MINAMATA COP 1:

BRIEF ON MERCURY WASTE

A key decision that will be discussed at Minamata COP 1 is the definition on thresholds for identification of mercury waste. This discussion is currently led by Japan, who has prepared a road map and a thought starter document for consideration by COP1. Article 11 of the Minamata Convention (MC) provides that the relevant definitions of the Basel Convention (BC) shall be applied or used as guidance to wastes covered under the MC.

DEFINING MERCURY WASTE

The BC defines wastes as "substances or objects which are disposed of or are intended to be disposed of or are required to be disposed of by the provisions of national law". Although mercury wastes are listed in the "categories of wastes to be controlled" as Y29 under the BC, the thresholds for their identification are not prescribed and thus, they are currently left to each country to decide.

Article 11 of the Mercury Treaty notes there are three categories of wastes requiring definition and these are substances or objects:

(a) Consisting of mercury or mercury compounds;

(b) Containing mercury or mercury compounds; or

(c) Contaminated with mercury or mercury compounds

Category (a) generally refers to elemental mercury or commercial mercury compounds that may be stored, stockpiled or are being 'retired' from the market due to import/export bans or other regulations that require that they be treated as waste.

There is some debate as to whether elemental mercury 'waste' should be defined on a 'purity' basis (e.g. a minimum purity of 95% or 99.999%) for this purpose. IPEN supports a threshold of 95% purity or above for elemental mercury (as traded mercury may not have >99.9% purity) as long as any mercury substance with <95% purity is categorised as a substance contaminated with mercury or mercury compounds and is treated as 'mercury waste'. In this way, there are no loopholes to allow mercury related substances to avoid classification as waste when they should be subject to the waste definitions. Elemental mercury of 95% or greater purity has laboratory reagent status according to the American Chemistry Society (ACS Reagent Chemicals, 10th Edition).

Figure 1. Examples of packages of elemental mercury which may be stored permanently as waste.
Source: US DoE (2009)

IPEN calls for mercury waste consisting of mercury or mercury compounds to be 'retired' from the mercury supply chain by transforming it via treatment techniques so that it can no longer be used as mercury. This can be achieved by commercial techniques to transform mercury into mercury sulphide or mercury sulphide polymers and sending it for permanent storage (see IPEN COP1 Brief on Contaminated Sites for more detail). In this way, the mercury can be prevented from entering legal or illegal supply chains which may lead to use in ASGM. This should include mercury that is recovered from oil and gas production as well as mercury recovered from spent catalysts in this and other industry sectors.

Category (b) largely refers to former products or objects containing mercury or mercury compounds

(e.g. e-waste, batteries, CFLs, thermometers etc.) and could be defined by either a minimum threshold (milligrams of Hg content) or simply the presence of any added mercury to the object. In the latter case, any information indicating the presence of mercury in the product should render it 'mercury waste'.

This definition is intended to capture products and other objects that have deliberately had mercury added to them as a part of their design such as the mercury oxide batteries or fluorescent lights depicted above. Both of these products can now be treated to recover the mercury content and recycle the non-hazardous components. Other products such as e-waste containing mercury can be treated to remove toxic metals in some circumstances.

Figure 2. Button cell batteries.
Source: Government of Canada

Figure 3. CFL lamps wastes.
Source: Ecowaste Coalition

IPEN supports the approach that any mercury content should render the discarded object as 'mercury waste' and the object should be subject to treatment to recover the mercury and decontaminate the object (this may permit recycling of the non-toxic components of the object if appropriate). Mercury recovered from discarded articles containing mercury should be identified and prevented from re-entering the global market for mercury to prevent further releases and emissions that may result from its future uses.

Category (c) comprises the largest share by volume of the waste categories, as it may include industrial wastes, contaminated soils, contaminated mixed wastes and so on. This category is best defined according to the mercury concentration present in the waste 'matrix' (i.e. soil, sludge, etc.).

IPEN supports a concentration threshold to define waste contaminated with mercury or mercury compounds of 1 ppm. Any waste containing mercury above this threshold should be subject to treatment to recover and extract the mercury.

Technology such as indirectly heated vacuum distillation units (Figure 4) can recover mercury from contaminated soils, sediments, sludges and other wastes, leaving the treated soils in a reusable state with levels of mercury at < 1 ppm. Mobile technologies using similar systems have been used in Australia, and more research and development in application of transportable technology should be implemented to assist with removal of mercury from contaminated materials such as soil, sludge and sediment in developing countries to avoid landfilling mercury waste.

IPEN does not support any form of leachability test to define waste contaminated with mercury or mercury compounds as this test assumes that the waste will be landfilled and this is not an environmentally sound method to manage mercury waste. Leaching tests are intended to simulate landfill conditions and involve subjecting a sample of waste to a procedure where water or weak acid is applied and the concentration of substances such as mercury that leach from the waste into the liquid are measured. Theoretically, the more toxic material that leaches from the waste the higher the level of landfill containment that is required (such as multi-lined landfilled cells).

IPEN does not support this approach as the definition presupposes the disposal method – which in this case is landfill. Leachate threshold definitions can be identified by the unit of measurement which is usually µg/litre or mg/litre. Solid and sludge waste mercury threshold concentrations should be measured in mg/kg or ppm which does not presuppose the final disposal or treatment arrangements. Experts also agree that incineration of mercury waste is not appropriate (Merly and Hube 2014) and therefore threshold concentrations should not be constructed to facilitate incineration of mercury wastes.

DEFINING MERCURY WASTE

There exists an important overlap between the definition of mercury wastes and the definition of sites contaminated with mercury. A key reason for IPEN supporting a 1 ppm Hg threshold to define mercury waste is to address mercury wastes excavated from contaminated sites. IPEN also supports a threshold to define a site contaminated with mercury as a site that has a soil concentration above 1 ppm mercury. The definition of waste contaminated with mercury or mercury compounds and sites contaminated with mercury or mercury compounds should be harmonised at 1 ppm to prevent 'leakage' from the waste management system.

To give a simplistic example, if the Mercury Treaty defines 'mercury waste' as waste contaminated with mercury or mercury compounds at 1ppm or above, but a national jurisdiction defines a mercury contaminated site as > 25 ppm mercury, then the soil on the site between 1-25 ppm mercury is 'mercury waste' under the Treaty definition but does not have to be remediated or cleaned up under national laws that only define the site as contaminated above 25 ppm. This creates an impasse where mercury waste may remain untreated and pose a threat to humans and the environment because the definitions are not harmonised at 1ppm. The UK has established a maximum threshold concentration of mercury for residential land at 1 ppm.

Figure 4. Indirectly heated vacuum distillation unit. *Source: econ industries GmbH cited in UNEP/ISWA 2015.*

Conversely, if a mercury waste threshold concentration is adopted that is higher than national thresholds for mercury contaminated sites, then contaminated soils excavated from such contaminated sites may not have the status of 'mercury waste' and may be dumped, exported or otherwise inappropriately managed.

IPEN SUPPORTS A CONCENTRATION THRESHOLD OF 1PPM TO DEFINE WASTE CONTAMINATED WITH MERCURY OR MERCURY COMPOUNDS.

REFERENCES

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