

# Case study: Assessment of Persistent Organic Pollutants (POPs) in waste electrical and electronic equipment (WEEE)

## The Need

Brominated flame retardants are commonly used in plastic manufacturing to reduce product flammability. There are many types, but some are classified as 'POPs'. **Wastes containing POPs above a set threshold cannot be recycled and the POPs must be destroyed.**

If released into the environment, POPs do not break down for many years, bioaccumulate and are toxic to humans and wildlife.

The use of POPs listed flame retardants in new plastic products is banned. However, some WEEE recycled today was made when these compounds were justifiably in-use – many WEEE items are over 20 years old, like old CRT monitors!

**However, the extent of POPs contamination in WEEE plastic, and which WEEE categories were most likely to be affected, was unknown.**

## The Solution

Working with ICER, WRc conducted a WEEE sampling programme involving nine recycling facilities in England and Wales.

**Thousands of plastic components from different WEEE items were scanned using an X-ray fluorescence (XRF) analyser to determine their bromine concentration – a key indicator for the presence of brominated flame retardants.**

By doing this we were able to identify which WEEE categories and plastic components which were most likely to contain brominated flame retardants.

To support the XRF analysis, laboratory testing was used to identify the brominated compounds present and whether those compounds were POPs.

## The Outcome

**Several WEEE categories were shown to contain POPs and hazardous chemicals in their plastic.**

Based on this evidence, the Environment Agency updated their guidance to advise that those WEEE categories should be classified as a POPs and hazardous waste. **The guidance is available on gov.uk website.**

**The plastic from these wastes must undergo a suitable treatment process to ensure a compliant WEEE recycling industry in the UK.**



**WRc's waste doctors delivered an expert sampling and characterisation programme of a large and complex UK waste stream to support industry compliance.**



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