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## MEDITERRANEAN ACTION PLAN

Fifth Meeting of the Working Group  
for Scientific and Technical Co-operation  
for MED POL

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DRAFT DEFINITIONS AND LISTS OF SUBSTANCES FOR MERCURY AND MERCURY  
COMPOUNDS, CADMIUM AND CADMIUM COMPOUNDS, ORGANOHALOGEN COMPOUNDS  
AND USED LUBRICATING OILS

In collaboration with



FAO



WHO



UNIDO

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## 1. INTRODUCTION

Article 5 of the Protocol for the Protection of the Mediterranean Sea against pollution from Land-based Sources binds the Contracting Parties to eliminate pollution of the protocol area by substances listed in Annex I to the protocol and, to this end, to elaborate and implement, jointly or individually, as appropriate, the necessary programmes and measures, which shall include, in particular, common emission standards and standards of use.

Annex I to the Protocol contains, inter alia, the following substances, families and group of substances, selected mainly on the basis of their toxicity, persistence and bioaccumulation:

- Organohalogen compounds and substances which may form such compounds in the marine environment;
- Mercury and mercury compounds;
- Cadmium and cadmium compounds;
- Used lubricating oils.

In all cases, the Annex does not apply to discharges containing the substances listed above which are below the limits defined jointly by the Parties. In the case of Organohalogen compounds, those substances which are biologically harmless, or which are rapidly converted into biologically harmless substances, are excluded.

On the basis of assessments of the state of pollution of the Mediterranean Sea by (a) mercury and mercury compounds, (b) cadmium and cadmium compounds and, (c) used lubricating oils, appropriate measures have been proposed for consideration of the Working Group and eventual adoption by the Contracting Parties (documents UNEP/WG.160/8, UNEP/WG.160/9 and UNEP/WG.160/7 respectively). In all three cases, either because of the terms of the protocol itself, or for technical reasons, it is not necessary for the Contracting Parties to define specific substances within the groups. In the relevant part of this document, therefore, the normal definition of the term and/or the interpretation with respect of coverage has been prepared. Wherever appropriate, simply for information and guidance purposes, lists of particular substances within the groups which are or can be released into the marine environment, are provided. These do not necessarily represent the actual forms of the substances actually encountered in the marine environment, as many are subject to transformation therein.

Similar material is provided in the case of organohalogen compounds, for which the relative assessment document has still to be prepared, in order to solicit comments designed to facilitate the preparation of proposals in the eventual draft.

## 2. ORGANOHALOGEN COMPOUNDS

The accepted definition of the term "organohalogen compound" is "an organic chemical compound containing any of the chemical elements bromine, chlorine, fluorine or iodine in any form".

As the terms of the protocol exclude substances in this category which are biologically harmless or rapidly converted to such, from the terms of Article 5 and Annex I, a list of substances to be covered by such terms will have to be eventually adopted by the Contracting Parties.

The following substances are among those normally included in equivalent lists:

Industrial fluids: Polychlorinated biphenyls (PCBs).

Pesticides and their degradation products

- pp-DDT
- op-DDT
- pp-DDE
- pp-DDD
- chlordane
- aldrin
- dieldrin
- endrin
- endosulfan
- toxaphene
- heptachlor
- heptachlor oxide
- hexachloro cyclo hexane (HCH) (mixed isomers)
- gamma - HCH (lindane)

### 3. MERCURY AND MERCURY COMPOUNDS

The term "mercury and mercury compounds" as given in Annex I to the Protocol does not provide for the exclusion of any form of mercury.

The definition of the term "mercury" should be "the chemical element mercury" and the interpretation of the term "mercury compounds" in terms of coverage should include all chemical compounds containing mercury in any form or, alternatively, the mercury contained in any such compounds.

No lists of specific substances under this item of Annex I is therefore indicated.

For information and guidance, mercury releases into the marine environment in industrial wastes include the following forms:

**Metallic Mercury ( $Hg^0$ )**

- waste from the use of electrodes in alkali plants
- waste from the use of mercury in electrical contacts

**Mercuric Chloride ( $Hg Cl_2$ )**

**Mercuric Sulphate ( $Hg SO_4$ )**

- catalysts in the production of polyvinyl chloride (PVC)

**Methylmercury ( $(CH_3)Hg^+$ )**

- impurity occurring during PVC production

Mercury can also reach the marine environment in the following forms:

**Mercuric Chloride ( $Hg Cl_2$ )**

- as a contaminant in phosphate fertilizers

**Phenylmercury ( $(C_6H_5)Hg^+$ ) salts**

**Methylmercury ( $(CH_3)Hg^+$ ) salts**

**Ethylmercury ( $(C_2H_5)Hg^+$ ) salts**

**Ethylmercury ( $(C_2H_5)Hg^+$ ) organics**

- pesticides used in agriculture, mainly as fungicides and fungicidal seed-dressings

#### 4. CADMIUM AND CADMIUM COMPOUNDS

The term "cadmium and cadmium compounds" as given in Annex I to the Protocol does not provide for the exclusion of any form of cadmium.

The definition of the term "cadmium" should therefore be "the chemical element cadmium", and the interpretation of the term "cadmium compounds" in terms of coverage should include all chemical compounds containing cadmium in any form or, alternatively, the cadmium in any such compounds.

No list of specific substances under this item of Annex I is therefore indicated.

For information and guidance, cadmium releases into the marine environment in industrial wastes may include the following forms, as a result of their uses as detailed below:

**Cadmium sulphate ( $\text{CdSO}_4$ )**

- electrolyte in Weston cell
- antiseptics and astringents
- starting material in Cd production
- fungicide and bactericide
- lubricant

**Cadmium nitrate  $\text{Cd}(\text{NO}_3)_2$**

- coloring porcelain and glass
- photographic flash powder
- Cd-Ni batteries

**Cadmium chloride ( $\text{CdCl}_2$ )**

- photography
- dyeing and calico printing
- testing for pyridine bases
- pyrotechnics
- copying papers

**Cadmium bromide ( $\text{CdBr}_2$ )**

- photography
- process engraving
- lithography
- epoxy resin

**Cadmium iodide ( $\text{CdI}_2$ )**

- marme reagent
- photography
- lithography
- process engraving

**Cadmium oxide (CdO)**

- plating baths
- catalysts
- resistors in electrical furnace
- electrical contacts
- non-chalking pigments
- coating for luminescent colours
- lubricant
- acaricide

**Cadmium hydroxide (Cd(OH)<sub>2</sub>)**

- Cd-Ni storage batteries

**Cadmium sulphide (CdS)**

- extreme pressure lubricant
- radiation detection devices
- pigment manufacture (wide application)
- solar energy cells
- fireworks (to colour flame blue)
- infrared windows
- photosensitive elements

**Cadmium selenate (CdSe)**

- pigments (wide variety)
- phosphors and luminescent materials
- snooperscopes, sniperscopes and metasopes

**Cadmium tungstate (CdWO<sub>4</sub>)**

- luminous pigment

**Cd-arsenides, -antimonides and -telluride**

- alloys and semiconductors
- phosphors and luminescent materials

**Cd-salicylate**

- external antiseptic

**Cd-acetate**

- porcelains and pottery (to give iridescent effects)

**Cadmium carbonate (CdCO<sub>3</sub>)**

- catalyst

**Organocadmium compounds**

- catalysts
- fungicides and anthelmintics

## 5. USED LUBRICATING OILS

The term "used lubricating oils" as given in Annex I to the protocol does not provide for the exclusion of any particular type.

No specific list under this item of Annex I is therefore indicated, but a clear definition of the term "used lubricating oils" will have to be adopted.

On the basis of the relative assessment document (UNEP/WG.160/7), the following definition is proposed:

"Any semiliquid or liquid used product totally or partially consisting of mineral or synthetic oil, including the oily residues from tanks, oil-water mixtures and emulsions, but not including discharges of oil from oil production, refining and storage installations".