

**HELSINKI COMMISSION**  
**Baltic Marine Environment Protection Commission**



**THE PESTICIDES**  
**SELECTED FOR IMMEDIATE PRIORITY ACTION**

**A compilation and evaluation of the information given by the Contracting Parties with the focus on use and legislation.**

Submitted by the Co-ordinator of the Project Team on Hazardous Substances

Christine Füll

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HELSINKI COMMISSION  
Baltic Marine Environment Protection Commission  
Katajanokanlaituri 6 B  
FIN-00160 Helsinki  
Finland  
Tel. +358-9-6220 220  
Fax: +358-9-6220 2239  
E-mail: [helcom@helcom.fi](mailto:helcom@helcom.fi)

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## 0. EXECUTIVE SUMMARY

In 1998 the HELCOM Recommendation 19/5 on the HELCOM Objective with regard to hazardous substances was adopted. The objective is to prevent pollution of the Convention Area by continuously reducing discharges, emissions and losses of hazardous substances towards the target of their cessation by the year 2020, with the ultimate aim of achieving concentrations in the environment near background values for naturally occurring substances and close to zero for man-made synthetic substances. The corresponding substances selected for immediate priority action (Rec. 19/5, Attachment, Appendix 3) comprise 26 pesticides, which are dealt with in this report.

Pesticides are intentionally introduced into the environment to prevent, destroy, repel, or mitigate any pest. However, the pesticides selected for immediate priority action are persistent, toxic and bioaccumulate in the environment, intrinsic properties, which make them a serious and unacceptable threat to human and environmental health.

From the regulatory point of view the selected pesticides are all covered by various HELCOM Recommendations (applying for all Contracting Parties) and EC Directives (applying for EU Member States and Accession Countries), described in detail in tables I and II, respectively, in Annex II. Various national regulations and legal acts are listed in Annex I. Nine pesticides are covered by the Stockholm Convention on Persistent Organic Pollutants (2001). Table III in Annex II gives an overview on the legal situation concerning the selected substances used as pesticides in the Contracting Parties. The given information is only related to the potential use as a pesticide. Explanations concerning possible other uses, exceptions and detailed information can be found in chapter 2.

Although most of the selected pesticides are not used anymore in nearly all Contracting Parties, they are stored in some countries as obsolete pesticides. The problems and threats arising from these stockpiles as well as some ideas to combat the problem of obsolete pesticides are described in a subchapter of the introduction.

Chapter 2 is dealing in alphabetical order with all pesticides selected for immediate priority action. The main focus is on use and legislation/regulatory status. The details are mainly based on the information submitted by the Contracting Parties (Denmark, Estonia, European Community, Finland, Germany, Latvia, Lithuania, Poland, Russia and Sweden) via a questionnaire.

The data submitted by the Contracting Parties and information extracted from additional sources (see references) clarified the legal, market and use situation and it can be concluded that the selected pesticides for immediate priority action (HELCOM Recommendation 19/5, Attachment, Appendix 3) are no longer in use or have never been in use, are not registered for the use as a pesticide, or have been banned – either completely for all uses or at least for the use as a pesticide. This applies for all Contracting Parties. However, there might be a few uncertainties with regard to the Russian Federation. Thus, the working list of hazardous substances can be updated.

This report shows progress in the implementation of HELCOM Recommendation 19/5. Concerning the pesticides selected for immediate priority action of its Appendix 3 the cessation goal can be taken as largely reached. This conclusion is based on the assumption that further steps will be undertaken to combat the problem of obsolete pesticides.

## 1. INTRODUCTION

In 1998 the HELCOM Recommendation 19/5 on the HELCOM Objective with regard to hazardous substances was adopted. The objective is to prevent pollution of the Convention Area by continuously reducing discharges, emissions and losses of hazardous substances towards the target of their cessation by the year 2020, with the ultimate aim of achieving concentrations in the environment near background values for naturally occurring substances and close to zero for man-made synthetic substances. The corresponding substances selected for immediate priority action (Rec. 19/5, Attachment, Appendix 3) comprise 26 pesticides, which are dealt with in this report.

### What are pesticides?

Pesticides are substances or mixtures of substances intended for preventing, destroying, repelling, or mitigating any pest. Pests can be insects, mice and other animals, unwanted plants (weeds), fungi, bacteria and viruses. The term pesticide thus applies to insecticides, herbicides, fungicides, and various other substances used to control pests. An overview of types of pesticides and their functions is given in table V in Annex II. Pesticides are intentionally introduced into the environment, which might lead – besides intended effects – to unintended harmful effects and threats to the environment.

### Why have these pesticides been selected?

The pesticides, included in HELCOM Recommendation 19/5 and selected for immediate priority action are taken from Annex 1 of the 1992 Helsinki Convention, Part 2 and 3. They have been mainly selected because of their intrinsic properties, namely their:

- ❑ persistency
- ❑ toxicity or other noxious properties
- ❑ tendency to bio-accumulation

as well as on other characteristics liable to cause pollution, which are further specified in this Annex.

### Legislation, international conventions and recommendations

One of the main pieces of legislation concerning pesticides is the **Council Directive 91/414/EEC**, which provides the framework for the authorisation, the placing of plant protection products on the market and its use in the European Union. One of the principles of the Directive consists in the development of a community list of accepted active substances, which appears in Annex I of the Directive. This list contains active substances whose use in plant protection products is considered safe. This list is established following well-defined steps of evaluating submitted data and established decision procedures. A working programme for all existing active substances is set up by the Directive (Art. 8(2)). All active substances on the market in Member States on 25 July 1993 must undergo a full evaluation verifying whether they fulfil the obligations of Art. 5 and therefore can be listed in Annex I of the Directive. Lindane and Quintozene, being on the list of active substances to be assessed in the first stage have not been included in Annex I to Directive 91/414/EEC. Table II in Annex II provides an overview on some other directives having regard to pesticides.

The pesticides Aldrin, Chlordane, Dieldrin, DDT, Endrin, Heptachlor, Hexachlorobenzene, Mirex and Toxaphene are among the twelve persistent organic pollutants (POPs), which are chosen for international action to reduce/eliminate their releases on a global level and thus to protect human health and the environment under the **Stockholm Convention on Persistent Organic Pollutants (2001)**. Persistent organic pollutants (POPs) are mainly of anthropogenic origin and, to a varying

degree, resist photolytic, biological and chemical degradation. POPs are relatively toxic, i.e. resulting in adverse environmental and human health effects at locations near and far from their sources. They are characterised by low water solubility and high lipid solubility, leading to their bioaccumulation in fatty tissues. They are also semi-volatile, enabling them to move long distances in the atmosphere (long range transport) before deposition occurs (IPCS, 1996). The occurrence and ecological impact of POPs in aquatic ecosystems has been particularly evident in the Great Lakes, the Baltic Sea and in the Arctic (TemaNord, 2000). Table V in Annex II lists, in which other forums the selected pesticides are of concern.

Table I in Annex II gives an overview on **HELCOM Recommendations** with regard to pesticides. Further HELCOM Recommendations comprising broader issues also pertinent to pesticides (e.g. Recommendation 12/3 on Best Available Technology (BAT), Recommendation 13/6 on Best Environmental Practice (BEP) etc.) are not listed in detail but can be reviewed on <http://www.helcom.fi>.

The legal situation, as well as the market and use situation concerning the selected pesticides for immediate priority action has now been clarified and the working list of hazardous substances can be updated.

### **Obsolete Pesticides**

Obsolete pesticides are old, out-dated, pesticides, unused for various reasons and stockpiled as a kind of waste or waiting to be waste and include large quantities of banned organo-chlorine compounds that are highly persistent in the environment, such as Dieldrin, Endrin, HCH, DDT and others. Dealing with obsolete stocks is a global problem. The world total is estimated to be over 500000 tons. (Poznan, 2001). Approximately 20000 tons of these pesticides are located in Africa and the Middle East. While exact quantities are unknown, large stockpiles also exist in Central Eastern European Countries (CEEC) and the Newly Independent States (NIS).

The reasons for the accumulation of these pesticides are various and include the banning of pesticide products after import into the country, supply of banned products to countries in the form of aid/donations, aggressive sales practices, poor assessment of pesticide requirements and inability to forecast pest outbreaks, market systems, poorly packaged or labelled products and inappropriate, ineffective or wrong pesticide formulations for local use, inadequate storage facilities and poor stock management (<http://www.fao.org>).

Obsolete pesticides are stockpiled in underground wells called tombs or simple holes, in old warehouses, military bunkers, unsecured ground pits, open sheds in the field, in farms. Many such stocks have seriously deteriorated and are currently a source of severe pollution, a threat to human health (scattered uncontrolled rural stockpiling, both long term exposure of local population and risk of fires etc.) and the environment (especially groundwater, drinking water). In many countries unquantified amounts of soil and building materials have been heavily contaminated by pesticides leaking from inadequate storage facilities.

To combat the problem of obsolete pesticides a further accumulation of obsolete pesticide stocks has to be prevented. Inventories of obsolete pesticide stocks have to be carried out, followed by a safe and environmentally sound disposal of bulk quantities of obsolete pesticides. The local responsible people have to be trained on pesticide stock management so that the risk for the environment can be reduced. Further, FAO called upon its members to apply Integrated Pest Management (IPM) and to reduce the use of pesticides, where this is possible.

Historical changes in the NIS and CEEC caused that together with the advent of market economy the further accumulation of expired or obsolete pesticides has come to a halt. But these countries still have not solved the problem of safe storage for these pesticides, they have only poor

information concerning the quantity and they are lacking the technical and/or financial resources for the safe disposal.

Inventories on obsolete pesticides are nearly finished in the Baltic States and Poland. A review on obsolete pesticides in Eastern and Central Europe (including Poland and Lithuania), which covers *inter alia* an overview on obsolete pesticides elimination technologies and an assessment of their applicability, legal aspects, a review of present obsolete pesticide project, and recommendations for future obsolete pesticide policy has been submitted to the Danish Environmental Protection Agency (DANCEE, 2001).

### Stocks of obsolete pesticides in selected countries of the Contracting Parties

Although many of the priority hazardous pesticides are not used anymore, old stocks are still remaining in the countries. In 1996 the number of identified unsafe pesticide storage sites was about 1500 in the three Baltic States (about 900 in Lithuania, 422 in Latvia and 200 in Estonia)<sup>1</sup>. Since 1996 in all three countries programs have been carried out to identify these pesticides, re-pack it and store it under safe conditions. In Estonia and Latvia the obsolete pesticides were transported to one central storage place. Between 1992 and 1995, in Lithuania the obsolete stocks were stored under the responsibility of the local authorities in at least 42 places. Due to inappropriate management about 30 cases of spontaneous fires occurred. After 1995 the Lithuanian Ministry of the Environment started to co-ordinate the pesticide related activities. The current amount of accumulated old stocks is 445 t in Estonia (unknown amount not yet identified)<sup>2</sup>, 2060 t in Lithuania (214 t banned pesticides and 1350 t not yet identified)<sup>3</sup> and 1480 t in Latvia (130 tons mixed, not identified)<sup>4</sup>.

Examples for existing stocks of banned pesticides [tons]:

	Estonia 2000	Latvia 2000	Lithuania 1996
DDT	6	172	9
Mercury products (e.g. Granosan)	77	43	1.7
HCH products (e.g. Lindane, Fentiram)	3	155	45
Nitrophen	1.3	22	10

Latvia and Lithuania reported within the questionnaire on the following amounts of stockpiled obsolete pesticides [tons]:

	Latvia	Lithuania
DDT	108.315	16.886
Hexachlorobenzene and products		18.618
Lindane and products	16.6	50.328
Nitrophen		62.166
PCP		0.553
Quintozene and products		40.656
Toxaphene	3.819	

<sup>1</sup> Minutes from the 2<sup>nd</sup> BEF Workshop on Hazardous Waste Management, October 14<sup>th</sup>-15<sup>th</sup>, 1996, Riga

<sup>2</sup> Estonian Ministry of the Environment; Inventory List of the PALDISKI (Estonia) Intermediate Storage, 1.1.2000 (unpublished)

<sup>3</sup> A.Cepele, Ministry of the Environment of Lithuania; Management of obsolete Pesticides in Lithuania, 2000

<sup>4</sup> State Enterprise BAO; Input-Output balance of the intermediate storage site GARDENE (Latvia), 1.6.-30.6.2000

Other estimations about the current amount of accumulated old pesticides in these countries are 700 t in Estonia, 1500 – 2000 t in Latvia and 3280 – 4500 t in Lithuania, with 3500 t of polluted soil (Holoubek et al., 2000; DANCEE, 2001).

In Poland, the amount of unwanted pesticides is estimated at about 60000 tons - about 10000 tons in tombs, another 25000 tons at stores and about 25000 tons at individual farms. It is assumed that 160000 tons are stored in former production sites (Holoubek et al., 2000). A direct spread from these stocks leads to contamination of the surrounding soil and poses a threat to the groundwater. There are approximately the following amounts of obsolete pesticides stockpiled: 400 t DDT, 190 t Toxaphene, 40 t Aldrin/Dieldrin, 37 t Hexachlorobenzene, 1 t Heptachlor, 100 t HCH/Lindane, and 20 t Kelevan.

For the Russian Federation, the amount of unwanted pesticides is estimated to be 20000 tons (Holoubek et al., 2000). The total amount of DDT in registered tombs and stores exceeds 600000 kg. These tombs are in a bad condition and leakage is possible.

It is assumed that several 100000 tons of obsolete pesticides exist in the area of former East Germany, which could leach from big dumpsites into groundwater (Holoubek et al., 2000).

The problem of obsolete pesticides is obviously of serious concern and should be further addressed in the future.

### **Other uses**

Some of the pesticides (1,2-Dibromoethane, Acrylonitrile, Fluoroacetic acid and derivatives, and Hexachlorobenzene) have additional other uses. These uses are described in detail under the respective pesticides.

Lindane is still used as wood preservative in forestry and timber processing industry in Germany, and PCP for the same purpose in Lithuania. All other Contracting Parties reported that there is no further use of Lindane and PCP in forestry and timber processing industry.



## 2. THE PESTICIDES

The following chapter is dealing in alphabetical order with all pesticides selected for immediate priority action. As already indicated in the title of this report, the main focus is on use and legislation/regulatory status. The details are mainly based on the information submitted by the Contracting Parties (Denmark, Estonia, European Community, Finland, Germany, Latvia, Lithuania, Poland, Russia and Sweden) via a questionnaire.

### 1,2-DIBROMOETHANE

(CAS-NO. 106-93-4)

**Synonyms/tradenames:** EDB; Ethylene Dibromide; Glycol Dibromide; Dowfume W 85; Bromofume; Celmide; E-D-Bee; Kopfume; Nephis; DBE; dowfume 40; EDB-85; fumo-gas; iscobrome d; pestmaster; soilbrom-40; soilfume; unifume; Aadibroom; Dibromoethylene; Garden dowfume

**Formula:** C<sub>2</sub>H<sub>4</sub>Br<sub>2</sub>

#### GENERAL BACKGROUND AND USE

Use patterns are non-dispersive and wide dispersive. 1,2-Dibromoethane is used in agricultural industry, chemical industry (in synthesis e.g. of dyes and pharmaceuticals), fuel industry, fuel additives, intermediates and pesticides (insecticide, nematicide) (IUCLID, 1996).

BUA estimated emissions into waters from DBE production (1989) at roughly 4 tons/year in Western Europe. Furthermore, BUA estimated atmospheric emissions in 1989 to be:

Production of 1,2-Dibromoethane	15	t/y
Production of carburetor fuels	0.07	t/y
Storage, loading, transport, fueling of motor vehicles	0.48 – 1.9	t/y
Evaporation from vehicle tanks and carburetors	3.7	t/y
Via vehicle exhausts	0.6 – 55	t/y
Aviation gasoline (2 % of automobile emissions)	0.4 – 1.5	t/y

(source: IUCLID 1996, CD)

#### REGULATORY STATUS

Denmark	pesticide prohibited according to international obligations regulation No. 3 (see Annex)
Estonia	banned 1999
Finland	never been registered or used (no intended uses) use and marketing as pesticide banned since 1996 no production, use and stockpiling
Germany	complete ban of use for pesticides was never registered as a plant protection product (since 1968) never sold as a plant protection product on the German market import of planting material containing the substance prohibited

production and marketing as pesticide is prohibited  
regulations No. 1, 2, 3, 4, 5, 6, 7, 8 (see Annex)

- Latvia no registration/licensing for plant protection use (banned 2000)  
no info about use as industrial chemical  
no use, no stockpiling  
regulations No. 1, 2 (see Annex)
- Lithuania no registration as pesticide  
import, production and use as pesticide is banned  
marketing restricted  
permission necessary for import and export  
regulations No. 1, 2, 3, 4 (see Annex)
- Poland not registered and permitted for marketing and use as a pesticide since 1965  
legally banned for marketing/use as plant protection product since 1996  
import not possible (except for scientific purposes)  
possible losses to the environment are not known  
presumably no production and export  
regulations No. 1, 2 (see Annex)
- Russia not registered as a plant protection product  
no info available concerning the registration as wood preservative or biocide  
production is banned since 1997, also banned for marketing and use  
no info available concerning import  
probably no use and no stockpiling  
regulations No. 1, 5, 6, 7, 8, 9, 10, 11 (see Annex)
- Sweden never been used as a pesticide  
prohibited by EC  
permit required for professional imports from countries not being members of the  
EU as well as for professional transfer  
may not be used in chemical products, which are placed on the market to be sold to  
the general public  
regulations No. 1, 2, 3, 4 (see Annex)  
raw material for synthesis, fuels, fuel additives; less than five products are  
registered on the market, no product is available for consumer use  
4-5 tons were imported/produced in Sweden in 1998 (Source; Keml products  
Register)

## 2,4,5-T

(CAS-NO. 93-76-5)

**Synonyms/tradenames:** Trioxone; (2,4,5-trichlorophenoxy)acetic acid

**Formula:** C<sub>8</sub>H<sub>5</sub>Cl<sub>3</sub>O<sub>3</sub>

### GENERAL BACKGROUND AND USE

This compound is a selective weed killer and was used as a defoliating agent in the Vietnam conflict. (Agent Orange was a 50:50 mixture of 2,4,5-trichlorophenoxyacetic acid and 2,4-dichlorophenoxyacetic acid.) 2,4,5-T is a post-emergence herbicide with growth hormone-type action (affects cellular division, activates phosphate metabolism and/or modifies nucleic acid metabolism). Commercial samples may be contaminated with extremely toxic tetrachlorodioxins and 2,4-D. The teratogenicity and carcinogenic risk is due in part to 2,3,7,8-TCDD, which is present as a contaminant. 2,4,5-T is persistent, has a bioaccumulation potential, and forms highly toxic substances upon thermolysis.

[http://ntp-db.niehs.nih.gov/NTP\\_Reports/NTP\\_Chem\\_H&S/NTP\\_Chem9/Radian93-76-5.txt](http://ntp-db.niehs.nih.gov/NTP_Reports/NTP_Chem_H&S/NTP_Chem9/Radian93-76-5.txt)

<http://www.g-o.de/geo->

[bin/frameset.pl?id=00001&frame1=titelgo.htm&frame2=menue04.htm&frame3=kap4/40ec0023.htm](http://www.g-o.de/geo-bin/frameset.pl?id=00001&frame1=titelgo.htm&frame2=menue04.htm&frame3=kap4/40ec0023.htm)

<http://www.fao.org/ag/AGP/AGPP/Pesticid/PIC/dgdhome.htm>

### REGULATORY STATUS

Denmark	pesticide not approved for use not in use since 1979
Estonia	banned 1999
Finland	marketing and use was banned in 1977 no import, (probably) no stockpiles left
Germany	completely banned for use as a plant protection product was registered until 1985 import of planting material containing the substance prohibited regulations No. 3, 5, 7, 8 (see Annex)
Latvia	no registration/licensing for plant protection use no use, no stockpiling regulations No. 1, 4, 5, 6 (see Annex)
Lithuania	not registered as pesticide banned as pesticide no remains/stockpiles regulation No. 1 (see Annex)
Poland	not registered and permitted for marketing and use as a pesticide since 1985 legally banned for marketing/use as plant protection product since 1996 import not possible (except for scientific purposes) possible losses to the environment are not known presumably no production and export regulations No. 1, 2 (see Annex)

Russia	no info available concerning the registration as plant protection product, wood preservative or biocide no info available concerning production, import, marketing and use probably no use and no stockpiling
Sweden	banned 1977

## ACRYLONITRILE

(CAS-NO. 107-13-1)

**Synonyms/tradenames:** Acrylon; Vinyl cyanide; 2-Propenenitrile

**Formula:** C<sub>3</sub>H<sub>3</sub>N

### GENERAL BACKGROUND AND USE

Use pattern (IUCLID, 1996): basic industry, chemical industry (used in synthesis), paints, lacquers, varnishes industry, polymers industry, textile processing industry, intermediates and others. This compound is used in the manufacture of e.g. acrylic and modacrylic fibers, acrylostyrene plastics, chemicals, adhesives and surface coatings. It is also a chemical intermediate in the synthesis of antioxidants, pharmaceuticals, dyes, textile fibers, etc. In organic synthesis, it is used to introduce a cyanoethyl group; as a modifier for natural polymers and in the cyanoethylation of cotton. In synthetic soil blocks (acrylonitrile polymerised in wood pulp), it is used as a grain fumigant and a pesticide. Its usage in agriculture is now very limited.

[http://ntp-server.niehs.nih.gov/htdocs/CHEM\\_H&S/NTP\\_Chem1/Radian107-13-1.html](http://ntp-server.niehs.nih.gov/htdocs/CHEM_H&S/NTP_Chem1/Radian107-13-1.html)

### REGULATORY STATUS

Denmark	pesticide never approved for use
Estonia	banned 1999
Finland	never been registered or used as pesticide no import and production as pesticide, no stockpiles mainly used in production of latexes for paper coating no import/export/production data for paper industry available
Germany	completely banned for use as pesticide registered in West-Germany until 1974 as a storage preservative import of planting material containing the substance prohibited regulations No. 1, 3, 4, 5, 6, 7, 8 (see Annex)
Latvia	no registration/licensing for plant protection use (but use as industrial chemical) banned for marketing: 01.01.2001; allowed to sell if conc. in product < 0.1% not banned for production and import in use, stockpiling: 2142.3 t/a <sup>5</sup> regulations No. 2 (see Annex)
Lithuania	no registration as pesticide marketing restricted permission necessary for import and export emission of 3.499 t/a from acrylic yarn production regulations No. 1, 2, 3, 4 (see Annex)
Poland	not registered and permitted for marketing and use as a pesticide since 1965 legally banned for marketing/use as plant protection product since 1996 import not possible (except for scientific purposes) possible losses to the environment are not known

<sup>5</sup> It has to be clarified whether this is an old pesticide stock or a stock of raw material for industrial use.

presumably no production and export  
regulations No. 1, 2 (see Annex)

Russia not registered as plant protection product  
no info available concerning the registration as wood preservative or biocide  
no info available concerning production, import, marketing and use  
probably no use and no stockpiling

Sweden never been used as pesticide  
permit required for professional imports from countries not being members of the  
EU as well as for professional transfer  
may not be used in chemical products, which are placed on the market to be sold to  
the general public  
regulations No. 1 (Effectiveness not fully evaluated), 2, 3, 4 (see Annex)  
use areas: raw material for synthesis, binding agent, fillers in plastic materials  
in 1998, 110 products were registered, 6 products available for consumers in 1996  
2500 - 2900 tons were imported/produced in 1998

## ARAMITE

(CAS-NO. 140-57-8)

**Synonyms/tradenames:** Sulfurous acid 2-chloroethyl 2-[4-(1,1-dimethylethyl)phenoxy] 1-methylethyl ester; 2-chloroethyl 2-(4-(1,1-dimethylethyl)phenoxy)-1-methylethyl sulfite; Aracide; Niagaramite; Sulfurous acid, 2-(p-t-butylphenoxy)-1-methylethyl-2-chloroethyl ester

**Formula:** C<sub>15</sub>H<sub>23</sub>ClO<sub>4</sub>S

### GENERAL BACKGROUND AND USE

Aramite is an extremely efficient miticide/acaricide used in the protection of fruits, vegetable and non-food plant crops from the predations of mites (IRPTC). Used also as insecticide and antimicrobicide agent.

### REGULATORY STATUS

Denmark	pesticide never approved for use
Estonia	banned 1999
Finland	never been registered or used (no intended uses) no import, no production, no stockpiles
Germany	complete ban for the use as a plant protection product was never registered as a plant protection product (since 1968) import of planting material containing the substance prohibited regulations No. 3, 7 (see Annex)
Latvia	no registration/licensing for plant protection use no use, no stockpiling regulations No. 1, 4, 5, 6 (see Annex)
Lithuania	not registered as pesticide banned since 1987 no remains/stockpiles
Poland	not registered and permitted for marketing and use as a pesticide since 1965 legally banned for marketing/use as plant protection product since 1996 import not possible (except for scientific purposes) possible losses to the environment are not known presumably no production and export regulation No. 2 (see Annex)
Russia	no info available concerning the registration as plant protection product, wood preservative or biocide no info available concerning production, import, marketing and use probably no use and no stockpiling
Sweden	never registered or used

## BETA-HCH

(CAS-NO. 319-85-7)

**Synonyms/tradenames:** beta-1,2,3,4,5,6-Hexachlorocyclohexane; beta-lindane; benzene-cis-hexachloride; beta-benzene hexachloride (BHC)

**Formula:** C<sub>6</sub>H<sub>6</sub>Cl<sub>6</sub>

### GENERAL BACKGROUND AND USE

HCH consists of a group of 8 isomers monocyclic chlorinated hydrocarbon compounds. Technical HCH contains 65 - 70 % alpha-HCH, 10 % beta-HCH, 15 % gamma-HCH and 7% sigma-HCH. Only the gamma-isomer has insecticidal properties (discovered in 1940). Consequently, the gamma-isomer was isolated in manufacture and sold as the odourless insecticide lindane. In contrast, technical grade HCH has a strong musty odour and flavour, which can be imparted to treated crops and animal products (<http://ipmworld.umn.edu/chapters/ware.htm>).

### REGULATORY STATUS

Denmark	banned in 1994 regulation No. 3 (see Annex)
Estonia	no information available
Finland	no information submitted
Germany	completely banned for use as a plant protection product not registered since 1974 regulations No. 3, 5, 7 (see Annex)
Latvia	no registration/licensing for plant protection use (banned 1986, 2000) no info about use as industrial chemical no use, no stockpiling regulation No. 1 (see Annex)
Lithuania	not registered as pesticide banned as pesticide no remains/stockpiles regulation No. 1 (see Annex)
Poland	not registered and permitted for marketing and use as a pesticide since 1965 not referred to in Polish legislation (only technical HCH)
Russia	not registered as a plant protection product no info available concerning the registration as wood preservative or biocide production is banned since 1987, no info concerning import, marketing and use probably no use and no stockpiling regulations No. 1, 2, 8 (see Annex)
Sweden	never registered or used



## CHLORDANE

(CAS-NO. 57-74-9)

**Synonyms/tradenames:** 1,2,4,5,6,7,8,8-octachloro-3a,4,7,7a-tetra-hydro-4,7-methan-; oindane; 1,2,4,5,6,7,8,8-Octachloro-4,7-Methano-3a,4,7,7a-Tetrahydroindane

**Formula:** C<sub>10</sub>H<sub>6</sub>Cl<sub>8</sub>

### GENERAL BACKGROUND AND USE

Heptachlor is one of the most active components of technical chlordane, while technical heptachlor is used as a pesticide. The cyclodiene chlordane, which appeared after World War II in 1945, was used for the control of cockroaches, ants, termites and other household pests. Chlordane is a persistent, non-systemic contact and stomach insecticide with some fungicidal activity. It is not produced in Europe and Japan. This persistent organochlorine insecticide was used world-wide and mostly in USA, south-eastern Asia and Australia. Technical chlordane was used for a short time and in small quantities in the past in Poland, and also in the Scandinavian countries up to 1960s (Holoubek et al., 2000). The half-life of chlordane in soil has been reported to be approximately one year. This persistence, combined with a high partition coefficient ( $\log K_{ow} = 6.00$ ), provides the necessary conditions for chlordane to bind to aquatic sediments and to bioconcentrate in organisms. Bioconcentration factors of 37800 for fathead minnows and 16000 for sheepshead minnow have been reported (IPCS, 1996). Of particular concern is its demonstrated carcinogenic response in laboratory rodents and its potential impact on human health from widespread environmental contamination in the food chain.

<http://www.fao.org/ag/AGP/AGPP/Pesticid/PIC/dgdhome.htm>

### REGULATORY STATUS

In EEC-countries Chlordane is banned as agricultural chemical since 1988.

Denmark	pesticide never approved for use
Estonia	banned 1967
Finland	marketing and use was banned in 1969 (exemptions ceased 1993) no import, no production, (probably) no stockpiles left
Germany	banned as active ingredient in plant protection products completely banned for any use since 1977 was never registered in Ex-GDR, registered in FRG until 1971 import of planting material containing the substance prohibited regulations No. 3, 5, 7 (see Annex)
Latvia	no registration/licensing for plant protection use (banned 2000) regulation No. 1 (see Annex)
Lithuania	not registered as pesticide (banned) no remains/stockpiles regulation No. 1 (see Annex)
Poland	not registered and permitted for marketing and use as a pesticide since 1965 legally banned for marketing/use as plant protection product since 1996

import not possible (except for scientific purposes)  
possible losses to the environment are not known  
presumably no production and export  
regulations No. 1, 2 (see Annex)

Russia	no info available concerning the registration as plant protection product, wood preservative or biocide no info available concerning production, import, marketing and use probably no use and no stockpiling
Sweden	banned 1971

## CHLORDECONE (KEPONE)

(CAS-NO. 143-50-0)

**Synonyms/tradenames:** Decachloroketone; Merex; 1,3,4-Metheno-2H-cyclobuta(cd)pentalen-2-one, 1,1a,3,3a,4,5,5a,5b,6-decachlorooctahydro-; Decachlorooctahydro-1,3,4-metheno-2H-cyclobuta(c,d)-pentalen-2-one

**Formula:** C<sub>10</sub>Cl<sub>10</sub>O

### GENERAL BACKGROUND AND USE

This halogenated pesticide is/was used as an insecticide, fungicide, acaricide, larvicide for control of the banana root borer and tobacco wireworm and bait for control of ants and cockroaches. It is normally used in the monohydrate to trihydrate form.

([http://ntp-server.niehs.nih.gov/htdocs/CHEM\\_H&S/NTP\\_Chem1/Radian143-50-0.html](http://ntp-server.niehs.nih.gov/htdocs/CHEM_H&S/NTP_Chem1/Radian143-50-0.html) ;  
<http://www.speclab.com/compound/c143500.htm>)

### REGULATORY STATUS

Denmark	pesticide never approved for use
Estonia	banned 1999
Finland	never been registered or used, no intended uses no import, no production, no stockpiles
Germany	completely banned for use as a plant protection product was never registered as a plant protection product (since 1968) import of planting material containing the substance prohibited regulations No. 3, 5, 7 (see Annex)
Latvia	no registration/licensing for plant protection use no use, no stockpiling regulations No. 1, 4, 5, 6 (see Annex)
Lithuania	not registered as pesticide (banned) no remains/stockpiles regulation No. 1 (see Annex)
Poland	not registered and permitted for marketing and use as a pesticide since 1965 legally banned for marketing/use as plant protection product since 1996 import not possible (except for scientific purposes) possible losses to the environment are not known presumably no production and export regulation No. 2 (see Annex)
Russia	no info available concerning the registration as plant protection product, wood preservative or biocide no info available concerning production, import, marketing and use probably no use and no stockpiling
Sweden	banned 1978

## CHLORDIMEFORM

(CAS-NO. 6164-98-3)

**Synonyms/tradenames:** N'-(4-chloro-2-methylphenyl)-N,N-dimethylmethanimidamide; Fundex; Fundal; Galecron; Chlorophenamidine; Acaron; Bermat; CDM; Ovatoxion; Dimethyl-N'-(2-methyl-4-chlorophenyl)formamidine; Formamidine, N'-(4-chloro-o-tolyl)-N,N-dimethyl-; RS-141; Spanone

Formula:  $C_{10}H_{13}ClN_2$

### GENERAL BACKGROUND AND USE

Chlordimeform is one of only two commercially used members of the newer class of insecticides called formamidines. Introduced into commercial production in 1966 by Ciba-Geigy, Ltd. of Switzerland and by Schering, AG of West-Germany this insecticide-acaricide-ovicide quickly became a popular replacement for organochlorines and organophosphates that experienced insect resistance. In 1976, Ciba-Geigy and Schering withdrew the pesticide from the market. They reissued the product in 1978 with a label change that forbids all uses worldwide except in cotton, and only then with severe restrictions on application. Chlordimeform controls pests as a contact and stomach poison, as well as through vapour action. Like most other organic insecticides, it appears to act against insect nervous systems, but its precise mode of action is not known. Chlordimeform and its principal metabolites are considered probable human carcinogens.

<http://www.alternatives.com/library/env/envchem/chlordim.txt>

<http://www.fao.org/ag/AGP/AGPP/Pesticid/PIC/dgdhome.htm>

### REGULATORY STATUS

Denmark	pesticide never approved for use
Estonia	banned 1999
Finland	never been registered or used as pesticide no import, no production, no stockpiles
Germany	completely banned for use as a plant protection product was registered in FRG until 1976, in Ex-GDR until 1981 import of planting material containing the substance prohibited regulations No. 3, 7 (see Annex)
Latvia	no registration/licensing for plant protection use no use, no stockpiling regulations No. 1, 4, 5, 6 (see Annex)
Lithuania	not registered as pesticide (banned) no remains/stockpiles regulation No. 1 (see Annex)
Poland	not registered and permitted for marketing and use as a pesticide since 1977 legally banned for marketing/use as plant protection product since 1996 import not possible (except for scientific purposes) possible losses to the environment are not known presumably no production and export regulation No. 2 (see Annex)
Russia	not registered as plant protection product

no info available concerning the registration as wood preservative or biocide  
no info available concerning production, import, marketing and use  
probably no use and no stockpiling

Sweden never registered or used

## DDT

(CAS-NO. 50-29-3)

**Synonyms/tradenames:** Dicophane; 4,4'-DDT; 2,2-bis(p-chlorophenyl)-1,1,1-trichloroethane; 4,4'-2,2,2-trichlorobis(4-chlorophenyl)ethane; 1,1,1-trichloro-2,2-bis(4-chlorophenyl)ethane; 1,1'-(2,2,2-trichloroethylidene)bis[4-chlorobenzene]; Anofex, Cesarex, Chlorophenothane, Dedelo, p,p'-DDT, Dichlorodiphenyltrichloroethane, Dinocide, Didimac, Digmar, ENT 1506, Genitox, Guesapon, Guesarol, Gexarex, Gyron, Hildit, Ixodex, Kopsol, Neocid, OMS 16, Micro DDT 75, Pentachlorin, Rukseam, R50 and Zerdane (etc.)

**Formula:** C<sub>14</sub>H<sub>9</sub>Cl<sub>5</sub>

### GENERAL BACKGROUND AND USE

DDT is a prototype of a persistent organochlorine insecticide with non-systemic stomach and contact effects. Technical grade DDT is a mixture of three forms, p,p'-DDT (85 %), o,p'-DDT (15 %), o,o'-DDT (trace amounts). It was first synthesized in 1874, but it was not used until its insecticidal properties were discovered in 1939. After 1945 it was a widely used chemical to control insects on agricultural crops and those, carrying diseases like malaria and typhus. DDT is no longer used in many countries, including Central and Eastern European countries. However, it is still used in some African, Asian and South American states as a cheap and efficient insecticide. Estonia was one of the first countries around the Baltic Sea, which established an import ban for chlorinated pesticides in 1968 (Holoubek et al., 2000). DDT is persistent (half-life approximately five years), bioaccumulates in the food chain (e.g. BCF for fish 50000; for mussels 500000) and leads to significant reproductive effects in birds, such as the brown pelican, osprey and eagles, because of egg shell thinning. DDT is toxic to a number of organisms including fish, mainly affecting the central and peripheral nervous system and the liver.

<http://www.fao.org/ag/AGP/AGPP/Pesticid/PIC/dgdhome.htm>

DDT was produced in Poland from 1949 to 1980, the average annual volume was 2,500 tons. Total production volume was 77,000 tons. Starting from 1976 total production until 1980 was exported, due to lack of approval for domestic marketing and use (GLOB PPH, 2000). The total volume of the technical DDTs used in Poland from 1974 to 1980 was 48151.7 tons, and the annual rate was up to 3880.6 tons (Holoubek et al., 2000). Production, trade and use of DDT was banned between 1970 and 1975 in most of the countries bordering the Baltic Sea, especially Scandinavia and former West-Germany. Due to this the annual use of DDT between 1973 and 1983 in Sweden dropped from 1000 to 7 tons. Today DDT is not further used in Europe but is still used in agriculture and for vector control (malaria/anti mosquito fogging programs) in some tropical countries (in: Münch & Axenfeld, 1999).

Tab. 1: Historic DDT consumption in Europe [t/y]

Country	1970	1975	1980	1985	1990	1995
Denmark	18.00	0.80	1.20	0.00	0.00	0.00
Estonia	106.08	11.58	8.17	3.54	1.49	0.00
Finland	6.10	0.62	0.67	0.00	0.00	0.00
Germany East	1500.00	33.99	2.78	4.03	0.65	0.00
Germany West	152.00	24.72	0.00	0.00	0.00	0.00
Latvia	306.47	33.46	23.61	10.22	4.29	0.00
Lithuania	365.40	39.89	28.15	12.18	5.12	0.00
Poland	2528.00	16.70	8.78	0.00	0.00	0.00
Portugal	165.00	17.97	13.66	7.60	0.00	0.00
Russia	6000.00	654.99	462.22	200.00	83.99	0.00
Sweden	13.80	0.94	0.00	0.00	0.00	0.00

(in: Münch & Axenfeld, 1999)

## REGULATORY STATUS

In EEC-countries DDT is banned as agricultural chemical since 1988.

Denmark	banned in 1984 regulation No. 4 (see Annex)
Estonia	banned 1967
Finland	marketing and use was banned in 1976 no import, no production, (probably) no stockpiles left
Germany	completely banned was registered in FRG until 1977 for uses in forestry and treatment of onion seeds in Ex-GDR registered until 1988 may not be marketed DDT and some of its metabolites were not detected in several waste water effluents and rivers (Research project no. 297 25 527) regulations No. 1, 3, 5, 8, 9 (see Annex)
Latvia	no registration/licensing for plant protection use (banned 1966, 2000) no info about use as industrial chemical no use, no stockpiling, but collection of 108.315 t hazardous waste regulations No. 1 (see Annex)
Lithuania	not registered as pesticide (banned) stockpiles: 16886 kg in farms regulation No. 1 (see Annex)
Poland	not registered and permitted for marketing and use as a pesticide since 1976 (might be practically considered as ban) legally banned for marketing/use as plant protection product since 1996 import not possible (except for scientific purposes) possible losses to the environment from stockpiling are not known riverine input to the Baltic Sea: 178 kg in 1998 presumably no production and export regulations No. 1, 2 (see Annex)
Russia	not registered as plant protection product, use until 1973 no info about use as industrial chemical, wood preservative, disinfectant, antifouling or as biocide banned for production, import, marketing and use since 1972 not used, not released to the environment total amount in registered tombs and stores exceeds 600000 kg (bad conditions, leakage possible) regulations No. 1, 3 (see Annex)
Sweden	banned 1975

Tab. 2: Legal measures against the use of DDT in European countries

<b>Country</b>	<b>Action</b>	<b>Year</b>	<b>Restrictions/Remaining uses</b>
Denmark	Banned	1984	
E.C.	Severely restricted	1976/ 91	Banned as agricultural chemical
Finland	Banned	1976	
Germany West	Banned	1972	Total ban
Germany East	Restricted	1970	
Poland	Banned	1996	Not registered and permitted for marketing and use as pesticide since 1979.
Sweden	Severely restricted	1970/ 75	Banned as agricultural chemical

(Breivik 1998, in Münch et al., 1999), amended



## “THE DRINS”

### GENERAL BACKGROUND AND USE

Aldrin, dieldrin, endrin and isodrin, also known as "the drins" have been used extensively throughout the world on a wide variety of crops and pests. Today, banned or severely restricted in most industrialized nations, the drins are still used in a number of developing countries.

Dieldrin, a metabolic degradation product of aldrin has been used extensively on most of the same crops and pests as aldrin. It should be noted that aldrin breaks down quite rapidly into its metabolite dieldrin. Consequently, residues found in the environment are principally dieldrin.

Endrin, an isomer of dieldrin, was first synthesized in 1950. It has been used to control pests that destroy leaves and stems of cotton, rice, tobacco, maize, sugar cane and fruit trees, including lepidopterous pests, ants, aphids, armyworms, boll weevils, mites, cutworms, psyllids, sawflies, beetles, grasshoppers and leaf miners. It has also been used as a rodenticide against meadow mice and voles, for protection of forest seed against birds, mice and chipmunks and for the control of birds on buildings.

Dieldrin and aldrin were imported in small quantities (< 100 tons) and used in Poland between 1985 and 1971 (Holoubek et al., 2000).

### REGULATORY STATUS

The drins are one of the most banned and severely restricted "Dirty Dozen" pesticides. Aldrin is banned in 12 countries and severely restricted in 17, as well as the entire European Economic Community (EEC). Dieldrin is banned in 15 countries, as well as the EEC, and is severely restricted in 15. Endrin is banned in 14 countries and severely restricted in 17, including the EEC.

<http://www.alternatives.com/libs/envchem.htm>

## ALDRIN

(CAS-NO. 309-00-2)

**Synonyms/tradenames:** 1,2,3,4,10,10-hexachloro-1,4,4a,5,8,8a-hexahydro-exo-1,4-endo-5,8-dimethanonaphthalene; Aldrite; Aldrosol; HHDN; Seedrin; Aldrex; 1,4:5,8-Dimethanonaphthalene, 1,2,3,4,10,10-hexachloro-1,4,4a,5,8,8a-hexahydro-(1 $\alpha$ 4 $\alpha$ ,4 $\beta$ ,5 $\alpha$ ,8 $\alpha$ ,8 $\beta$ )-; drinox; hexachlorohexahydro-endo-exo-dimethanonaphthalene; octalene compound 118; Kortofin; OMS-194; Tatuzinho; Tipula.

**Formula:** C<sub>12</sub>H<sub>8</sub>Cl<sub>6</sub>

### GENERAL BACKGROUND AND USE

Aldrin has been used mainly against insects, primarily soil insects and termites. It was used for wood preservation and to combat ant infestations. It affects the central nervous system and produces convulsions. Aldrin and dieldrin, to which the compound is readily converted in the environment, are highly toxic (especially to fish). Aldrin residues are rarely present in animals and then only in very small amounts. But it persists in the environment, and bioaccumulates in the food chain and in human tissues as dieldrin.

<http://www.speclab.com/compound/c309002.htm>

<http://www.fao.org/ag/AGP/AGPP/Pesticid/PIC/dgdhome.htm>

### REGULATORY STATUS

In EEC-countries all uses are prohibited since 1988 except for treating growing media of container-grown ornamental, treatment of potatoes grown on former pastureland in the United Kingdom, and treatment of narcissi against specified pests.

Denmark	pesticide use withdrawn in 1963 prohibited according to international obligations regulation No. 3 (see Annex)
Estonia	banned 1967
Finland	marketing and use was banned in 1972 no import, no production, (probably) no stockpiles left
Germany	complete ban as a plant protection product since 1981 before import as insecticide "Octalene" registered until 1979 for special exemptions for plant protection use in FRG never registered in Ex-GDR import of planting material containing the substance prohibited regulations No. 1, 3, 5, 7, 8 (see Annex)
Latvia	no registration/licensing for plant protection use (banned: 1972, 2000) no use, no stockpiling regulation No. 1 (see Annex)
Lithuania	not registered as pesticide use banned in 1987 no remains/stockpiles regulation No. 1 (see Annex)

Poland	<p>not registered and permitted for marketing and use as a pesticide since 1976  legally banned for marketing/use as plant protection product since 1996  import not possible (except for scientific purposes)  possible losses to the environment are not known  presumably no production and export  regulations No. 1, 2 (see Annex)</p>
Russia	<p>not registered as a plant protection product  no info available concerning the registration as wood preservative or biocide  production is banned since 1980, also banned for marketing and use  no info available concerning import  probably no use and no stockpiling  regulations No. 1, 17 (see Annex)</p>
Sweden	<p>banned 1970</p>

## DIELDRIN

(CAS-NO. 60-57-1)

**Synonyms/tradenames:** 3,4,5,6,9,9-hexachloro-1a,2,2a,3,6,6a,7,7a-octahydro-2,7:3,6-Dimethanonaphth[2,3-b]oxirene; hexachloroepoxyoctahydro-endo,exo-dimethanonaphthalene; Dieldrex; Dieldrite; illoxol; 1,2,3,4,10,10-hexachloro-6,7-epoxy-1,4,4a,5,6,7,8,8a-octahydro-exo-1,4-endo-5,8-dimethanonaphthalene; panoram D-31; octalox; Aldrin epoxide; Dimethanonaphth[2,3-b]-oxirene, HEOD; Alvit; Oxralox; Quintox (etc.)

**Formula:** C<sub>12</sub>H<sub>8</sub>Cl<sub>6</sub>O

## GENERAL BACKGROUND AND USE

Dieldrin is a broad-spectrum insecticide used to termite control by direct soil injection and non-food seed and plant treatment. It was used in tropical countries as a residual spray on the inside walls and ceilings of homes for the control of vectors of diseases, mainly malaria. Industrial uses include timber preservation, termite-proofing of plastic and rubber coverings of electrical and telecommunication cables, of plywood and building boards and as a termite barrier in building construction. Dieldrin affects the central nervous system and produces convulsions. Dieldrin and Aldrin, which rapidly converts to Dieldrin in the environment, are highly toxic (especially to fish), persistent in the environment (half-life in soil approximately five years), and bioaccumulate in the food chain and in human tissues. Bioconcentration factors of 12500 and 13300 have been reported for guppies and sculpins, respectively (IPCS, 1996).

<http://www.speclab.com/compound/c60571.htm>

<http://www.fao.org/ag/AGP/AGPP/Pesticid/PIC/dgdhome.htm>

## REGULATORY STATUS

In EEC-countries Dieldrin is banned as agricultural chemical since 1988.

Denmark	last sale in 1988 prohibited according to international obligations regulation No. 3 (see Annex)
Estonia	banned 1967
Finland	marketing and use was banned in 1972 no import, no production, (probably) no stockpiles left
Germany	complete ban as a plant protection product registered in FRG until 1971; never registered in Ex-GDR import of planting material containing the substance prohibited regulations No. 1, 3, 5, 7, 8 (see Annex)
Latvia	no registration/licensing for plant protection use (banned 2000) no use, no stockpiling regulation No. 1 (see Annex)
Lithuania	not registered as pesticide (banned 1987) no remains/stockpiles regulation No. 1 (see Annex)
Poland	not registered and permitted for marketing and use as a pesticide since 1976

legally banned for marketing/use as plant protection product since 1996  
import not possible (except for scientific purposes)  
possible losses to the environment are not known  
presumably no production and export  
regulations No. 1, 2 (see Annex)

Russia no information submitted

Sweden banned 1970

## ENDRIN

(CAS-NO. 72-20-8)

**Synonyms/tradenames:** Mendrin; Nendrin; Hexadrin; 1,4:5,8-Dimethanonaphthalene, 3,4,5,6,9,9-Hexachloro-1a,2,2a,3,6,6a,7,7a-octahydro-2,7:3,6-dimethanonaphth[2,3-b]oxirene; Compound 269; 1,2,3,4,10,10-hexachloro-6,7-epoxy-1,4,4a,5,6,7,8,8a-octahydro-endo,endo-;

**Formula:** C<sub>12</sub>H<sub>8</sub>Cl<sub>6</sub>O

### GENERAL BACKGROUND AND USE

Endrin has been used as a foliar insecticide to control a wide range of insects on field crops such as cotton and grains (<http://www.speclab.com/compound/c72208.htm>). It has also been used as a rodenticide to control mice and voles and as an avicide. It is rapidly metabolised by animals and does not accumulate in fat to the same extent as other compounds with similar structures. The half-life of endrin in soil may be up to 12 years, depending on local conditions. A bioconcentration factor of 6400 was recorded for sheepshead minnows exposed to endrin from embryonic stage through adulthood (IPCS, 1996).

### REGULATORY STATUS

Denmark	pesticide never approved for use prohibited according to international obligations regulation No. 3 (see Annex)
Estonia	banned 1967
Finland	marketing and use was banned in 1969 no import, no production, (probably) no stockpiles left
Germany	complete ban as a plant protection product in FRG registered until 1982 (field mice); in Ex-GDR until 1969 import of planting material containing the substance prohibited regulations No. 1, 3, 5, 7, 8 (see Annex)
Latvia	no registration/licensing for plant protection use (banned 2000) no use, no stockpiling regulation No. 1 (see Annex)
Lithuania	not registered as pesticide (banned) no remains/stockpiles regulation No. 1 (see Annex)
Poland	not registered and permitted for marketing and use as a pesticide since 1971 legally banned for marketing/use as plant protection product since 1996 import not possible (except for scientific purposes) possible losses to the environment are not known presumably no production and export regulation No. 2 (see Annex)
Russia	no information submitted
Sweden	banned 1966

## ISODRIN

(CAS-NO. 465-73-6)

**Synonyms/tradenames:** Hexachlorohexahydro-endo,endo-dimethanonaphthalene; 1,2,3,4,10,10-Hexachloro-1,4,4a,5,8,8a-hexahydro-1,4,5,8-dimethanonaphthalene

**Formula:** C<sub>12</sub>H<sub>8</sub>Cl<sub>6</sub>

### GENERAL BACKGROUND AND USE

Insecticide.

### REGULATORY STATUS

Denmark	pesticide never approved for use
Estonia	banned 1999
Finland	never been registered or used no import, no production, no stockpiles
Germany	complete ban of use as a plant protection product never registered in Germany import of planting material containing the substance prohibited regulations No. 1, 3, 7 (see Annex)
Latvia	no registration/licensing for plant protection use (banned 2000) no use, no stockpiling regulations No. 1, 4, 5, 6 (see Annex)
Lithuania	not registered as pesticide
Poland	not registered and permitted for marketing and use as a pesticide since 1965 legally banned for marketing/use as plant protection product since 1996 import not possible (except for scientific purposes) possible losses to the environment are not known presumably no production and export regulation No. 2 (see Annex)
Russia	no information submitted
Sweden	never registered or used

## FLUOROACETIC ACID AND DERIVATES

(CAS-NO. 144-49-0)<sup>6</sup>

**Synonyms/tradenames:** 2-Fluoroacetic acid; Alpha-fluoroacetic acid; Cymonic acid; Gifblaar poison; MFA; Monofluoroacetic acid; Fluoroacetic Acid, 99%

**Formula:** C<sub>2</sub>H<sub>3</sub>FO<sub>2</sub>

### GENERAL BACKGROUND AND USE

Fluoroacetic acid is used as a rodenticide, insecticide and acaricide. It is extremely toxic and the heart and the brain are the organs most prominently affected.

### REGULATORY STATUS

Denmark	pesticide never approved for use
Estonia	banned 1999
Finland	never been registered or used no applications, no intended uses no import, no production, no stockpiles
Germany	complete ban as a plant protection product regulations No. 3, 7, 8 (see Annex)
Latvia	no registration/licensing for plant protection use no info about use as industrial chemical not banned for production, import, marketing and use no use, no stockpiling regulations No. 1, 4, 5, 6 (see Annex)
Lithuania	not registered as pesticide
Poland	not registered and permitted for marketing and use as a pesticide since 1965 legally banned for marketing/use as plant protection product since 1996 import not possible (except for scientific purposes) possible losses to the environment are not known presumably no production and export regulation No. 2 (see Annex)
Russia	not registered as pesticides probably not used, released to the environment or stockpiled
Sweden	not used as pesticide some fluoro compounds were used as wood preservatives (registration/permits were withdrawn in the beginning of the 1990s allowance to use sulfurylfluoride as a pesticide under special conditions for insects in wood; registration permit will cease by the end of the year 2000

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<sup>6</sup> In the Appendices 2 and 3 of the Attachment to HELCOM Recommendation 19/5 Fluoroacetic acid and derivatives were given a wrong CAS-No. (7664-39-3, which belongs to Hydrofluoric Acid).



## HCH

(CAS-NO. 608-73-1)

**Synonyms/tradenames:** 1,2,3,4,5,6-hexachlorocyclohexane; technical Hexachlorocyclohexane, benzenehexachloride (BHC)

**Formula:** C<sub>6</sub>H<sub>6</sub>Cl<sub>6</sub>

### GENERAL BACKGROUND AND USE

In its technical grade, there are five isomers, alpha, beta, gamma, delta and epsilon. Only the  $\alpha$ -isomer has insecticidal properties (discovered in 1940). Consequently, the gamma-isomer was isolated in manufacture and sold as the odourless insecticide lindane. In contrast, technical grade HCH has a strong musty odour and flavour, which can be imparted to treated crops and animal products. Because of its very low cost, HCH is still used in many developing countries (<http://ipmworld.umn.edu/chapters/ware.htm>). World consumption of BHC (in metric tons) was: 42000 in 1970; 28000 in 1971; 25000 in 1972; 30000 in 1973; 25000 in 1974. (<http://www.speclab.com/compound/c608731.htm>) HCH acts as an ingested and contact insecticide, and has some fumigant action. HCH is persistent, bioaccumulates, shows dietary cancer risk, high toxicity and environmental effects.

<http://www.fao.org/ag/AGP/AGPP/Pesticid/PIC/dgdhome.htm>

### REGULATORY STATUS

In EEC-countries HCH-mixed isomers containing less than 99 % of the gamma-isomer are prohibited since 1988.

Denmark	pesticide never approved for use prohibited according to international obligations regulation No. 3 (see Annex)
Estonia	banned 1967
Finland	marketing and use was banned in 1972, 1984, 1987, 1996 (before: use as insecticide) no import, no production, (probably) no stockpiles left
Germany	completely banned for use as a plant protection product not registered since 1974 import of planting material containing the substance prohibited HCH isomers (except Lindane) were not detected in several waste water effluents and rivers (Research project no. 297 25 527) regulations No. 3, 7, 12 (see Annex)
Latvia	no registration/licensing for plant protection use (banned 1986, 2000) no use, no stockpiling regulation No. 1 (see Annex)
Lithuania	not registered as pesticide (banned) no remains/stockpiles regulation No. 1 (see Annex)

Poland	<p>not registered and permitted for marketing and use as a pesticide since 1976</p> <p>legally banned for marketing/use as plant protection product since 1996</p> <p>import not possible (except for scientific purposes)</p> <p>regulations No. 1, 2 (see Annex)</p> <p>possible losses to the environment are not known</p> <p>presumably no production and export</p>
Russia	<p>not registered as a plant protection product</p> <p>no info available concerning the registration as wood preservative or biocide</p> <p>production is banned since 1987, also banned for marketing and use</p> <p>no info available concerning import</p> <p>probably no use and no stockpiling</p> <p>regulations No. 1, 2, 8 (see Annex)</p>
Sweden	<p>never been used as pesticide</p> <p>never registered or used</p>

## HEPTACHLOR

(CAS-NO. 76-44-8)

**Synonyms/tradenames:** 1,4,5,6,7,8,8-Heptachloro-3a,4,7,7a-Tetrahydro-4,7-Methano-1H-Indene; 3,4,5,6,7,8,8a-Heptachlorodicyclopentadiene; Heptachlorotetrahydro-4,7-methanoindene; Velsicol-104; Heptamul; Heptagran; Drinox; 3-Chlorochlordene; Rhodiachlor; Tetrahydro (etc.)

**Formula:** C<sub>10</sub>H<sub>5</sub>Cl<sub>7</sub>

### GENERAL BACKGROUND AND USE

Heptachlor is one of the most active components of technical chlordane, while technical heptachlor is used as an insecticide to combat soil insects and termites. It is a persistent, non-systemic contact and stomach poison with some fumigant action. It has also been used against cotton insects, grasshoppers, some crop pests and to combat malaria. Technical heptachlor also was used for a short time and in small quantities in the past in Poland and also in Finland at rates up to 60 tons annually (Holoubek et al., 2000). Heptachlor is highly toxic (e.g. to fish), bioaccumulates, and is persistent in the environment (up to ten years in soil). Bioconcentration factors of heptachlor and heptachlor epoxide in fathead minnows (*Pimephales promelas*) were 9500 and 14400, respectively (IPCS, 1996). Of particular concern is its demonstrated carcinogenic response in laboratory rodents and its potential impact on human health from widespread environmental contamination in the food chain. <http://www.fao.org/ag/AGP/AGPP/Pesticid/PIC/dgdhome.htm>

### REGULATORY STATUS

In EEC-countries Heptachlor is banned as agricultural chemical since 1988.

Denmark	pesticide never approved for use prohibited according to international obligations regulation No. 3 (see Annex)
Estonia	banned 1967
Finland	marketing and use was banned in 1993 (before: use as wood preservative) no import, no production, (probably) no stockpiles left
Germany	completely banned for use as a plant protection product registered in FRG with restrictions until 1981; never registered in Ex-GDR import of planting material containing the substance prohibited regulations No. 3, 5, 7 (see Annex)
Latvia	no registration/licensing for plant protection use (banned 1986, 2000) no use, no stockpiling regulation No. 1 (see Annex)
Lithuania	not registered as pesticide (banned) no remains/stockpiles regulation No. 1 (see Annex)
Poland	not registered and permitted for marketing and use as a pesticide since 1967 legally banned for marketing/use as plant protection product since 1996 import not possible (except for scientific purposes)

possible losses to the environment are not known  
presumably no production and export  
regulations No. 1, 2 (see Annex)

Russia registered as plant protection product, use until 1975  
no info about use as industrial chemical, wood preservative, disinfectant, antifouling  
or as biocide  
banned for production, import, marketing and use since 1982  
not used, not released to the environment, not stockpiled  
less hazardous substances exist, but not used due to lack of knowledge,  
expensiveness and other reasons  
regulations No. 1, 4 (see Annex)

Sweden never registered or used

## HEXACHLOROBENZENE

(CAS-NO. 118-74-1)

**Synonyms/tradenames:** Perchlorobenzene; HCB; hexa c.b.; Anticarie; Bunt-cure; Bunt-no-more; Ceku C.B.; No Bunt; pentachlorophenyl chloride; julian's carbon chloride; sanocide; smut-go; amatin; co-op hexa; granox nm; Snieciotox; Hexachlorbenzol; Perchlorbenzol.

**Formula:** C<sub>6</sub>Cl<sub>6</sub>

### GENERAL BACKGROUND AND USE

Hexachlorobenzene is a chlorinated aromatic hydrocarbon with moderate volatility. Technical grade HCB contains up to 2 % impurities (1.8 % pentachlorobenzene and 0.2 % 1,2,4,5-tetrachlorobenzene), including higher chlorinated dibenzo-p-dioxins, dibenzofurans and biphenyls (Holoubek et al., 2000).

HCB was widely used as a fungicide for seed protection, soil treatment, as plant protection product and wood protection agent from the beginning of the 50s. It has a fumigant action on fungal spores. Agricultural use of HCB was banned in Belgium, West-Germany, France, The Netherlands, Italy, Denmark, Ireland, and the United Kingdom since the early 1980s (Münch et al., 1999). HCB was imported and used in the past in Poland as fungicide, and the application rates were relatively small (total import was 187.6 tons between 1962 and 1972) (Dabrowski et al., 1994; in: Holoubek et al., 2000).

In industry, HCB is used in the manufacture of various substances (e.g. PCP, Pentachlorothiophenol, pyrotechnical products). HCB can be generated as a by-product during the manufacture of chlorinated pesticides, chlorine and chlorinated solvents. Currently, the principal sources of HCB in the environment are estimated to the manufacture of chlorinated solvents, the manufacture and application of HCB-containing pesticides, and inadequate incineration of chlorine-containing wastes. HCB is a contaminant of a number of chlorinated pesticides (Holoubek et al., 2000).

HCB has a very high persistency in the environment and bioaccumulates in the food chain. The half-life in soil has been estimated at three to six years. HCB is toxic, and probably a human carcinogen. <http://www.fao.org/ag/AGP/AGPP/Pesticid/PIC/dgdhome.htm>

Tab. 3: Historic national HCB emissions in Europe [kg/y]

Country	1970	1975	1980	1985	1990	93-95
Denmark	3180.98	3166.20	3024.04	319.14	131.05	114.92
Estonia	289.46	280.85	181.12	177.35	86.70	70.87
Finland	3159.67	3131.87	2915.34	290.27	127.30	126.30
Germany	0.00	0.00	0.00	0.00	0.00	1554.80
Germany East	7359.65	7616.50	6694.84	1578.83	584.35	0.00
Germany West	13126.46	13352.40	11161.56	3680.45	1069.25	0.00
Latvia	501.21	482.76	308.74	309.62	155.20	128.33
Lithuania	631.20	643.73	436.80	431.48	212.90	175.67
Poland	3907.23	3900.66	2612.14	2634.06	1321.45	930.00
Russia	36092.37	36369.45	24501.02	24375.60	12120.41	10980.00
Sweden	3799.81	3719.74	3492.65	412.70	160.80	161.10

(in: Münch & Axenfeld, 1999)

## REGULATORY STATUS

In the European Union it is prohibited to use or place on the market all plant protection products containing Hexachlorobenzene as an active ingredient since 1979. No remaining uses are allowed.

Denmark	pesticide never approved for use prohibited according to international obligations regulation No. 3 (see Annex)
Estonia	banned 1999
Finland	marketing and use was banned in 1996, not used since 1980 (registration voluntarily withdrawn 1980) no import, no production, (probably) no stockpiles left
Germany	completely banned for use as a plant protection product ban as an additive in plant protection products in 1975 registered until 1973 import of planting material containing the substance prohibited regulations No. 1, 3, 5, 7, 8 (see Annex)
Latvia	no registration/licensing for plant protection use no info about use as industrial chemical banned for import, marketing and use as plant protection product: 25.03.2000 not banned for production no use, no stockpiling regulations No. 1, 2 (see Annex)
Lithuania	no registration as pesticide import, production and use as pesticide is banned (remains could be used till 01.01.2001) marketing restricted permission necessary for import and export, production, trade and storage stockpiling: 303 kg of Hexachlorobenzene, 18315 kg Hexatiurame (contains 30 % of Hexachlorobenzene) in closed farms' storages regulations No. 1, 2, 3, 4 (see Annex)
Poland	not registered and permitted for marketing and use as a pesticide since 1979 legally banned for marketing/use as plant protection product since 1996 import not possible (except for scientific purposes) possible losses to the environment are not known presumably no production and export regulation No. 2 (see Annex)
Russia	no info available concerning the registration as plant protection product, wood preservative or biocide no info available concerning production, import, marketing and use probably no use and no stockpiling
Sweden	banned 1980 (not registered) no longer in use as a.i. in biocides

Tab. 4: Legal measures against the use of HCB in European countries

<b>Country</b>	<b>Action</b>	<b>Year</b>	<b>Restrictions/ Remaining uses</b>
Denmark	HCB banned		Banned as agricultural chemical
E.C.	HCB banned	1978/ 88	EEC Directive 79/177 1981 banned as pesticide
Germany West	HCB banned (total)	1988	1977 HCB banned for seed protection 1982 HCB banned as pesticide
Germany East	HCB severely restrict.	1984	Until 1990 in use
Poland	legal ban of marketing and use as PPP	1996	1979 withdrawn from registers of PPP approved for marketing and use (practical ban of marketing and use as PPP)
Sweden	HCB withdrawn from market	1980	HCB banned as agricultural chemical 1977
U.S.S.R	HCB banned	1986	Banned as agricultural chemical

(Breivik, 1998, in: Münch et al., 1999), amended

## ISOBENZANE

(CAS-NO. 297-78-9)

**Synonyms/tradenames:** 1,3,4,5,6,7,8,8-octachloro-1,3,3a,4,7,7a-hexahydro-4,7-Methanoisobenzofuran; Telodrin; 1,3,4,5,6,7,10,10-Octachloro-4,7-endo-methylene-4,7,8,9-tetrahydrophthalan; Exo-1,exo-3,4,5,6,7,8,8-octachloro-1,3,3a,4,7,7a-hexahydro-endo-4,7-methanoisobenzofuran; Omtan; Octachlorohexahydro-4,7-methanoisobenzofuran;

**Formula:** C<sub>9</sub>H<sub>4</sub>Cl<sub>8</sub>O

### GENERAL BACKGROUND AND USE

Insecticide.

### REGULATORY STATUS

Denmark	pesticide never approved for use
Estonia	banned 1999
Finland	never been registered or used no import, no production, no stockpiles
Germany	complete ban of use as a plant protection product never registered in Germany import of planting material containing the substance prohibited regulations No. 1, 3, 7, 8 (see Annex)
Latvia	no registration/licensing for plant protection use no use, no stockpiling regulations No. 1, 4, 5, 6 (see Annex)
Lithuania	not registered as pesticide no remains/stockpiles
Poland	not registered and permitted for marketing and use as a pesticide since 1965 legally banned for marketing/use as plant protection product since 1996 import not possible (except for scientific purposes) possible losses to the environment are not known presumably no production and export regulation No. 2 (see Annex)
Russia	banned in USSR
Sweden	never registered or used



## KELEVAN

(CAS-NO. 4234-79-1)

### Synonyms/tradenames:

### Formula:

## GENERAL BACKGROUND AND USE

Kelevan, the condensation product of ethyl-levulinate and Kepone, is a chlordane derivative used in a number of countries as an insecticide, mainly for the control of the potato beetle and the banana root borer.

## REGULATORY STATUS

Denmark	pesticide never approved for use
Estonia	banned 1999
Finland	never been registered or used no import, no production, no stockpiles
Germany	complete ban of use as a plant protection product registered in FRG until 1980; in Ex-GDR until 1984 import of planting material containing the substance prohibited regulations No. 3, 7 (see Annex)
Latvia	no registration/licensing for plant protection use no use, no stockpiling regulations No. 1, 4, 5, 6 (see Annex)
Lithuania	not registered as pesticide no remains/stockpiles
Poland	not registered and permitted for marketing and use as a pesticide since 1984 legally banned for marketing/use as plant protection product since 1996 import not possible (except for scientific purposes) possible losses to the environment are not known presumably no production and export regulation No. 2 (see Annex)
Russia	no info available concerning the registration as plant protection product, wood preservative or biocide no info available concerning production, import, marketing and use probably no use and no stockpiling
Sweden	never registered or used

## LINDANE

(CAS-NO. 58-89-9)

**Synonyms/tradenames:** gamma-1,2,3,4,5,6-Hexachlorocyclohexane; gamma-HCH; gamma-hexachlorocyclohexane; Benzene hexachloride;  $\gamma$ -BHC; Isotox; Benhexachlor; Hexachlorane; gamma-benzene hexachloride; gamma hexachlor; Aparasin; Aphtitria; Esoderm; Gammalin; Gammexane; Jacutin; Kwell; Benzex; aficide; agrocide; agronexit; arbitex; aplidal; ameisenatod; BBH; benhexol; bentox 10; Bexol; celanex; chloresene; codechine; DBH; detmol-extrakt; detox 25; dol granule; drill tox-spezial aglukon; devoran; entomoxan; exagama; forlin; forst-nexen; gamacarbatox; gamma-COL; Gammaterr; gammex; gallogama; gamacid; gamaphex; Gammahexa; geobilan; hecoltox; hexatox; hexaverm; hexicide; hilbeech; hexyclan; HGI; hortex; hungaria I7; inexit; kokotine; lasochron; lendine; lentox; lidenal; lindafor; lindagam; lindagrain; lindagranox; lindapoudre; lindex; linvur; mglawik I; gammopaz; lindosep; lintox; lorexane; milbol 49; mszycol; Nexit; neo-scabacidol; nexen-fb; novigam; nicochloran; pedraczak; omnitox; ovadziak; pflanzol; PLK; owadziak; quellada; Sang gamma; silvanol; streunex; TAP 85; TRI-6; verindal ultra; Viton; Borer Spray; Lindalo; Lindamul; Lindaterra; Novigan; etc.

**Formula:** C<sub>6</sub>H<sub>6</sub>Cl<sub>6</sub>

## GENERAL BACKGROUND AND USE

Lindane was one of the most widely utilized insecticide on world-wide scale. Its insecticidal properties were discovered in the early 1940s by ICI Ltd. Lindane excellently acts for controlling a wide range of sucking and chewing insects. It also gives a control of grains in storage, in household and livestock. Lindane is a chlorinated hydrocarbon with stomach, contact and respiratory actions with a relatively long residual activity. (Holoubek et al., 2000). It acts as stimulant to the nervous system causing epileptiform convulsions and death. Lindane is persistent in the environment, bioaccumulates in the food chain and is toxic to humans, aquatic and terrestrial species. In some countries adjacent to the Baltic Sea, e.g. Denmark, Poland, Germany and Norway, lindane is still in use for controlling crop and forest pests and fumigating storage rooms. In Norway there are no restrictions against usage of this product but it is banned in Poland, Denmark and Germany. In Sweden, Estonia, Latvia and Lithuania, a total ban against usage of both technical HCH and lindane exists. Finland has banned usage of lindane, but technical mixture of HCH is unregistered (Holoubek et al., 2000).

<http://www.fao.org/ag/AGP/AGPP/Pesticid/PIC/dgdhome.htm>

Tab. 5:  $\gamma$ -HCH emissions of HELCOM countries according to POPCYCLING-Baltic project [t/y]

Country	1970	1975	1980	1985	1990	1995	1996
Denmark	3.0	3.3	4.3	2.9	2.9	0	0
Estonia	0.17	0.17	0.16	0.16	0.007	0.005	0.003
Finland	0.82	1.16	4.97	1.84	0	0	0
Germany	25.9	52.6	111.4	49.6	27.7	0	0
Latvia	0.62	0.62	0.32	0.10	0.01	0.002	0.003
Lithuania	1.61	1.61	1.25	0.74	0.10	0.003	0.002
Poland	22.8	16.8	7.1	2.8	0.45	0.3	0.3
Russian Fed.	540	540	420	206	13.7	5.9	5.9
Sweden	4.6	2.0	3.1	1.6	2.7	1.4	1.1
<b>total</b>	<b>600</b>	<b>618</b>	<b>553</b>	<b>266</b>	<b>47</b>	<b>8</b>	<b>7</b>

(in: Bartnicki et al., 2000).

The main emission sources are located in southern-western part of Europe, whereas emissions in the Baltic Sea region are almost absent. Hence, the problem of contamination of the Baltic Sea with lindane is clearly of transboundary nature (Bartnicki et al., 2000).

Tab. 6: Emission inventory for Lindane for the German Baltic Sea catchment area [kg/a], 1998.

Emissions industrial plants	Emissions municipal STP*	Emission in German Baltic Sea catchment area	Calculated total emission in German Baltic Sea coastal <sup>1)</sup> catchment area**	Calculated total emission in German Oder <sup>2)</sup> catchment area**	Calculated total emission in German Baltic Sea catchment area**
-	3.32	3.32	8.32	1.64	10

\*STP = waste water treatment plants \*\*according to method developed by BfG

1) Point sources in Mecklenburg - Western Pomerania and Schleswig Holstein

2) Point sources in Brandenburg and Saxony

The occurrence of lindane in municipal waste water is probably related to current applications and does not derive from past production waste residue. This is pointed to by the absence of other HCH isomers in these samples.

Tab. 7: Lindane usage [t/y] in Europe

Country	1970	1975	1980	1985	1990	1995
Denmark	8.67	9.4	12.42	8.36	8.36	0
Estonia	0.48	0.48	0.47	0.45	0.02	0.01
Finland	2.34	3.31	14.2	5.26	0	0
Germany	0	0	0	0	79.03	0
Germany East	23.52	25.9	28.42	14.14	0	0
Germany West	50.39	124.4	290	127.6	0	0
Latvia	1.76	1.76	0.91	0.3	0.04	0.01
Lithuania	4.6	4.6	3.58	2.13	0.28	0.01
Poland	65.11	48.05	20.27	7.92	1.27	0.81
Russia	1720.66	1720.66	1338.29	657.2	43.5	18.93
Sweden	13.11	5.7	8.9	4.5	0	0

(in: Münch & Axenfeld, 1999)

Tab. 8: Lindane emission [t/y] in Europe

Country	1970	1975	1980	1985	1990	1995
Denmark	3.04	3.30	4.36	2.93	2.93	0.00
Estonia	0.17	0.17	0.16	0.16	0.01	0.01
Finland	0.82	1.16	4.98	1.84	0.00	0.00
Germany	0.00	0.00	0.00	0.00	27.72	0.00
Germany East	7.72	8.50	9.33	4.64	0.00	0.00
Germany West	17.67	43.63	101.70	44.75	0.00	0.00
Latvia	0.62	0.62	0.32	0.10	0.01	0.00
Lithuania	1.61	1.61	1.25	0.75	0.10	0.00
Poland	22.84	16.85	7.11	2.78	0.45	0.28
Russia	603.43	603.43	469.34	230.48	15.26	6.64
Sweden	4.60	2.00	3.12	1.58	0.00	0.00

(in: Münch & Axenfeld, 1999)

## REGULATORY STATUS

Lindane is not included as active substance in Annex I to Directive 91/414/EEC (Official Journal of the European Communities, L 324 Volume 43, 21 Dec 2000). That means that Member States shall ensure that authorisations for plant protection products containing Lindane are withdrawn within a period of six months from the date of adoption of this decision and no authorisations will be granted or renewed.

Denmark	sale banned in 1994 use banned from 1 July 1995 not used in forestry and timber processing industry regulation No. 5 (see Annex)
Estonia	banned 1967 not used in forestry and timber processing industry
Finland	marketing and use was banned in 1972, 1984, 1987, 1996 (before: use as insecticide), no allowed uses since 1988 no import, no production, (probably) no stockpiles left not used in forestry and timber processing industry
Germany	ban of use for pesticides since 1997 restricted in use (see below) not registered since the end of 1997 as a plant protection product (no application have been made for re-registration) is used for wood preservation and as a insecticide under the Federal Epidemics Act further regulations No. 1, 3, 5, 7, 8 (see Annex)
Latvia	no registration/licensing for plant protection use (banned 1986, 2000) no info about use as industrial chemical in use, stockpiling: 16.6 t/a not used in forestry and timber processing industry regulation No. 1 (see Annex)
Lithuania	not registered as pesticide (banned) stockpiles: 570 kg of Lindane, 49758 kg of Fentiuram (20 % gamma-HCH) in farms not used in forestry and timber processing industry regulation No. 1 (see Annex)
Poland	not registered and permitted for marketing and use as a pesticide since 1991 legally banned for marketing/use as plant protection product since 1996 import not possible (except for scientific purposes) possible losses to the environment are not known presumably no production and export not used in forestry and timber processing industry regulations No. 1, 2 (see Annex)
Russia	registered as plant protection product, use until 1987 no info about use as industrial chemical, disinfectant, antifouling or as biocide banned for production, import, marketing and use since 1987 not used, not released to the environment, not stockpiled not used in forestry and timber processing industry less hazardous substances exist, but not used due to lack of knowledge, too expensive and other reasons regulations No. 1, 2 (see Annex)

Sweden      banned 1989  
no longer in use as a.i. in biocides  
not used in forestry and timber processing industry

Tab. 9:      Legal measures against the use of HCH and Lindane in European countries

<b>Country</b>	<b>Action</b>	<b>Year</b>	<b>Restrictions/ Remaining uses</b>
Denmark	gamma-HCH banned	1994	pesticide use prohibited in 1995
E.C.	gamma-HCH severely restricted	1978/ 88	EEC Directive 79/117 on HCH containing less than 99% of the gamma-isomer
Finland	HCH cancelled gamma-HCH banned	1977 1987	mixed isomers cancelled 1977
Germany	gamma-HCH banned	1984/ 88	1984 ban of production
Poland	Phase-out	NA	
Sweden	HCH and gamma-HCH banned	1989	
U.S.S.R	gamma-HCH severely restricted	1988	prohibited for use as pesticide
Russia			tech. HCH probably still in use gamma-HCH still in use

(Breivik et al., 1999, in: Münch et al., 1999).

## MIREX

(CAS-NO. 2385-85-5)

**Synonyms/tradenames:** Hexachloropentadiene dimer; Dechlorane; 1,1a,2,2,3,3a,4,5,5,5a,5b,6-Dodecachloro-octahydro-1,3,4-metheno-1H-cyclobuta[cd]pentalene; perchloropentacyclodecane; cg-1283; 1,2,3,4,5,5-Hexachloro-1,3-cyclopentadiene dimer; dodecachloropentacyclodecane; gc 1283; perchlorodihomocubane; dodecachlorooctahydro-1,3,4-metheno-1H-cyclobuta(cd)pentalene; bichlorendo; hrs 1276; dechlorane 4070; ferriamicide; Dechlorane Plus (etc.)

**Formula:** C<sub>10</sub>Cl<sub>12</sub>

## GENERAL BACKGROUND AND USE

Mirex is a stomach insecticide with little contact activity and has found its widest use against ants. It is also a fire retardant for plastics, rubber, paint, paper and electrical goods. <http://www.speclab.com/compound/c2385855.htm>

Mirex is considered to be one of the most stable and persistent pesticides, with a half-life of up to 10 years. Bioconcentration factors of 2600 and 51400 have been observed in pink shrimp and fathead minnows, respectively (IPCS, 1996).

## REGULATORY STATUS

Denmark	pesticide not approved for use
Estonia	banned 1967
Finland	never been registered or used, no intended uses no import, no production, no stockpiles
Germany	never registered, never been used in Germany regulation No. 7 (see Annex)
Latvia	no registration/licensing for plant protection use no use, no stockpiling regulations No. 1, 4, 5, 6 (see Annex)
Lithuania	not registered as pesticide (banned) no remains/stockpiles regulation No. 1 (see Annex)
Poland	not registered and permitted for marketing and use as a pesticide since 1965 not used, but not directly banned
Russia	not registered as pesticide or wood preservative banned for production, import, marketing and use not used, not released to the environment, not stockpiled
Sweden	never registered or used

## MORFAMQUAT

(CAS-NO. 4636-83-3)

**Synonyms/tradenames:** 1,1'-bis(3,5-dimethylmorpholinocarbonylmethyl)-4,4'-bipyridinium; 1,1'-bis(3,5-dimethylmorpholinocarbonylmethyl)-4,4'-bipyridylium; 1,1'-bis[2-(3,5-dimethyl-4-morpholinyl)-2-oxoethyl]-4,4'-bipyridinium

**Formula:** C<sub>26</sub>H<sub>36</sub>N<sub>4</sub>O<sub>4</sub>

### GENERAL BACKGROUND AND USE

Dithiocarbamate-herbicide (cholinesterase inhibitor), quaternary ammonium herbicides.

### REGULATORY STATUS

Denmark	pesticide never approved for use
Estonia	banned 1999
Finland	never been registered or used, no intended uses no import, no production, no stockpiles
Germany	complete ban of use as a plant protection product import of planting material containing the substance prohibited regulations No. 3, 7 (see Annex)
Latvia	no registration/licensing for plant protection use no use, no stockpiling regulations No. 1, 4, 5, 6 (see Annex)
Lithuania	not registered as pesticide no remains/stockpiles
Poland	not registered and permitted for marketing and use as a pesticide since 1965 legally banned for marketing/use as plant protection product since 1996 import not possible (except for scientific purposes) possible losses to the environment are not known presumably no production and export regulation No. 2 (see Annex)
Russia	no info available concerning the registration as plant protection product, wood preservative or biocide no info available concerning production, import, marketing and use probably no use and no stockpiling
Sweden	never registered or used

## NITROPHEN

(CAS-NO. 1836-75-5)

**Synonyms/tradenames:** 2',4'-dichloro-4-nitrodiphenyl ether; 4(2,4-dichlorophenoxy)nitrobenzene; FW 925; Nitrochlor; mezotox; niclofen; NIP; nitrafen; nitrofen; preparation 125; TOK; tokkorn; trizilin; 2,4-Dichloro-1-(4-nitrophenoxy)benzene; etc.

**Formula:** C<sub>12</sub>H<sub>7</sub>Cl<sub>2</sub>NO<sub>3</sub>

### GENERAL BACKGROUND AND USE

Nitrophen is a contact herbicide for pre- and post-emergence control of annual grasses and broadleaf weeds (<http://www.speclab.com/compound/c1836755.htm>).

### REGULATORY STATUS

Denmark	pesticide not approved for use last sale in 1978
Estonia	banned 1999
Finland	marketing and use was banned in 1996, registration voluntarily withdrawn in 1980 no import since 1980, no production, (probably) no stockpiles left
Germany	completely banned for use as a plant protection product registered in FRG until 1980; in Ex-GDR until 1990 import of planting material containing the substance prohibited regulations No. 3, 7 (see Annex)
Latvia	no registration/licensing for plant protection use (banned 2000) regulations No. 1, 2 (see Annex)
Lithuania	no registration as pesticide import, production and use as pesticide is banned marketing restricted stockpiling: 62166 kg in farms' storages regulations No. 1, 3, 4 (see Annex)
Poland	not registered and permitted for marketing and use as a pesticide since 1984 legally banned for marketing/use as plant protection product since 1996 import not possible (except for scientific purposes) possible losses to the environment are not known presumably no production and export regulation No. 2 (see Annex)
Russia	registered as plant protection product, use until 1997 no info about use as industrial chemical, wood preservative, disinfectant, antifouling or as biocide banned for production, import, marketing and use since 1997 not used, not released to the environment, not stockpiled less hazardous substances exist, but not used due to lack of knowledge, expensiveness and other reasons



regulations No. 1, 5, 6, 7, 8,9, 10, 11 (see Annex)

Sweden

banned 1979

## PENTACHLOROPHENOL

(CAS-NO. 87-86-5)

**Synonyms/tradenames:** Pentachlorophenate; 2,3,4,5,6-Pentachlorophenol; Penta; Dowicide 7; penchlorol; Santophen 20; Chlorophen; Pentacon; Penwar; Sinituho; PCP; dp-2; dow pentachlorophenol dp-2 antimicrobial; chem-tol; cryptogil oil; durotox; EP 30; fungifen; glazd grundier arbezol; lauxtol; liroprem; term-i-trol; thompson's wood fix; penta-kil; peratox; permacide; permagard; permasan; permatox penta; permite; priltox; santobrite; Pol-NU; Oz-88; Osmoplastic; Forepen; Dura-Treet (etc.)

**Formula:** C<sub>6</sub>HCl<sub>5</sub>O

### GENERAL BACKGROUND AND USE

PCP is used as a wood preservative with algaecide, fungicide, and insecticide effects. In non-wood uses PCP acts as a general disinfectant, herbicide, insecticide (termiticide), molluscicide, defoliant, germicide, anti-fouling paint and inhibits the fermentation in various materials. Industrial uses comprise uses in textiles, inks, paints, disinfectants and cleaners. PCP affects uncoupling mitochondrial oxidative phosphorylation, thereby causing accelerated aerobic metabolism and increasing heat production. It causes loss of membrane electrical resistance. It is highly toxic to aquatic organisms and contains several highly toxic dioxins, which have shown carcinogenic effects in experimental animals.

<http://www.speclab.com/compound/c87865.htm>

<http://www.fao.org/ag/AGP/AGPP/Pesticid/PIC/dgdhome.htm>

According to Finland's Draft OSPAR Background Document on Pentachlorophenol (2001) the identified main sources of PCP, NaPCP (PCP's salt Sodium Pentachlorophenate) and PCPL (PCP's ester Pentachlorophenyl laurate) into the environment are:

- production of PCPL from PCP
- treatment of wood (sapstain control agent)
- impregnation of heavy-duty textiles and fibres (fungicide)
- use and disposal of PCP, NaPCP and PCPL treated wood and textiles
- contaminated sites and treatment of contaminated soil and groundwater
- natural sources or burning processes

Recent data from the US Pentachlorophenol Task Force (2000) indicate that PCP is no longer used as a wood preservative in Europe. Production of PCP and NaPCP ceased in the EU in 1992.

Tab. 10: Emission inventory for Pentachlorophenol for the German Baltic Sea catchment area [kg/a], 1998.

Emissions industrial plants	Emissions municipal STP	Emission in German Baltic Sea catchment area	Calculated total emission in German Baltic Sea coastal <sup>1)</sup> catchment area**	Calculated total emission in German Oder <sup>2)</sup> catchment area**	Calculated total emission in German Baltic Sea catchment area**
4.75	2.66	7.42	6.74	6.95	<b>13.7</b>

\*STP = waste water treatment plants; \*\*according to method developed by BfG

1) Point sources in Mecklenburg - Western Pomerania and Schleswig Holstein

2) Point sources in Brandenburg and Saxony

Despite the ban of production and use, PCP was found in the discharges of all the municipal wastewater treatment plants, with loads in the area of 1 kg/a. These residues may be the consequence of a direct emission from PCP treated wood or textiles, or have arisen photolytically from former compounds. On the other hand, the constantly highest findings in the case of the monitored industrial plants were for the two

paper factories in Brandenburg. Chlorine bleach is no longer used in paper industry production according to the managers, and may be thus ruled out as a source of PCP emissions. Investigating the wastepaper used as the raw material (recycling) may provide further indications of the PCP source.

## REGULATORY STATUS

The uses of PCP, NaPCP and PCPL in the European Union have been limited since the Member States adopted **Council Directive 91/173/EEC** (21 March 1991). In May 1999 restrictions on use of PCP and its salts and esters were tightened by the **Commission Directive 1999/51/EC**, according to it, PCP and its salts and esters shall not be used in concentrations equal to or greater than 0.1 % by mass in substances or preparations placed on the market. Member States shall apply appropriate provisions as from 1<sup>st</sup> September 2000. Furthermore, the use of PCP, NaPCP and PCPL will cease by the end of 2008 in all EU Member States.

Denmark	pesticide approval expired in 1981 last sale in 1978 not used in forestry and timber processing industry
Estonia	banned 1999 not used in forestry and timber processing industry
Finland	use of PCP as antisapstain agent for treatment of wood ceased in 1984 by voluntary agreement PCP as such has not been produced in Finland restricted marketing and uses since 1993 (only three purposes) ban of use and placing on market of PCP and its salt and ester since 1 <sup>st</sup> March 2000 regulations No. 3, 4 (see Annex) not used in forestry and timber processing industry
Germany	complete ban of production and use in 1989 import of planting material containing the substance prohibited production and marketing as pesticide is prohibited completely banned for use in forestry and timber protection regulations No. 1, 3, 5, 7, 8, 10, 11, 12 (see Annex)
Latvia	no registration/licensing for plant protection use no info about use as industrial chemical banned for marketing and use: 01.01.2001 (except products, with conc. < 0.1 %) no use, no stockpiling not used in forestry and timber processing industry regulation No. 2 (see Annex)
Lithuania	no registration as pesticide import, production and use as pesticide is banned marketing restricted probably used in forestry and timber processing industry as wood preservative stockpiling: 553 kg in farms' storages regulations No. 1, 3, 4 (see Annex)
Poland	not registered and permitted for marketing and use as a pesticide since 1967 legally banned for marketing/use as plant protection product since 1996 import not possible (except for scientific purposes) possible losses to the environment are not known presumably no production and export

not used in forestry and timber processing industry  
regulation No. 2 (see Annex)

Russia      banned in USSR  
not used in forestry and timber processing industry

Sweden     banned 1978 (not registered)  
no longer in use as a.i. in biocides  
no remaining uses are allowed  
not used in forestry and timber processing industry

## RECOMMENDED MEASURES

(according to Draft OSPAR Background Document on Pentachlorophenol, Finland 2001)

- permits and stringent emission limit values for plants producing or using the substance(s)
- ban on import of treated products and materials
- information campaign
- promoting clean-up activities of PCP contaminated sites

## QUINTOZENE

(CAS-NO. 82-68-8)

**Synonyms/tradenames:** Pentachloronitrobenzene, Avical; Fortox; Kobu; Marison Forte; Pkhnb; Terrafun; Tri PCNB; PCNB; Quintozine; quintobenzene; Terrachlor; Avicol; Botrilex; Earthcide; Kobutol; Pentagen; Tilcarex; nitropentachlorobenzene; brassicol; batrilex; fomac 2; fungiclor; gc 3944-3-4; KP 2; olupisan; saniclor 30; tritisan (etc.)

**Formula:** C<sub>6</sub>Cl<sub>5</sub>NO<sub>2</sub>

### GENERAL BACKGROUND AND USE

Quintozene is/was used as a herbicide, a soil fungicide on lawns and ornamental crops, as a seed treatment of field crops and vegetables (e.g., barley, corn, cotton, oats, rice, and wheat), and as a slime inhibitor in industrial waters.

<http://www.speclab.com/compound/c82688.htm>

### REGULATORY STATUS

Quintozene is not included as active substance in Annex I to Directive 91/414/EEC (Official Journal of the European Communities, L 332 Volume 112, 27 Dec 2000). That means that Member States shall ensure that authorisations for plant protection products containing quintozene are withdrawn within a period of six months from the date of adoption of this decision and no authorisations will be granted or renewed.

Denmark	pesticide approval expired in 1985 last sale in 1984
Estonia	banned 1999
Finland	marketing and use was banned in 1996, registration voluntarily withdrawn in 1991 (before: used as fungicide) no import, no production, (probably) no stockpiles left
Germany	completely banned as a plant protection product registered in FRG until 1987; in Ex-GDR until 1986 import of planting material containing the substance prohibited regulations No. 3, 7 (see Annex)
Latvia	no registration/licensing for plant protection use no info about use as industrial chemical banned for import, marketing and use as plant protection product: 25.03.2000 (except other products with < 1 g HCB/kg or < 10 g Pentachlorobenzene/kg) not banned for production no use, no stockpiling regulation No. 1 (see Annex)
Lithuania	no registration as pesticide restricted to professional users stockpiling: 479 kg of Quintozene and 40177 kg of Pentatiuram (20 % Quintozene) in farms' storages regulation No. 1 (see Annex)

Poland	<p>not registered and permitted for marketing and use as a pesticide since 1988</p> <p>legally banned for marketing/use as plant protection product since 1996</p> <p>import not possible (except for scientific purposes)</p> <p>possible losses to the environment are not known</p> <p>presumably no production and export</p> <p>regulation No. 2 (see Annex)</p>
Russia	<p>no info available concerning the registration as plant protection product, wood preservative or biocide</p> <p>no info available concerning production, import, marketing and use</p> <p>probably no use and no stockpiling</p>
Sweden	banned 1985

## TOXAPHENE

(CAS-NO. 8001-35-2)

**Synonyms/tradenames:** melipax; toxakil; phenacide; Campheclor; (Poly)chlorinated camphene; Hercules 3956; Alltox; Strobane-T; Geniphene; Motox; Penphene; Phenatox; Chlorocamphene; camphochlor; octachlorocamphene; agricide maggot killer (f); alltex; attac; camphofene huileux;; clor chem t-590; compound 3956; crestoxo; cristoxo; estonox; fasco-terpene; gy-phene; M 5055; strobane t-90; toxadust; toxon 63; toxyphen; vertac Agricide; Coopertox (etc.)

**Formula:** C<sub>10</sub>H<sub>10</sub>Cl<sub>8</sub>

### GENERAL BACKGROUND AND USE

Toxaphene, a polychloroterpene, is a mixture of more than 175 components produced by chlorination of camphene. Since its development in 1947 it has been used extensively as a pesticide (non-systemic contact and stomach insecticide, miticide). It acts on the neurons, causing an imbalance in sodium and potassium ions, similar to that of the cyclodiene insecticides. It has little initial but a persistent effect against insects. It was also used for control of animal ectoparasites. Toxaphene is very persistent. Hydrolysis, photolysis and biodegradation are not significant. When released to soil it will persist for long periods (one to 14 years), is not expected to leach to groundwater or be removed significantly by runoff. Toxaphene is a highly bioaccumulating compound. Bioconcentration factors of 4247 and 76000 have been recorded in mosquito fish and brook trout, respectively (IPCS, 1996). Toxaphene in the atmosphere has been shown to be transported over long distances. Toxaphene was used on cotton, first in combination with DDT, for alone it had minimal insecticidal qualities. Then, in 1965, after several major cotton insects became resistant to DDT, toxaphene was formulated with methyl parathion. Toxaphene's registrations were cancelled by US EPA in 1983.

<http://ipmworld.umn.edu/chapters/ware.htm> ; <http://www.speclab.com/compound/c8001352.htm>  
<http://www.fao.org/ag/AGP/AGPP/Pesticid/PIC/dgdhome.htm>

Melipax (Toxaphene) was used extensively in Poland in the place of DDT (Holoubek et al., 2000).

According to Directive 67/548/EEC on the approximation of the laws, regulations and administrative provisions relating to the classification, packaging and labelling of dangerous substances, Toxaphene is classified as toxic, carcinogen Cat. 3 (T: R25, R40, Carc. Cat. 3); Xn: R21-R37/38; N: R50-53), that means it is possibly carcinogenic to humans and it is extremely toxic to fish.

### REGULATORY STATUS

In the European Union it is prohibited to use or place on the market all plant protection products containing toxaphene (camphechlor) as an active ingredient since 1984. No remaining uses are allowed.

Denmark	pesticide not approved for use
Estonia	banned 1967
Finland	marketing and use as pesticide was banned in 1969 no import, no production, no stockpiles
Germany	completely banned for use as a plant protection product in 1981 registered in FRG until 1979; in Ex-GDR until 1990 (for special cases)

regulations No. 5, 7 (see Annex)

Latvia	no registration/licensing for plant protection use (banned 2000) no use, no stockpiling but collection of 3.819 t hazardous waste regulation No. 1 (see Annex)
Lithuania	no registration as pesticide (banned) no remains/stockpiles regulation No. 1 (see Annex)
Poland	not used, not directly banned, not listed on registers of pesticides permitted for marketing and use probably no import regulations No. 1, 2 (see Annex)
Russia	no info available concerning the registration as plant protection product, wood preservative or biocide no info available concerning production, import, marketing and use probably no use and no stockpiling
Sweden	never registered or used



### 3. CONCLUSION

*no use* From the data submitted by the Contracting Parties and information extracted from additional sources (see references) it can be concluded that the selected pesticides for immediate priority action (HELCOM Recommendation 19/5, Attachment, Appendix 3) are no longer in use or have never been in use, are not registered for the use as a pesticide, or have been banned – either completely for all uses or at least for the use as a pesticide. This applies for all Contracting Parties. However, there might be a few uncertainties with regard to the Russian Federation.

Estonia, Latvia, Lithuania, Russia and Poland have undergone deep socio-economic changes since 1989. The use of plant protection products and fertilisers as such has significantly decreased since then (BEF, 2000). In Poland, for example, the total pesticides consumption (a.i.) decreased from 12398 tons in 1985 to 7548 tons in 1990. The specific amount of pesticides used per hectare has decreased from 0.8 to 0.5 kg/ha, respectively, during the same time.

Within the Contracting Parties that are also EU Member States most of the selected pesticides have been banned since long or have even never been used.

*clearly regulated* Table III in Annex II gives an overview on the legal situation concerning the selected substances used as pesticides in the Contracting Parties. The given information is only related to the potential use as a pesticide. Explanations concerning possible other uses, exemptions and detailed information can be found in chapter 2.

*obsolete pesticides* Although most of the selected pesticides are not used anymore in nearly all Contracting Parties, they are stored in some countries as obsolete pesticides. In numerous cases the storage conditions are bad with seriously deteriorated stocks being a source of severe pollution, a threat to human health (scattered uncontrolled rural stockpiling, both long term exposure of local population and risk of fires etc.) and the environment (especially groundwater, drinking water). In many countries unquantified amounts of soil and building materials have been heavily contaminated by pesticides leaking from inadequate storage facilities.

To combat the problem of obsolete pesticides a further accumulation of obsolete pesticide stocks has to be prevented. Inventories of obsolete pesticide stocks have to be carried out, followed by a safe and environmentally sound disposal of bulk quantities of obsolete pesticides. The local responsible people have to be trained on pesticide stock management so that the risk for the environment can be reduced. Further, FAO called upon its members to apply Integrated Pest Management (IPM) and to reduce the use of pesticides, where this is possible.

*progress* This report shows also progress in the implementation of HELCOM Recommendation 19/5. Concerning the pesticides selected for immediate priority action of its Appendix 3 the cessation goal can be taken as largely reached. This conclusion is based on the assumption that further steps will be undertaken to combat the problem of obsolete pesticides. Thus, the working list of hazardous substances can be updated.

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## 5. LINKS

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<http://www.speclab.com/compound/c8001352.htm>  
<http://www.fao.org>  
<http://www.fao.org/ag/AGP/AGPP/Pesticid/PIC/dgdhome.htm>

## 6. ANNEXES

### Annex I: Legal acts within the Contracting Parties

#### Denmark

1. **Statutory order No. 921 of 8 October 1996** regarding quality criteria for aquatic compartments for certain hazardous substances in relation to emission from point sources.
2. **Statutory order No. 689 of 24 August 1999**
3. **Statutory order No. 21 of 16 January 1996**
4. **Statutory order No. 459 of 5 September 1984**
5. **Act no. 438 of 1 June 1994**

#### Estonia

According to the **Order from 21.10.1967** approved by the Government the import of chlororganic plant protection products were banned in Estonia.

##### 1. **Chemicals Act** (adopted May 6, 1998; amended April 28, 1999)

###### Secondary Legislation:

- ❑ **Government Regulation No. 6;** January 5, 1999 on establishing of procedure for importing and exporting prohibited and strictly restricted chemicals.
- ❑ **Government Regulation No. 96;** March 16, 1999: The Order of retail sale of dangerous chemicals.
- ❑ **Government Regulation** establishing the Chemicals Notification Center.
- ❑ **Regulation of the Minister of Economic Affairs No. 64;** December 29, 1999: Requirements to equipment handling of dangerous chemicals.
- ❑ **Regulation of the Minister of Social Affairs No. 63;** December 11, 1998: The procedure for recording of dangerous chemicals in dangerous enterprises.
- ❑ **Regulation of the Minister of Social Affairs No. 64;** December 11, 1998: The procedure for identification, classification, packaging and labelling of preparations.
- ❑ **Regulation of the Minister of Social Affairs No. 18;** March 22, 1999: The procedure for notification of chemicals (92/32/EEC; 793/93/EEC; 88/320/EEC; 87/18/EEC; 89/569/EEC; EEC/1488/94; 2161/1999).
- ❑ **Regulation of the Minister of Social Affairs;** June 16, 1999: European Inventory of Existing Commercial Chemical Substances (EINECS).
- ❑ **Regulation of the Minister of Social Affairs No. 52;** July 12, 1999: The Chemicals Notification Centre statute and budget.
- ❑ **Regulation of the Minister of Social Affairs;** December 3, 1999: Restrictions on the handling of chemicals (detergents) that are dangerous to the population and the environment (73/404/EEC; 82/242/EEC; 82/243/EEC).

##### 2. **Waste Act** (June 10, 1998 and some changes February 17, 1999)

##### 3. **Plant Protection Act** (March 31, 2000)

##### 4. **Food Act** (February 25, 1999)

##### 5. **Chemical Safety Commission** (August 4, 1998 and some changes October 13, 2000)

##### 6. **Government Regulation No. 99;** March 16, 1999 on ratifying the list of products dangerous to environment as waste, the production, import, export and use of which is prohibited.

**7. Government Regulation No. 14;** January 12, 2000 concerning the list of permitted pollutants in food and usage of limits by food groups.

**8. Regulation of the Minister of Environment No. 58;** June 16, 1999 on establishing of amount limits of hazardous substances in soil and groundwater.

**9. Regulation of the Minister of Environment No. 71;** July 19, 1999 on establishing of procedure of managing waste containing polychlorinated biphenyls and polychlorinated terphenyles (Dir 96/59/EEC).

**10. Regulation on the State Register of Plant Protection Products;** adopted 12.03.1999.

**11. Regulation on classification, packaging and labelling of Plant Protection Products;** adopted 23.02.1999.

**12. Regulation on fixing the list of active substances prohibited to use in Plant Protection Products;** adopted 26.01.1999 (Dir 79/117/EEC).

## Finland

**1. Poison Act (from year 1969).**

**2. Chemicals Act**

**3. Council of State Decision (VNp 846/1993) from 1993** restricts marketing and use of Pentachlorophenol. Implements EC Directive 91/173/EEC. Use is allowed only for three purposes:

1. in the impregnation of fibres and heavy-duty textiles not intended in any case for clothing or for decorative furnishing,
2. as a synthesizing and/or processing agent in industrial processes,
3. in the industrial or professional treatment of wood, if the chemical has been accepted as wood preservative according to the Chemicals Act

**4. The Council State of Decision from 2000 has replaced the Council of State Decision from 1993.**

EC Directive 1999/51/EC was enforced by Council of State Decision (VNp 143/2000) in February 2000. Council of State Decision from 2000 bans the use and placing on the market of PCP and its salt and ester (this applies also to preparations, where 0.1 weight percent of a substance can not be exceeded). The ban has entered into force on 1st March 2000.

## Germany

**1. Ordinance on Incidences (Störfall-Verordnung):**

The regulation applies to specified plants in which the substance is present or could be produced during an incident. The operator has to take the necessary security measures to prevent incidents in which the substance causes a serious hazard to humans or the environment due to higher emissions, fires, or explosions. An inventory of stored substances has to be kept. The competent authority has to be informed immediately when an incidence happened. When certain threshold amounts of the substance are exceeded a safety analysis of the plant is required and the operator has to inform the neighbourhood and the general public about the plant and the adequate behaviour in the case of an incident.

Original: Bundesgesetzblatt, I, 1891, 1991

Amendment: Bundesgesetzblatt, I, 726, 1998

**2. Ordinance on Chlorine and Bromine Compounds as Additives in Petrol (Verordnung über Chlor- und Bromverbindungen als Kraftstoffzusatz - 19. BlmschV):**

Petrol may only be marketed if it contains no chlorine compounds or bromine compounds as additives for Petrol. Original: Bundesgesetzblatt, I, 75, 1992

**3. Ordinance on the Use for Plant Protection (Pflanzenschutz - Anwendungsverordnung):**

Plant protectants consisting of or containing the substance may not be used. The import of planting material

containing the substance is prohibited.

Original: Bundesgesetzblatt, I , 1887 , 1992

Amendment: Bundesgesetzblatt, I, 60 , 1997

(German Registration system started 1968)

Lindan is restricted in use: The application in mills, flour silos, in stocks of grain and grain products is prohibited. Plant protectants consisting of or containing the substance may not be used in protected water areas and mineral spring areas against bark-beetles in removed bark, and as pouring agent and spreading agent. The substance may not be used in natural preserves, national parks, natural monuments and other protected areas unless the use is explicitly permitted.

#### **4. Technical Instructions on Air quality Control (Technische Anleitung zur Reinhaltung der Luft):**

This substance belongs to class III carcinogens. In air emission the concentration of the sum of class II carcinogens must not exceed 5 mg/m<sup>3</sup> at a mass flow of  $\geq 25$  g/h

Original: Gemeinsames Ministerialblatt, 7 , 93 , 1986

#### **5. Maximum concentrations at the Workplace and Biological Tolerance Values for Working Materials (Maximale Arbeitsplatzkonzentrationen und biologische Arbeitsstofftoleranzwerte):**

Danger of cutaneous absorptions. Carcinogenic working material proven in animal experimentation. No MAK value established, though.

Original: Mitteilung der Senatskommission zur Prüfung gesundheitschädlicher Arbeitstoffe, 33 1997.

#### **6. Technical Guidance Note for Hazardous Chemicals (TRGS) 102:**

Technical Exposure limits (TRK) for Hazardous Chemicals

Original: Bundesarbeitsblatt, 9 , 65 , 1993

#### **7. Ordinance on Maximum Limits of Residues (Rueckstands - Höchstmengenvorordnung):**

Tea: 0,1 mg/kg. Other plant products: 0.01 mg/kg

Original: Bundesgesetzblatt, I , 2299, 1994

Amendment: Bundesgesetzblatt, I, 164 , 1999

#### **8. Administrative rules concerning substances Hazardous to Water (Verwaltungsvorschrift wassergefährdender Stoffe):**

This substances is classified as severely hazardous to water (Water Hazard class 3). The classification forms the basis for water protection requirements for industrial plants in which hazardous substances are handled.

Original: Gemeinsames Ministerialblatt, 16, 327, 1996

#### **9. „DDT Law“ Ordinance on the Prohibition of Chemicals (Chemikalien-Verbotsverordnung) of 7.8.1972, amended 15.9.1986 (Bundesgesetzblatt, I, p. 1505):**

DDT and formulations prepared with DDT may not be marketed. Exceptions for scientific purposes have to be approved by the competent authorities. - Applies to DDT and its isomers.

#### **10. Ordinance on the prohibition on chemicals (Chemikalien-Verbotsverordnung):**

It is prohibited to market 1) Pentachlorophenol; 2) Pentachlorophenol sodium salt and other Pentachlorophenol salts and compounds; 3) formulations containing Pentachlorophenol, its salts or compounds at a mass content of  $\geq 0.1$  %; 4) products containing more than 5 mg/kg of Pentachlorophenol, its salts or compounds due to a treatment with a formulation containing Pentachlorophenol, its salts and compounds.

Original: Bundesgesetzblatt, I, 1151 , 1996

Amendment: Bundesgesetzblatt, I , 3956, 1998

#### **11. Ordinance on consumer products (Bedarfsgegenständeverordnung):**

Natural wood, natural wood branches, heather and conifer-cones intended for the development of fresh smoke for fumigation of food may not be marketed if the content of pentachlorophenol or its salts exceeds 0.05 mg/kg wood, calculated as pentachlorophenol.

Original: Bundesgesetzblatt, I, 5 , 1998

Amendment: Bundesgesetzblatt, I , 3492, 1998

#### **12. Ordinance on Hazardous Substances (Gefahrstoffverordnung):**

Antifouling dyes containing Hexachlorocyclohexane or its formulations may not be used.

Original: Bundesgesetzblatt, I , 1782 , 1993  
Amendment: Bundesgesetzblatt, I, 50 , 1999

## Latvia

- 1. Regulations of Cabinet of Ministers No. 107 (adopted 21.03.2000):** "On Prohibited Plant Protection Products" (implements Directive 79/117/EEC).
- 2. Regulations of Cabinet of Ministers No. 158 (25.04.2000.):** "Restrictions and bans on use and marketing of some dangerous chemical substances and dangerous chemical products". Implements Directive 76/769/EEC; will enter into force 01.01.2001.
- 3. Law on Chemical Substances and Chemical Products (01.04.1998)**
- 4. Plant Protection Law (adopted 17.12.1998)**
- 5. Regulation on Placing on the Market, Storage and Use of Plant Protection Products (adopted 07.09.1999)**
- 6. Regulation on Authorisation of Plant Protection Products (adopted 05.10.1999)**

## Lithuania

- 1. Hygienic standards 63: 2000.** Banned and restricted pesticides, import, produce and use as pesticide is banned in Republic of Lithuania.
- 2. Order of Environmental Ministry No. 292 of 31.12.1998.** On Regulations of Issuing Permits for Import and Export from and into Republic of Lithuania Dangerous Chemical substances, for import and export.
- 3. Hygienic standards 36: 1999.** Banned and restricted substances, may not be used in substances and preparations placed on the market for sale to the general public in which concentration is greater than - in fluid and solid substances and preparations - 0.1% by mass, in gaseous substances and preparations - 0.1% by volume. A ban shall not apply to manufactured products, they are controlled by other statements.  
Exception for Pentachlorophenol: This provision shall not apply to substances and preparations intended in the treatment of wood, if technological processes ensure that emissions of PCB contains admixture of hexachlordibezparadioxine concentration less than 4 parts per million (ppm). Treated wood may not be used inside buildings whether for decorative purposes or not whatever their purpose (residence, employment, leisure). For manufacture of containers intended for growing purposes and any retreatment and the manufacture of packaging which may come into contact with or other materials which may contaminate raw, intermediate and/ or finished products intended for human and/or animal consumption and any retreatment. This provision shall not apply to in the impregnation of fibres and heavy duty textiles not intended in any case for clothing or for decorative furnishings, as a synthesizing and/or processing agent in industrial processes, if technological processes ensure that emitted PCP quantities and concentrations don't exceed the set norms in Lithuania and PCP contains admixtures of hexachlordibenzparadioxine concentration below four parts per million (ppm).
- 4. Governmental Resolution No. 452 of 21.07.1999.** On licensing of dangerous chemicals produce, trade and storage.
- 5. The Prior Informed Consent (PIC) procedures and regulations will be implemented in 2003.**
- 6. Plant Protection Law (Law on Amendment of Plant Protection Law, 04.06.1998 No VIII-769)**
- 7. Law on Chemical Substances and Preparations. 18.04.2000 No VIII-1641**
- 8. Order of Minister of Agriculture, Minister of Health Care and Minister of Environment on Regulations of Registration of Plant Protection Products (No 196/134/225 of 07.05.1999)**

**9. Order of Minister of Environment** on Issuing Permits for Import of Plant Protection Products into the Republic of Lithuania (No 12.of 18.01.1999)

## **Poland**

### **1. Act of 21 May 1963 on toxic substances**

Executive Order of the Minister of Health and Social Welfare of 28 Dec. 1964 on the list of poisons and harmful substances;

Executive Order of the Minister of Health and Social Welfare of 10 Feb. 1964 on permissions for production and trade of poisons, poisons' records and rules of procedure of supervising bodies on poisons,

### **2. Act of 16 Oct. 1991 on cultivated plant protection**

Executive Order of the Minister of Agriculture and Food Economy of 12 July 1995 on specific conditions for granting permits for trade and use of plant protection products. Substances referred to this regulation are legally banned and may never be registered and used (until the law is changed).

## **Russia**

### **1. Resolution of the Council Minister from 10.02.1969 1 113**

"About improving organisation for agricultural plants protection from sickliness and saboteurs".

**2. Addition 1 3** to the List chemical and biological means for the pest control with sickliness and saboteurs plants permitted for application in agriculture 1986-1990.

**3. List chemical** and biological means for the pest control with sickliness and saboteurs plants, permitted for application in agriculture, 1972.

**4. List chemical** and biological means for the pest control with sickliness and saboteurs plants permitted for application in agriculture industry, 1982-1985.

### **5. Federation Law from 14.07.1997. 1 99-FL**

"About introduction of changes and additions into the Code of the Russian Federation concerning administrative infringement of the Law" (UL 1997 1 29, item 3500).

### **6. Federation Law from 19.07.1997. 1 109-FL**

"About safety handling with pesticides and agricultural chemistry substances"(UL 1997, 1 99, item 3510).

**7. State Catalogue of pesticides**, permitted for application on the territory of the Russian Federation 1997. State Chemistry Commission of the Russian Federation. Moscow 1997.

**8.** "Instructions of the technical safety measures by stockpiling, transporting and using of the pesticides". Moscow, 1985.

**9.** "Temporal instructions on preparation for storage of prohibited and ineligible for use in agriculture pesticides and its package". Ryazan, 1989.

**10.** "Instructions on preventing measures on bees poisoning by pesticides". Moscow, 1989.

**11.** "The sanitary regulations on stockpiling, transportation and use of pesticides in agriculture". Moscow, 1991.

### **12. Federative Law from 16.07.1998 1 101-ÔÇ**

"About the state regulation of provision of agricultural lands fertility" (ÑÇ 1998. 1 29 item 3399).

### **13. Resolution of the Government of the Russian Federation from 11.09.1998. 1 1090**

"About Statute of the Ministry of agriculture and food provision of the Russian Federation" (ÑÇ 1998, 1 38, item 4808).



**14. Regulations** on management of agricultural plants protection in the Russian Federation, approved by the order of the Ministry of agriculture and food provision of the Russian Federation from 15.06.1999. 1 462.

**15. Regulations** on stockpiling, transportation and use of pesticides and agricultural chemical substances. Moscow, 1999.

**16. State Catalogue** of pesticides and agricultural chemistry substances permitted for the application on the territory of the Russian Federation 2000. Russian Federation. Moscow. 2000.

**17. List chemical** and biological means for the pest control with sickliness and saboteurs plants permitted for application in agriculture. Moscow, 1980.

## **Sweden**

### **1. Observation List.**

Published and revised by the Chemicals Inspectorate every two years. The Observation List provides criteria to professional users for selection of hazardous substances for substitution, and also gives examples of substances fulfilling any criterion.

### **2. Chemical Products and Biotechnical Organisms Ordinance 1998: 941.**

A permit is required for professional imports from countries not being members of the European as well as for professional transfer, as the substance is classified as carcinogenic.

### **3. KIFS 1998: 8, implementing the 16<sup>th</sup> amendment of EU Directive 76/769/EEC.**

Substances classified as carcinogenic, e.g. may not be used in chemical products which are placed on the market to be sold to the general public.

### **4. The Environmental Code; 1<sup>st</sup> Jan. 1999**

## Annex II: Tables

**Tab. I: HELCOM Recommendations relevant for the HELCOM Hazardous Substances work with regard to pesticides**

HELCOM RECOMMENDATION	Recommendation regarding...	Recommends the Governments of the Contracting Parties to the Helsinki Convention that...
<p>RECOMMENDATION 3/2 adopted 17 February 1982, having regard to Article 13, Paragraph b) of the Helsinki Convention</p>	<p>... the Elimination of Discharges of DDT</p>	<p>a) the use and production of DDT and its derivatives should be abandoned whether in pure state or in compositions            b) DDT and its derivatives should not be marketed in the Baltic Sea States            c) transportation and storage of DDT and its derivatives should be effected with due caution to prevent their accidental introduction into the environment of the Baltic Sea Area            d) monitoring of the DDT contents in bottom sediments and marine organisms should be considered under the Baltic Monitoring Programme            recommends further that the restrictions mentioned under a) - d) above should not be imposed on a limited production and the usage of DDT and its derivatives for special purposes such as research and medical application, indoor treatment of young conifers for control of weevil, and treatment of insects in furniture and woodwork, provided that due caution is taken to prevent their introduction into the environment.</p>
<p>RECOMMENDATION 16/11 adopted 15 March 1995 having regard to Article 13, Paragraph b) of the Helsinki Convention</p>	<p>Measures to reduce pollution by pesticides from agriculture, forestry and horticulture</p>	<p>... the use of pesticides in agriculture, forestry and horticulture should be managed under the following conditions in conformity with the code of conduct on the distribution and use of pesticides adopted by the FAO in 1985:            a) Application technology and practice should be designed to prevent unintentional application or run-off of pesticides to bodies of water. Establishment of protection zones beside bodies of water should be encouraged and application by aircraft should be strictly controlled;            b) Handling and storage of pesticides should be carried out so that there is no spillage or leakage to bodies of water or to the ground water. Washing of spraying equipment and disposal of pesticide containers should be strictly controlled;            c) Knowledge about the environmental problems caused by pesticides should be improved by collecting and exchanging information on the presence and effects of pesticides in the marine environment of the Baltic Sea and water courses discharging to the Baltic Sea. The codes of BEP for the use of pesticides included in Attachment 1 should be applied by the CP.            d) The environmentally sound use of pesticides should be encouraged by informing and educating farmers and advisors along the lines indicated in Attachment 2;            e) Alternative methods of control of agricultural pests and weeds should be developed and their use encouraged wherever appropriate,            recommends also that the CP should report to the Commission on their national measures taken in accordance with this Recommendation in 1997 and every three years thereafter, recommends further that information on results of investigations and approved technology should be exchanged between the CP.</p>

<b>HELCOM RECOMMENDATION</b>	<b>Recommendation regarding...</b>	<b>Recommends the Governments of the Contracting Parties to the Helsinki Convention that...</b>
RECOMMENDATION 19/5 adopted 26 March 1998, having regard to Article 13, Paragraph b) of the Helsinki Convention	HELCOM objective with regard to hazardous substances	... the efforts to reduce discharges, emissions and losses of hazardous substances likely to reach the marine environment, to levels that are not harmful to man or nature as soon as possible and in a stepwise process and time-frame, have to be continued the Strategy to implement the HELCOM Objective with regard to hazardous substances as appears in the Attachment has to be applied, and every endeavour to move towards the target of the cessation of discharges, emissions and losses of hazardous substances, set up by the Kalmar Communique of the CBSS, 1996, by the year 2020 has to be made, decides that the Strategy to implement the HELCOM Objective with regard to hazardous substances should be reviewed by the Technological Committee when needed, but not later than in the year 2004, and updated if appropriate, inter alia, in line with the relevant strategy applied within OSPAR, recommends further that the CP report to the Commission via the Technological Committee every three years starting in 2003.
RECOMMENDATION 19/ adopted 26 March 1998, having regard to Article 13, Paragraph b) of the Helsinki Convention	Amendments to Annex III of the Helsinki Convention concerning regulations on prevention of pollution from agriculture	resolves: a) to adopt amendments to Annex III of the Helsinki Convention appearing in the Attachment to this Recommendation, b) to ask the Depositary Government to communicate amendments to the Contracting Parties with the Commission's recommendation for acceptance, c) to determine that amendments shall be deemed to have been accepted unless prior to 1 January 1999 any of the Contracting Parties has objected to the amendments, and d) to determine that the accepted amendments shall enter into force on 1 January 2000, resolves also to amend accordingly Annex III to the Convention on the Protection of the Marine Environment of the Baltic Sea Area, 1992 at the date of entry into force of the accepted amendments, if this Convention entered into force prior to these amendments, urges that: a) the Governments of Denmark, Finland, Germany and Sweden shall develop programmes for the implementation of measures referred to in Part II of Annex III by 1 January 2000 and implement them by 1 January 2002, b) the Governments of Estonia, Latvia, Lithuania, Poland and Russia shall develop programmes for the implementation of measures referred to in Part II of Annex III and implement them as soon as possible but not later than 1 January 2002 and 1 January 2011, respectively, requests the Governments of the Contracting Parties to report on the progress of implementation in accordance with the agreed deadlines.
RECOMMENDATION 20/2 adopted 23 March 1999 having regard to Article 13, Paragraph b) of the Helsinki Convention 1974	Approval of pesticides (plant protection products) for use in the catchment area of the Baltic Sea	... no approval for the use in the catchment area of the Baltic Sea shall be granted to pesticides identified as problematic according to the Criteria as contained in Appendix 1, and they should also apply these criteria not later than the year 2003, ... that the national registers of approved pesticides should be published annually, decides that the Technological Committee will propose when appropriate the amendments

HELCOM RECOMMENDATION	Recommendation regarding...	Recommends the Governments of the Contracting Parties to the Helsinki Convention that...
		to the list of banned substances used as pesticides in the Baltic Sea Area and its catchment area (Annex I, Parts 2 and 3 of Helsinki Convention 1992), recommends further that the CP report to the Commission every three years starting in 2003.
RECOMMENDATION 20/3 adopted 23 March 1999 having regard to Article 13, Paragraph b) of the Helsinki Convention 1974	Reduction of nutrients and other pollutants leaching from forestry land	<p>... that the following practices should be promoted in forest management, taking into account the best environmental practice (BEP) and the best available technology (BAT):</p> <p>a) Sufficient buffer strips (zones), to minimize leaching of nutrients and other pollutants, should be determined according to the latest available scientific knowledge, taking into account the characteristic of the soils, the shape of the landscape, the hydrological conditions, etc. These should be left between the shoreline of sea, lakes, streams and brooks and sites of forestry operations such as clear felling, scarification and prescribed burning (site preparation), fertilizing and spreading of pesticides;</p> <p>b) Large clear felling areas should be avoided. The size and the shape of clear felling areas should be planned with great care and consideration to site conditions and local conditions in order to reduce the release of nutrients into water; this includes the obligation of the Contracting Parties to specify the selected size(s) of clear felling areas by reporting on the underlying national regulations and measures;</p> <p>c) In maintenance of drainage systems water protection should be taken into account;</p> <p>d) The first-time drainage of wetlands in natural state should only take place where the leaching of nutrients is expected to be minimized and if it is supported by an environmental impact assessment, except for drainage projects of limited size, time and impact;</p> <p>e) The deep ploughing of restocking sites on mineral soils should be restricted to minor areas where alternative methods would be excessively expensive and ineffective or environmentally undesirable;</p> <p>f) The use of pesticides in forestry - for example the control of woody weeds by foliar application in the afforestation of former farmlands - should be restricted only to exceptional conditions and unavoidable minimum;</p> <p>g) Readily soluble fertilizers should be applied as little as possible and should be used according to the needs of plants and not during weather conditions favourable to ground water or surface water pollution (e.g. frozen or water saturated soils, snow etc.);</p> <p>h) The fertilizing of naturally nutrient rich forest sites as well as nitrogen fertilization in areas saturated with air borne nitrogen (exceedance of critical loads and/or levels) should be stopped. This does not apply to measures for the purpose of soil protection or to safeguard forests endangered by soil acidification where alternative methods would be excessively expensive and ineffective;</p> <p>i) The time between harvest and regeneration should be minimized and management of forests should be encouraged to keep the forests vigorous and well growing in order to reduce the release of nutrients,</p> <p>... that the actions in a) - i) should be implemented by the Contracting Parties not later than</p>

HELCOM RECOMMENDATION	Recommendation regarding...	Recommends the Governments of the Contracting Parties to the Helsinki Convention that...
		<p>in the year 2002,  ... that the actions taken by the Contracting Parties, e.g. economic incentives, recommendations, regulations and forestry advice, should be reported to the Commission in 2000 and thereafter every six years. Reports should as far as possible include the best possible estimates of the amount of leaching of nutrients and pollutants caused by forest management. Additionally, national regulations concerning the application of paragraph b) should be reported to the Commission one year after adoption of the Recommendation at the latest.</p>

**Tab. II: EC Directives relevant for the HELCOM Hazardous Substances work with regard to pesticides**

Council Directive	Related activities	Substances addressed
Council Directive 91/414/EEC provides the framework for the authorisation, the placing of plant protection products on the market and its use in the European Union.	A working programme for all existing active substances is set up by the Directive (Art. 8(2)). All active substances on the market in Member States on 25 July 1993 must undergo a full evaluation verifying whether they fulfil the obligations of Art. 5 and therefore can be listed in Annex I of the Directive. This list contains active substances whose use in plant protection products is considered safe.	proposed ban of organotins as plant protection products non-inclusion of Quintozene and Lindane in Annex I
Council Directive 98/8/EC on placing on the market of biocides.	After full implementation of this Directive, all active substances have to be assessed and approved on the Community level and all the biocidal products have to be authorised by the Member States. If the result of the assessment is that an active substance can be used in a biocidal product, it will be put on a positive list accompanied with the requirements on that use.	PCP, PAH (creosote), TBT, Lindane
Council Directive 79/117/EEC prohibiting the placing on the market and use of plant protection products containing certain active substances.		DDT, Lindane, Aldrin, Chlordane, Dieldrin, Endrin, HCH, Hexachlorobenzene, Camphechlor, Mercury.
Council Directive 76/769/EEC on the approximations of the laws, regulations, and administrative provisions of the Member States relating to restrictions on the marketing and use of certain dangerous substances and preparations. According to Council Regulation 793/93/EEC on the systematic evaluation and control of the risks of existing substances risk assessments are carried out and risk reduction strategies are developed, possibly resulting in amendments under Council Directive 76/769/EEC.	National information on the import, production, stockpiling, use and export of substances is requested. Marketing and use restrictions based on evaluation of risk as well as socio-economic considerations. 4 priority lists (containing about 150 substances and identified Rapporteur Member States) have been established for carrying out the risk assessment work under regulation no 793/93 (2001).	9 <sup>th</sup> amendment: 91/173/EEC: restricts use (with exceptions) of pentachlorophenol (PCP) for wood preservation in concentrations greater than 0.1% by mass. 1999/51/EC: PCP and its salts and esters shall not be used in concentrations equal to or greater than 0.1 % by mass in substances or preparations placed on the market. Member States shall apply appropriate provisions as from 1 <sup>st</sup> September 2000. The use of PCP, NaPCP and PCPL will cease by the end of 2008 in all EU Member States. 94/60/EC: PAH (Creosote)
2000/76/EEC on waste incineration	Emission limit values on emissions of particles and total organic matter from incineration of all type of waste. This is of relevance when e.g. incinerating obsolete pesticides.	e.g. PAH, PCDD/PCDF, mercury
Directive 1999/31/EEC on the landfill of waste provides that only treated waste can be landfilled.	Provides measures, procedures and guidance to prevent or reduce pollution of surface waters, ground water, soil and air from landfills of waste This could be of relevance when e.g. landfilling obsolete pesticides.	Waste containing HELCOM Hazardous substances needs appropriate treatment before landfilling; in particular relevant for metals where there may be borderline cases.

Council Directive	Related activities	Substances addressed
<p>Council Directive 2000/60/EC of the European Parliament and of the council establishing a framework for Community action in the field of water policy (Water Framework Directive).</p>	<p>This Directive contains provisions on measures aimed at progressively reducing (for priority substances) and at ceasing or phasing out (for priority hazardous substances, within 20 years) discharges, emissions and losses as well as identification of these priority substances and hazardous priority substances (emission inventories according to Article 13(4)). This is the same objective as for Recommendation 19/5 substances. Of special relevance to the work of the Project Team on Hazardous Substances are Article 1 (c) (...cessation of discharges, emissions and losses of priority hazardous substances), Article 2 (29-31), Article 4 (a (iv)), Article 16 (Strategies against pollution of water) and Annexes VIII-X). The EC has two years to propose control measures necessary to reach the objectives for priority (hazardous) substances. These substances will have to be monitored as mandatory parameters under the WFD. Non-compliance with the requirements of the WFD leads to penalties.</p>	<p><u>proposed priority hazardous substances:</u>  pentaBDPE Cd, SCCPs, HCB, HCH, Hg, NP/NPEs, PAHs, Petachlorobenzene, Tributyltin compounds, Hexachlorobutadiene</p> <p><u>proposed possible priority hazardous substances:</u>  other brominated diphenylether (PBDF) Dibutylphthalate and Diethylhexylphthalate, Pb, PCP, Naphthalene, Anthracene, Atrazine, Chlorpyrifos, Endosulfan, Trifluralin, Trichlorobenzenes, Octylphenols)</p> <p><u>proposed other priority substances:</u>  Alachlor; Benzene; Chlorfenvinphos; Dichloromethane; 1,2-Dichloromethane; Diuron; Isoproturon; Nickel; Simazine; Trichloromethane (also subject to emission controls and quality standards in accordance with Article 16 of the Water Framework Directive)</p>
<p>Council Directive 76/464/EEC on pollution caused by certain dangerous substances discharged into the aquatic environment of the Community.</p>	<p>Established two lists of substances classified as hazardous. List I identified 129 substances to be eliminated from the environment because of their toxicity and their bio-accumulation. List II contained those, which have a detrimental impact on the environment but which may be contained within a given area depending on the characteristics and location of the area. The Directive required Member States to draw up authorisation limits for emissions of substances on both lists and set up pollution programmes. The Directive set up a framework for the elimination or reduction of discharges of dangerous substances to inland and coastal waters through six daughter directives which established emission limits for specific substances on List I of the Annex to the Directive.</p>	
<p>Council Directive 86/280/EEC on limit values and quality objectives for discharges of certain dangerous substances included in List I of the Annex to Directive 76/464/EEC (Council Directive 76/464/EEC of 4 May 1976 on pollution caused by certain dangerous substances discharged into the aquatic environment of the Community)</p>	<p>This Directive lays down, pursuant to Article 6 of Directive 76/464/EEC, limit values for emission standards for the substances referred to in Article 2 in discharges from industrial plants, quality objectives in the aquatic environment, time limits for compliance, reference methods of measurement. It establishes a monitoring procedure, requires Member States to cooperate and to draw up programmes to avoid or eliminate pollution arising from the sources referred to in Article 5. The</p>	<p>DDT, the Drins, PCP, Hexachlorobenzene</p>

Council Directive	Related activities	Substances addressed
	Directive applies to the waters referred to in Article 1 of Directive 76/464/EEC, with the exception of ground water.	
Council Directive 80/68/EEC on the protection of groundwater against pollution caused by certain dangerous substances.	Replaces Article 4 of Council Directive 76/464/EEC. Its aim is to prevent the direct or indirect introduction of substances in List I and limit the substances in List II of the Annex to groundwater supplies. It will become part of the overall approach of the draft Community Water Policy Framework Directive.	
Council Directive 67/548/EEC concerning the classification and labelling of dangerous substances and preparations.	Dangerous substances, which are placed on the market have to be labelled according to their classification in Annex I of Directive 67/548/EEC, which in 2001, contains approximately 2350 existing and 214 new substances. For dangerous substances not in Annex I, the manufacturer, distributor and importer is obliged to apply a provisional classifications and labelling following the criteria in Annex VI of this directive.	2350 existing and 214 new substances.
Council Directive 96/61/EC concerning integrated pollution prevention and control (IPPC). The objective is to prevent or minimise air, water and soil pollution by emissions from industrial installations in the Community, with a view to achieving a high level of environmental protection.	This Directive requires the assessment of chemicals used in certain production processes and certain conditions for the licensing of industrial installations. In the context of the execution of the Directive so called BAT notes are elaborated laying down requirements for progressive technologies. Such BAT notes are foreseen e.g. for PCB sources such as certain combustion sources (for power generation and waste incineration) and production and processing of metals. Article 15 (3) of the Directive requires Member States to inventory and supply data on principal emissions and responsible sources, that is from all large facilities with one or more activities as mentioned in Annex I to this Directive. According to this Article 15 the Commission decided on the implementation of an European Pollutant Emission Register (EPER).	e.g. PCP, HCB, HCH, PCDD + PCDF (dioxins and furans), Organotin compounds, sectors, where hazardous substances are emitted: energy industries, production and processing of metals, mineral industry, chemical industry and chemical installations for the production of basic organic chemicals, basic inorganic chemicals or fertilisers, biocides, pharmaceuticals; pulp and paper industry, textile pre-treatment and finishing, etc.
White Paper on the Commission on a new Chemicals Policy in Europe	<p>aimes to</p> <ul style="list-style-type: none"> <li>▪ place more responsibility on down stream users of dangerous chemicals</li> <li>▪ to phase out PTBs except for application for which a safe use can be demonstrated in an authorisation procedure</li> <li>▪ establishing substitution as one of the guiding principles for the future EU chemicals policy</li> </ul>	PTB substances



**Tab. III: Legal situation concerning the selected substances used as pesticides in the Contracting Parties**

No.	Cas-No.	Pesticides	DEN	EST	FIN	GER	LAT	LIT	POL	RUS	SWE
1	106-93-4	1,2-Dibromoethane	prohibited	banned 1999	banned 1996	banned	banned 2000	banned	no reg (1965)	banned	never reg/us
2	93-76-5	2,4,5-T	not app.	banned 1999	banned 1977	banned	no registration	banned	no reg (1985)		banned 1977
3	107-13-1	Acrylonitrile	never app.	banned 1999	never reg/us	banned	banned 2001	no registration	no reg (1965)	no registration	never reg/us
4	140-57-8	Aramite	never app.	banned 1999	never reg/us	banned	no registration	banned 1987	no reg (1965)		never reg/us
5	319-85-7	beta-HCH	banned 1994			banned	ban 1986, 2000	banned	no reg (1965)	no registration	never reg/us
6	57-74-9	Chlordane	not app.	banned 1967	banned 1969	banned 1977	banned 2000	banned	no reg (1965)		banned 1971
7	143-50-0	Chlordecone	not app.	banned 1999	never reg/us	banned	no registration	banned	no reg (1965)		banned 1978
8	6164-98-3	Chlordimeform	never app.	banned 1999	never reg/us	banned	no registration	banned	no reg (1977)	no registration	never reg/us
9	50-29-3	DDT	banned 1984	banned 1967	banned 1976	banned	ban 1966, 2000	banned	no reg (1973)	banned 1972	banned 1975
10	309-00-2	Aldrin	use wd. 1963	banned 1967	banned 1972	banned 1981	ban 1972, 2000	banned 1987	no reg (1976)	no registration	banned 1970
11	60-57-1	Dieldrin	last sale 1988	banned 1967	banned 1972	banned	banned 2000	banned 1987	no reg (1976)		banned 1970
12	72-20-8	Endrin	never app.	banned 1967	banned 1969	banned	banned 2000	banned	no reg (1971)		banned 1966
13	465-73-6	Isodrin	never app.	banned 1999	never reg/us	banned	banned 2000	no registration	no reg (1965)		never reg/us
14	144-49-0	Fluoroacetic acid & derivates	never app.	banned 1999	never reg/us	banned	no registration	no registration	no reg (1965)	no registration	not used/ exemptions
15	608-73-1	HCH	nevert app.	banned 1967	ban 1972-96	banned	ban 1986, 2000	banned	no reg (1976)	no registration	never reg/us
16	76-44-8	Heptachlor	never app.	banned 1967	banned 1993	banned	ban 1986, 2000	banned	no reg (1967)	banned 1982	never reg/us
17	118-74-1	Hexachlorobenzene	never app.	banned 1999	banned 1996	banned	banned 2000	ban ned2001	no reg (1979)	(banned 1986)	banned 1980
18	297-78-9	Isobenzane	not app.	banned 1999	never reg/us	banned	no registration	no registration	no reg (1965)	banned in USSR	never reg/us
19	4234-79-1	Kelevan	never app.	banned 1999	never reg/us	banned	no registration	no registration	no reg (1984)		never reg/us
20	58-89-9	Lindane	banned 1995	banned 1967	ban 1972-96	banned	ban 1986, 2000	banned	no reg (1991)	banned 1987	banned 1989
21	2385-85-5	Mirex	not app.	banned 1967	never reg/us	never reg/us	no registration	banned	no reg (1965)	no registration	never reg/us
22	4636-83-3	Morfamquat	not app.	banned 1999	never reg/us	banned	no registration	no registration	no reg (1965)		never reg/us
23	1836-75-5	Nitrophen	last sale 1978	banned 1999	banned 1996	banned	banned 2000	banned	no reg (1984)	banned 1997	banned 1979
24	87-86-5	Pentachlorophenol	last sale 1978	banned 1999	banned 2000	banned 1989	no registration	banned	no reg (1967)	banned in USSR	banned 1978
25	82-68-8	Quintozene	last sale 1984	banned 1999	banned 1996	banned	banned 2000	no registration	no reg (1988)		banned 1985
26	8001-35-2	Toxaphene	not app.	banned 1967	banned 1969	banned	banned 2000	banned	not used*		never reg/us

All information is related to the registration and use as a pesticide.

use wd.

pesticide use withdrawn

never/not app.

never/not approved for use as pesticide

never reg/us

never registered or used as a pesticide

no reg

no registration/licensing for marketing and use as a pesticide (in brackets: since the year ...)

\*\*

application for registration is possible

**Tab. IV: Types of pesticides and their function**

Type	Function
Algicides	Control algae in lakes, canals, swimming pools, water tanks, and other sites.
Antifouling agents	Kill or repel organisms that attach to underwater surfaces, such as boat bottoms.
Antimicrobials	Kill microorganisms (e.g. bacteria, viruses).
Attractants	Attract pests (e.g., to lure an insect or rodent to a trap).
Biocides	Kill microorganisms
Disinfectants and sanitizers	Kill or inactivate disease-producing microorganisms on inanimate objects.
Fungicides	Kill fungi (including blights, mildews, molds, and rusts).
Fumigants	Produce gas or vapor intended to destroy pests in buildings or soil.
Herbicides	Kill weeds and other plants that grow where they are not wanted.
Insecticides	Kill insects and other arthropods.
Miticides/acaricides	Kill mites that feed on plants and animals.
Microbial pesticides	Microorganisms that kill, inhibit, or out compete pests, including insects or other microorganisms.
Molluscicides	Kill snails and slugs.
Nematicides	Kill nematodes (microscopic, worm-like organisms that feed on plant roots).
Ovicides	Kill eggs of insects and mites.
Pheromones	Biochemicals used to disrupt the mating behavior of insects.
Repellents	Repel pests, including insects (such as mosquitoes) and birds.
Rodenticides	Control mice and other rodents.
Defoliants	Cause leaves or other foliage to drop from a plant, usually to facilitate harvest.
Desiccants	Promote drying of living tissues, such as unwanted plant tops.
Insect growth regulators	Disrupt the molting, maturity from pupal stage to adult, or other life processes of insects.
Plant growth regulators	Substances (excluding fertilizers or other plant nutrients) that alter the expected growth, flowering, or reproduction rate of plants.

**Tab. V: Pesticides of concern in different forums**

	CAS No	Name	SC-POP	LRTAP	OSPAR	HELCOM	WFD
1	106-93-4	1,2- Dibromoethane				X	
2	93-76-5	2,4,5-T				X	
3	107-13-1	Acrylonitrile				X	
4	319-85-7	beta-HCH				X	
5	57-74-9	Chlordane	X	X		X	
6	143-50-0	Chlordecone (Kepone)		X		X	
7	6164-98-3	Chlordimeform				X	
8	50-29-3	DDT	X	X		X	
9	309-00-2	Aldrin	X	X		X	
10	60-57-1	Dieldrin	X	X		X	
11	72-20-8	Endrin	X	X		X	
12	465-73-6	Isodrin			X	X	
13	144-49-0	Fluoroacetic acid & derivatives				X	
14	608-73-1	HCH		X	X	X	X
15	76448	Heptachlor	X	X		X	
16	118-74-1	Hexachlorobenzene	X	X		X	X
17	297-78-9	Isobenzane				X	
18	4234-79-1	Kelevan				X	
19	58-89-9	Lindane		X		X	
20	2385-85-5	Mirex	X	X		X	
21	4636-83-3	Morfamquat				X	
22	1836-75-5	Nitrophen				X	
23	87-86-5	Pentachlorophenol (PCP)			X	X	X
24	82-68-8	Quitozene				X	
25	8001-35-2	Toxaphene	X	X		X	

SC-POP: Stockholm Convention on Persistent Organic Pollutants, 2001

LRTAP Convention on Long Range Transboundary Air Transport of Pollutants, 1979

OSPAR: OSPAR Strategy with regard to Hazardous Substances - Generation target, 1998  
Oslo and Paris Commissions

HELCOM HELCOM Strategy with regard to Hazardous Substances – Recommendation 19/5, 1998  
Helsinki Commission

WFD: Water Framework Directive 2000/60/EC - Prioritised substances, 2001

**Tab. VI: Abbreviations**

a.i.	active ingredient
Art.	article
BAT	Best Available Technology
BCF	Bioconcentrationfactor
BEP	Best Environmental Practice
BHC	Benzene hexachloride
BUA	Beratergremium umweltrelevanter Altstoffe
CEEC	Central and Eastern European Countries
CPs	Contracting Parties
DANCEE	Danish Co-operation for Environment in Eastern Europe
DBE	1,2-Dibromoethane
DDT	Dichlorodiphenyltrichloroethane
EC	European Community
EEC	European Economic Community
e.g.	exempli gratia / for example
EU	European Union
FAO	Food and Agriculture Organization
FRG	Federal Republic of Germany
GDR	German Democratic Republic
HCB	Hexachlorobenzene
HCH	Hexachlorocyclohexane
HELCOM	Helsinki Commission (Baltic Marine Environment Protection Commission)
info	information
IPCS	The International Programme on Chemical Safety
IPM	Integrated Pest Management
IRPTC	International Register of Potentially Toxic Chemicals
IUCLID	International Uniform Chemical Information Database
KEMI	Swedish National Chemicals Inspectorate
kg	Kilogram
LRTAP	Long Range Transboundary Air Transport of Pollutants
log K <sub>OW</sub>	logarithm of octanol-water-partition coefficient
NIS	Newly Independent States
NaPCP	Natrium Pentachlorophenol
OSPAR	Oslo and Paris Commissions
PCP	Pentachlorophenol
PCPL	PCP's ester Pentachlorophenyl laurate
POP	Persistent Organic Pollutants
PPP	Plant Protection Product
t	Ton
TCDD	tetrachlorodioxin
USSR	United Socialist Soviet Republics
US EPA	United States Environmental Protection Agency
2,4-D	2,4-dichlorophenoxyacetic acid
2,4,5-T	2,4,5-trichlorophenoxyacetic acid

