"This approach can improve the hazard classification from the traditional 'worst-case' assessment to a more 'realistic case' assessment and, hence, better fit the needs of our client."

Waste Management Company

ECN was asked to bring in experience

in geochemical modelling

Our client, a large international waste management company in Europe, wanted to determine the full hazard classification of a residue stream from the waste-to-energy process.

The approach is relatively straightforward when the hazard properties (HPs) of known chemicals and mixtures need to be assessed. However, the assessment becomes very challenging when these HPs are to be assessed for heterogeneous waste materials. The main reason for this is that analyses of the total content only reveals information regarding the elemental composition and it is largely unknown in which chemical forms the substances are present in these materials. ECN was asked to bring in experience in hazard classification in combination with expertise in geochemical modelling to assist with the speciation of elements the waste material. We had previously worked together on classification projects with other clients.

A novel approach

It was important to make a proper choice for the handling, permits and the appropriate landfill category of the waste material (non-hazardous or hazardous). Therefore a novel tiered approach was used for the assessment and the final characterisation of a residue stream from a municipal solid waste incinerator. The novelty of this work lies in a combined use of characterisation leaching tests, geochemical modelling, mineralogical data and the total composition to perform mass balance calculations. It allows to estimate how much of each relevant element is potentially available in a hazardous chemical form. This approach can improve the hazard classification from the traditional "worst-case" assessment to a more "realistic case" assessment and, hence, better fit the needs of our client.

ECN

Saving time and money

ECN's understanding of and experience in the classification of heterogeneous waste materials was very helpful in this project. Speciation was achieved through a combination of geochemical modelling as well as other tests. The residue was classified and confirmed the current approach to residue management was correct. As an added benefit, the study informed the key aspects of classification for heterogeneous wastes. Our client now has more insight into the impact of regulations and discussions on classification of waste materials in the future. This insight potentially could save considerable time and money in future classification and handling of waste to energy residues.

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