Stockholm Convention Workshop on liability and redress concerning the use and intentional introduction of persistent organic pollutants into the environment

Identification of (additional) POPs

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1. Introduction

The criteria and the process to add additional POPs to the Stockholm Convention were developed at two meeting of the Criteria Expert Group (CEG) in 1998 and 1999. The process should incorporate criteria pertaining to persistence, bio-accumulation, toxicity and exposure in different regions and should take into account the potential for regional and global transport including dispersion mechanisms for the atmosphere and the hydrosphere, migratory species and the need to reflect possible influences of marine transport and tropical climates.
The result of the work of the CEG was after some modifications incorporated in article 8 and Annexes D, E and F of the Stockholm Convention.

2. Properties of POPs[1]

Most POPs may persist in the environment for periods of several years and may bioconcentrate up to ten thousands fold. These properties of unusual high persistence and semi-volatility, coupled with other characteristics, have resulted in the presence of POPs all over the world, even in regions where they have never been used. POPs are ubiquitous. They have been measured on every continent, at sites representing every major climatic zone and geographic region throughout the world. These include remote regions, where no significant local sources exist and the only reasonable explanation for their presence is long-range transport from other parts of the globe. POPs have been found, on a global scale, in soils, sediments, in the fat of fish and terrestrial animals, as well as in human breast milk. Some of the highest levels have been recorded in the polar areas of both the hemispheres.
Humans are generally exposed to POPs through the ingestion of food. A growing body of scientific evidence associates human exposure to individual POPs with cancer, neurotoxic, behavioural, reproductive effects, immutoxicity and other effects. The mechanism for many of these effects appears to be through disruption of the human endocrine system. Humans appear to be extraordinary sensitive to these chemicals during fetal development.
POPs are linked by a growing body of evidence to reproductive failure, deformities, malfunctions in fish and wild life. Studies from the Great Lakes environment revealed that a dozen of Great Lakes predators as eagles, cormorants, trouts, minks, turtles and others, suffered significant health impacts including population decline and reproductive dysfunction, eggshell thinning, metabolic changes,

[1] Global Programme of Action for the protection of the marine environment from land based activities, http://www.gpa.unep.org/pollute/organic.htm

deformities and birth defects, cancers, behavioural changes, abnormally functioning thyroids and other hormone system dysfunction, immune suppression, feminisation of males and masculinisation of females.

3. Present and additional POPs

At present the following chlorinated organic chemicals are POPs according to the annexes A, B and C of the Stockholm Convention.
Pesticides: Aldrin, Dieldrin, Endrin, Chlordane, DDT, Heptachlor, Mirex,Toxaphene, Hexachlorobenzene (HCB)
Industrial chemicals: Polichlorinated Biphenyls (PCBs), HCB (dual use)
Unintended produced POPs: Dioxins, Furans, HCB, PCBs

Taking into account the text of the Stockholm Convention and the report of CEG2 the following considerations should be followed when further POPs are proposed to be added to the Convention.
"Substance", in the context of Annex D, includes groups of related substances or classes of compounds. Organo-metallic chemicals are organic chemicals and therefore fall within the scope of the Convention.
The assessment process includes the consideration of transformation products of substances that possess POPs properties. Parties are able to nominate organic substances that were not in themselves POPs, but whose transformation products satisfy the criteria in Annex D.
This Annex contains information requirements and criteria for the proposal to list an additional persistent organic pollutant.
The criteria are:

- Persistence (water > 2 months, soil/sediment > 6 months or other evidence)
- Bio-accumulation (bio-concentration/-accumulation in fish > 5000 or log Kow >5 or other evidence or monitoring in biota)
- Potential long range environmental transport LRT (measured levels of concern, monitoring or model predictions indicating LRT)
- Adverse effects/toxicity or ecotoxicity data (where possible compared with detected or predicted levels of the chemical resulting or anticipated from its long range environmental transport)

Information is required on all criteria, even though there are no "ands" linking subparagraphs 1 (a), (b), (c), (d) and (e) of Annex D. The screening criteria should be applied in a flexible, transparent way taking all information into account in an integrative and balanced manner.

Annex E on information requirement for the risk profile asks inter alia for

- Sources (production, uses, releases)
- hazard assessment (interaction with other chemicals)
- environmental fate (bio-accumulation factor)
- monitoring data (Dieldrin > Endrin/less used)
- local exposure and LRT exposure (bioavailability)
- national/international hazard/risk information
- status under other Conventions

This information is reviewed to evaluate whether a chemical is likely, as a result of its long range transport, to lead to significant adverse human health and/or environmental effects, such that global action is warranted.

4. Analytical identification of POPs

For the question of responsibility for environmental pollution by POPs one needs to analyse past, present, future releases. The assessment of past releases raises the question when one became aware of the hazardous properties and the impact of POPs and what actions were taken. Not only the releases during production and use are part of the POPs problem but also their international trade and the transfer of production to other countries. Also donations of POPs by countries, IGO or NGO which may have led to stockpiles have to be considered. POPs are also released from wastes and contaminated sites.
The analytical identification of POPs in man (breast milk, fat) or the environment (water, soil, sediment, biota) requires due to the low concentrations that have to be detected sophisticated analytical expertise and equipment. To identify time trends and to compare results from different regions the compatibility of sampling, analysis and documentation has to be guaranteed.
If one wants to determine the source of a POP at the site of release, in products (PCB in transformers) or in stock piles one needs an analysis of the substance and its impurities. For POPs that consist of a mixture of isomers like PCB or toxaphene one can compare the distribution of isomers (product specific fingerprint, if available) and can get some indication about the production process and the producer.