

Waste to Contain Waste Containment Systems for Pollution Prevention

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Waste materials have been used in concrete for many years, a typical example being fly ash from coal-fired power stations. The novel aspect of the concrete used in the work described in this presentation is that it is made entirely from industrial waste with no other materials except water. The resulting performance is not appropriate for use in typical structural applications but is well suited to waste containment.

Research in the nuclear industry has shown that cementitious materials offer many benefits for waste containment. Concrete has, however, not previously gained acceptance as a material for the construction of mineral liners for domestic waste containment because of concerns over high cost. This project exploits recent changes in the regulatory and economic environment to overcome these concerns.

In this presentation a programme to develop concrete landfill barriers will be described and the elements of the safety case for them will be presented. The safety case is based on predicting the transport of harmful species through the barrier. A model has been developed for the transport processes and, using data from laboratory tests, it has been validated against observations from site trials that have been in progress for the last five years.

Each of the elements of the safety Case will be introduced:

- Laboratory tests for permeability, diffusion , adsorption and physical properties.
- Site trials
- The computer model and the validation of the model using the test cells and other codes.
- Leaching from the barrier.
- Long term chemical stability of the barrier itself.
- Cracked samples.
- Modelling transport in the new barrier and flow into the local environment.