Persistent Organic Pollutants:

What are POPs?

Persistent Organic Pollutants (also known as POPs) are toxic chemicals that adversely affect both the environment, and human health. POPs are transported by both wind and water, and can break down slowly, leaking into the ground, and thus entering food chains.

What are POPs found in?

The manufacture, sale, and use of products containing POPs is now banned. However, prior to this ban, POPs were used in various products, including household items. For example, POPs can be found in upholstered domestic seating. This includes: sofas, armchairs, upholstered dining chairs etc.. POPs are usually present in these soft furnishings as a result of a flame retardant chemical called Decabromodiphenyl Ether (decaBDE), which has been banned since 2019.

POPs are also found in some waste electrical and electronic equipment (WEEE). The POPs are in the plastics found in liquid crystal displays (LCDs) and cathode ray tubes (CRTs). As a result, The Environment Agency's Guide for Waste Classification (WM4) has reclassified many non-hazardous WEEE items as hazardous. Therefore, items now reclassified as hazardous must be subject to the Hazardous Waste Regulations 2005 and need special handling, storage, and disposal treatments.

How are POPs disposed of?

As of 1 January 2023, new compliance procedures came into effect which changed the way in which waste including POPs are managed. POPs must now be stored in a way that prevents: damaging it; release of POPs; contamination of other waste. Waste sites must keep POPs waste and Non-POPs waste separate. If non-POPs waste is contaminated with POPs waste, the whole load must be handled as POPs waste. In the past, POPs waste could be sent to landfill alongside other non-POPs waste, however, POPs waste must now be sent to a suitably authorised disposal or recovery site that can either completely destroy the POPs, or irreversibly transform the POPs (this is usually done via incineration).

Why do POPs concern me?

Some POPs that have been banned for decades (for example: mirex, dieldrin, hexachlorobenzene) are still detected at high levels in our environment due to these chemicals

being intentionally made to “last forever”. This is due to the chemicals being halogenated (there is a strong bond between carbon and chlorine/bromine/fluorine). Halogenated chemicals are resistant to environmental degradation including chemical, biological, and photolytic reactions. This concerns humans as we are exposed to POPs in a variety of ways. Mainly through the food we eat, and the air we breathe both indoors and outdoors.

POPs get into the food chain when they are disposed of incorrectly. When disposed of via landfill, the toxic chemicals enter the ground and find their way to water. When farm animals consume the contaminated land and water, the chemicals bioaccumulate in the fatty tissue of the organisms, and therefore, become concentrated as they move through the food chain. If humans eat contaminated animal/animal products, the chemicals then also store in humans fatty tissue. Fishes are among the major sources of exposure to POPs due to chemical leakage into waterways.

POPs are often present in food. However, due to regulatory limits, POPs present in food are usually at insignificant levels. Where there is a greater likelihood of contamination and a food sample has a test above the limit, regulatory limits make it simple for the enforcement authorities to have the contaminated food removed from the market.

Bioaccumulation of POPs in human fatty tissue is a major threat to human health. Exposure to these pollutants is associated with various serious health problems including: cancer, cardiovascular disease, diabetes, and reproduction problems, and endocrine disruption. The endocrine system is responsible for regulating hormones that control many body functions. The disruption of this system has the potential to cause adverse effects on reproductive, neurological, and immune systems. This can increase the growth of hormone-dependent cancers.

How are POPs being handled?

Many countries have now implemented the Stockholm Convention on POPs (2001). The manufacture, production and sale of items containing POPs is now banned. Furthermore, all waste sites have a responsibility to ensure the correct handling, management and disposal of waste containing POPs. Relevant regulating bodies such as the Environment Agency ensure that all sites are managing these items correctly, and enforce consequences to sites that are not following procedure.

Furthermore, WHO and UNEP are running a monitoring program for POPs in breastmilk to monitor reduction in human exposure. A steady decline in levels has been observed since 1980 for most countries.