

Landfill technology offers sustainable solutions

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Environment

Two SMEs from Poland and the UK have joined forces to develop an innovative and sustainable way to line landfill sites. Traditionally, landfills are lined with a mineral that has to be shipped from the United States. But Polish company PRGW has produced a system that uses locally sourced clay that can be modified to form a protective barrier between a landfill and the surrounding area. Northern Ireland-based Ecomesh produces vertical lining systems for landfills, and so a prospective partnership was in the offing when they heard about PRGW's technology.

Landfill sites must be lined properly to ensure that toxins do not leach into the surrounding area. Traditionally, engineers use a substance called Bentonite to form the required barrier, a mineral that can hold many times its own weight in water. It is an effective way of preventing leachates from migrating into neighbouring soil and watercourses. Unfortunately, such materials have to be shipped from other continents – an unsustainable and costly operation.

Now a viable European alternative to Bentonite has arrived on the market thanks to the work of Polish SME PRGW, which is based in Sosnowiec. The company has developed a way to modify clay so that it can be injected into the walls of a landfill site and form the necessary protective barrier.

Sustainable solution

"The clay will penetrate even the smallest of cracks – it can be distributed very precisely," explains Mateusz Kus from PRGW. "The clay is elastic and will not dry out and can withstand vibration."

Of course it is not a question of pumping in any type of clay – it must first be modified. Liquefied calcite, cement and other ingredients are added to the mixture.

The bonus of using this product is that the modification process is quite cheap – certainly more cost-effective than shipping Bentonite. It is also a sustainable solution because it utilises clay that is locally sourced – or uses clay that is deposited at the landfill itself. Essentially, this means reusing what would normally be regarded as a waste product.



A viable European alternative . . .

Product appeal

PRGW's technology looked extremely appealing to Ecomesh, a firm which manufactures its own patented vertical lining system for landfills.

"We were looking for ways of locally sourcing material that could be used as hydro-insulation barriers when our local IRC put us in contact with PRGW," explains Ivan Rowe, Ecomesh's managing director.

The two firms' work and expertise were a perfect fit, according to Rowe. "PRGW's modified clay-injection system works below ground level, whilst our barriers are mainly for above ground.

"Marrying the two systems together gave both of us a greater number of tools to offer clients for the remediation of their brownfield sites."

Kus agrees, noting that the two companies can now offer their clients a

complete solution that can protect the area surrounding a landfill from all kinds of pollution.

Meeting criteria

Using modified clay as a lining also sits well with the EU's 1997 Landfill Directive, which calls for sites to be run in a more sustainable fashion. Using clays from a local source is infinitely more sustainable than importing material from across the world. It is also possible to put waste clay through a treatment process and then recycle and use it for the lining system.

In addition, this reduces the need to ship hazardous waste for treatment – again a costly and environmentally unsustainable activity.

“The whole ethos of what we do is to treat waste locally,” says Rowe. “Most landfills receive large amounts of clay for disposal: what we say to our clients is don't tip it into a hole and bury it – put it to one side because we can use it to create the lining system for the landfill.

“We are taking what is effectively a waste product and utilising it in the landfill – that is an incredibly sustainable process.”

It is almost four years since Ecomesh first received information on PRGW's technology through the IRC network. IRC South Poland and IRC Northern Ireland helped the two companies make initial contact and arranged the first meeting, held in Krakow in June 2002.

“The IRC people were extremely helpful in the first stages – it would have been impossible to find each other without their assistance,” explains Kus.

Lasting relationship

The relationship continues to grow. The two firms are now jointly tendering for work in Poland, and once bureaucratic hurdles have been overcome, they will soon start work on their first site in Northern Ireland.

They are also taking part in the EU-backed NITRABAR project which is exploring ways to reduce nitrate contamination through the use of permeable reactive barriers. The three-year project is funded under the EU's LIFE-Environment Programme.

And the bonds between PRGW and Ecomesh look set to be strengthened further. The companies are now in the process of creating a European Economic Interest Group (EEIG), along with two other European partners.

According to Rowe, the move should produce effective solutions for their clients. “We are small to medium-sized companies, but we all bring something to the table in terms of brownfield remediation. Together as a group we feel we have the most cost-effective solutions for whatever environmental problems we may encounter.”

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