

Remediation of Hazardous Sludge by Soil Washing

Contamination

Thousands of Tonnes of mixed wet sludges are generated every year during the maintenance and cleaning of British roads and the drainage systems that service them. These mixed wastes are often classed as hazardous, being high in heavy metals, hydrocarbons and polyaromatic compounds. Solid contaminants, including plastic and metal fragments are ubiquitous. A former disposal route via agricultural soil amendment is no longer permissible due to the levels of contaminants present. The high content of naturally occurring organic material (NOM) also presents problems for waste disposal.

Challenges

Due to the mix of contaminants present (no single treatment method), high NOM (few landfill options), presence of plastic fragments (unsuitable as quality-marked compost or topsoil) and poor geotechnical characteristics (unsuitable as fill), finding suitable routes for treatment and disposal is challenging.

Generating reusable recycled products from this continuously generating and currently unsustainable waste stream has also proven extremely difficult.

Remediation Approach

Development of a bespoke soil washing treatment train to separate component fractions into largely recyclable materials, whilst concentrating hazardous contaminants into comparatively very small volumes with suitable properties for landfill acceptance.



UK Remediation soil washing train deployed at our facility near Exeter.

Once carefully designed, calibrated and balanced for the material to be treated, contamination can be concentrated into a small volume, with most other components made suitable for recovery and reuse. Recyclable aggregates (sand and gravel) are shown being extracted by the coarse washer (lower left). Light solid contaminants (plastic and wood) are removed by flotation and collected separately for disposal; fine fractions are washed and separated using a wet cyclone system (blue tanks, upper right). Highly organic material is separated for composting. Fine particulates are precipitated from solution and streamed for drying in the filter press (middle centre). On completion of processing, this material is suitable for production of quality-assured topsoil. Clean press water can be reused on the site. Remaining process water is further treated (tanks, far right) for discharge to mains sewer. The entire process is controlled by computer (blue cabin) to minimise process water use. Recovered aggregates can be further segregated using UK Remediation's three-way screener – visible in the upper left rear of shot.