applications. TDA has been used in the liner to prevent damage to the underlying geotextiles. Relatively thin layers of TDA provide the same penetration protection as a thick layer of sand, yet use less volume, increasing the working volume of the landfill. TDA also can be used as lightweight aggregate in the leachate collection and gas ventilation systems.

Benefits

Sending industrial materials to a landfill is sometimes the only appropriate and cost effective option, but that does not mean that the material is a waste and should actually go into the landfill. A number of IRC materials can be used in the construction and maintenance of landfills, which reduces the need for mining virgin aggregate and soil, and the associated use of water, fuel and reduces carbon dioxide emissions, while also saving valuable landfill space for true waste materials.