Revised report to
DG Environment

Study on enhancing the Endocrine Disrupter priority list with a focus on low production volume chemicals

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Appendices

1 PREFACE

By letter of 10 November 2005, the European Commission, DG Environment (DG ENV) commissioned DHI Water & Environment (DHI) to conduct a study entitled "Study on enhancing the Endocrine Disrupter priority list with a focus on low production volume chemicals" (reference: ENV.D.4/ETU/2005/0028r). This study is a follow-up study for the establishment by the Commission of a priority list of substances for further evaluation of their role in endocrine disruption. Two studies in this area were previously carried out by BKH in 2000 and by RPS BKH in 2002. The present study is thus the last of three evaluations going through the list of candidate substances from the EU candidate list including 553 substances.

Project coordinator for the present project for the EC was Katharina Spens (DG ENV) from beginning of the project and until May 2006 and hereafter Reinhild Puergy (DG ENV) took over. The project coordinator for DHI is Gitte I. Petersen.

A kick-off meeting with the Commission (DG ENV) on the set-up of the project was held on 15 November 2005. Furthermore, meetings with the Commission were held on 15 March 2006 (evaluation of the list of substances to be evaluated), on 29 June 2006 (interim report meeting) and on 8 December 2006 (discussion of final deliverables).

It should be noted that the results of this study (as the results of the two previous studies) will be used as a basis for the consultation process by the Commission. This consultation process constitutes the third step in the establishment of a priority list of substances for further in depth evaluation of their role in endocrine disruption, as outlined in the Commission Communication to Council and European Parliament on a Community Strategy for Endocrine Disrupters COM(2001)262 of June 2001.

2 EXECUTIVE SUMMARY

The present study "Study on enhancing the Endocrine Disrupter priority list with a focus on low production volume chemicals" is a follow-up study for the establishment of a priority list of substances to be used for further in-depth evaluation of their role in endocrine disruption. Two previous studies in this area were carried out by BKH in 2000 and by RPS BKH in 2002. The present study is thus the latest of three evaluations working up the EU candidate list that included 553 substances in total. For reasons of consistency, as the present study is the last of three evaluations of the candidate substances, the methodology for substance evaluation used in the previous RPS-BKH 2002 project was applied.

In the present study, the remaining substances (mainly Low Production Volume Chemicals (LPVC)) from the candidate list were evaluated. A priority list of substances was prepared. The ranked priority list is based on this evaluation together with the evaluations performed in the two previous studies.

The compilation of the priority list was based on a screening of available literature and should therefore be regarded as a starting point for further in-depth evaluation of the substances placed on the priority list with highest priority given to substances placed in the Category 1 group (clear evidence for endocrine disrupting effects in an intact organism). The evaluations shall be seen in line with the previous studies and are NOT considered comprehensive risk assessments. In the future in-depth evaluations, a methodology needs to be developed to make the list iterative, i.e. that a substance can enter or be deleted from the list on the basis of an agreed approach.

The subject of this project falls under the short-term priority actions in the current priority of the implementation of the Community Strategy on EDS.

The following study approach was applied:

- Identification of relevant stakeholders
- Identification of new candidate substances
- Collection and evaluation of data/information on candidate substances
- Evaluation of exposure to humans and wildlife
- Update of database and priority list of substances

In the very beginning of the project, 160 stakeholders were identified and invited to go through the candidate list of substances to be evaluated in the project. Stakeholders were invited to forward potential information on the candidate substances as well as asked to identify new substances, if any, to the list. During this task, 22 new candidate substances were identified.

During a thorough evaluation of the compiled candidate list (173 substances from the ordinary list + 22 new candidate substances), it was found that, most probably, several substances were no longer in use. It was also found that few of the substances were High Production Volume Chemicals (HPVC) and that the majority of the substances

were neither HPVC nor LPVC. They are existing substances but they are produced or imported in amounts ≤10 tons per year.

Based on this information, it was decided that the present study should only include HPVC and LPVC plus existing substances registered in the ECB-ESIS database although they were produced or imported in amounts ≤10 tons per year. Based on a close examination of the candidate substances list including the 22 new substances added by the invited stakeholders (195 substances), it turned out that 73 substances could not be found on the ESIS database and no CAS No. were identified for 15 substances. In total, 107 substances remained for the present evaluation.

As already outlined, the outcome of the present study shall be consistent with the outcome of the previous studies and end up in a ranked priority list of substances.

The categorisation of the substances was performed according to the following evaluation criteria:

CAT 1	At least one *in-vivo* study providing clear evidence for endocrine disruption in an intact organism.
CAT 2	Potential for endocrine disruption. *In-vitro* data indicating potential for endocrine disruption in intact organisms. Also includes effects *in-vivo* that may, or may not, be ED-mediated.
CAT 3a	No scientific basis for inclusion in list (ED studies available but no indications of ED effects)
CAT 3b	Substances with no or insufficient data gathered

Several studies were included and evaluated in accordance with screening criteria but only one study was selected as the key study and the categorisation of the substance was thus mainly based on the key study. All evaluated studies are reflected in the database. However, it should be emphasized that the amount of evidence provided by other studies not selected key studies (all of which are included in the database) has influenced the conclusions as to categorisation as well. The choice of catetories was made solely by the consultant, and apart from the clear evaluation criteria for the categories given above, it may thus be regarded as subjective.

For all Category 1 substances, monitoring data were searched. However, only a few monitoring data were found and it was thus decided to base the exposure evaluations on EUSES calculations. EUSES is designed to be a decision support system for the evaluation of the exposure of chemicals to man and the environment. The overall results and output from the EUSES modelling include among other things:

- Release to the environment on local, regional and continental scale
- Concentration in water, soil and sediment on local scale (highest concentration)
- Concentration in water and sediment local, regional and continental
- Concentration in fish for secondary poisoning (fresh water)
- Concentration in fish-eating marine top predators
- Concentration in earthworms from agricultural soil

Based on an evaluation of the results of the EUSES calculations together with an evaluation of the Use Category (e.g. cosmetics, pesticide etc.), a subjective evaluation of exposure concern (high, medium, low) was performed. E.g., if a substance turned out to be readily biodegradable but used in cosmetics, a relatively high human exposure can be foreseen and the substance was rated as 'high concern'. It shall be clearly emphasized that the exposure evaluation is not a risk assessment and that the choice of categories (high, medium, low concern) was made solely by the consultant.

A brief overview, the historical evaluation process of the candidate substances and the number of priority substances (CAT 1 substances) is presented in Table 2.1.

Table 2.1 Overview of candidate list substances

Selection criteria	Number of substances	Number of substances	CAT 1 substances
Original candidate list of substances with ED effects	**565**	**565**	
Excluded at the ED expert meeting of 1999	12		
Candidate list of substances with ED effects, 2000	**553**	**553**	
HPV already restricted or banned (109) + WRc evaluation (9)	118		66
Remaining substances	**435**	**435**	
HPV and/or persistent and/or high exposure (evaluation by RPS BKH 2002)	204		94
Group names (not to be evaluated)	13		
Mixtures or polymers (not to be evaluated)	41		
Substances twice in list (not to be evaluated)	4		
Remaining substances on the candidate list to be evaluated in the DHI 2006 project	**173**	**173**	
New substances identified by stakeholders	22		
Total number of substances to be evaluated in the DHI 2006 project	**195**	**195**	
Not in ESIS database (excluded from the evaluation)	73		
No CAS No (excluded from the evaluation)	15		
Final number of substances evaluated in the DHI 2006 project	**107**	**107**	34
Total number of priority substances (Category 1)			**194**

A brief overview (CAS No, substance name, Use Category; exposure evaluation and legal status) of CAT 1 substances identified in the present study is given in Table 2.2.

Table 2.2 Brief overview of evaluated substances which have showed evidence of endocrine disrupting effects in an intact organism (CAT 1 substances)

CASNR	NAME	Conclusion
10043-35-3	Boric acid	**Boric acid** is used in consumer products as e.g. cosmetics and is according to the ESIS database a HPV substance. For the EUSES calculations a production volume of 50000 tones per year has been used. Boric acid is not bioaccumulative and is readily biodegradable in the environment. EUSES calculations for secondary poisoning shows that the substance is not accumulated in significant amounts in fish and top predators. A relatively high human exposure is however expected due to the defined use of the substance. Based on these evaluations Boric acid is considered as being of **Medium Concern.** Presently no EU classification is applied to Boric acid. A risk assessment on Boric acid is at the moment being performed by Austria. Proposed classification: R62; R63
104-40-5	4-Nonylphenol (4-NP)	**Nonylphenol (NP)** is widely used as a component of detergents, paints, pesticides, and many other formulated products. 4-Nonylphenol is produced is low amount and is according to the ESIS database neither a HPV or LPV substance. 4-Nonylphenol is not readily biodegradable and has a high potential to bioaccumulate (log Kow=5.76). 4-Nonylphenol is in the environment mainly distributed to surface water as well as sediments and agricultural soils. Based on EUSES estimations for secondary poisoning 4-Nonylphenol is expected to be found both in fish and top predators in concentrations up to 1000 mg/kg wet weight. Local daily human intake is estimated to be up to 250 mg/kg body weight per day. Due to an expected close human contact to 4-Nonylphenol via detergents and paints, 4-Nonylphenol is considered as being of **High Concern**. In the EU there is a restriction on the use of nonylphenol and its ethoxylates (Annex I of Directive 76/769/EEC) limiting the inclusion of these substances in a variety of products to no more than 0.1%. Proposed classification: Rep.3;R62 Rep.3;R63 Xn;R22 C;R34 N;R50/53
1113-02-6	Omethoate	**Omethoate** is used as a pesticide. Omethoate is according to the ESIS database a LPV substance. For the EUSES calculations a production volume of 500 tones per year has been used. Omethoate is not readily biodegradable, but has a low potential to bioaccumulate (log Kow=-0.75). Based on EUSES estimations Omethoate expected to be found in local surface water in concentrations up to 4 mg/L. As Omethoate is not potential bioaccumulative the substance is not expected to give any problems in relation to secondary poisoning. Omethoate is considered as being of **Low Concern.** Covered by Council Directive 91/414/EEC. No RAR has been provided and the substance is not included in the list for pesticides to be reviewed. Classification: XN;R21 T;R25 N;R50
1131-60-8	4-Cyclohexylphenol	**4-Cyclohexylphenol** is used in the formation of resin. Resin is widely used product. 4-Cyclohexylphenol is according to the ESIS database produced in low amount and is neither a HPV or LPV substance. For the EUSES calculations a production volume of 10 tones per year has been used. 4-Cyclohexylphenol is not readily biodegradable and has a high potential to bioaccumulate in the environment (log kow=4.22). 4-Cyclohexylphenol is in the environment mainly distributed to surface water as well as sediments and agricultural soils. Based on EUSES estimations for secondary poisoning 4-Cyclohexylphenol is expected to be found in fish and top predators in minor amount. A medium human exposure is expected. 4-Cyclohexylphenol is considered as being of **Medium Concern.** None specifically regulatory or legal status for this substance was found, however the substance is related to nonylphenol.

CASNR	NAME	Conclusion
120-47-8	ethyl 4-hydroxybenzoate	**Ethyl 4-hydroxybenzoate** is used as preservatives in food, pharmaceutical and cosmetic formulations. Ethyl 4-hydroxybenzoate is produced in amounts up to 50 tones per year and thus a LPV substance. Ethyl 4-hydroxybenzoate is readily biodegradable and has a medium potential for bioaccumulation. Based EUSES calculations Ethyl 4-hydroxybenzoate is expected to be released to the environment in insignificant amounts and is not expected to give any problems in relation to secondary poisoning. However, as ethyl 4-hydroxybenzoate as a preservative in food and cosmetics a high human exposure is expected. Ethyl 4-hydroxybenzoate is thus considered as being of **Medium Concern**. None specifically regulatory or legal status for this substance was found.
131-18-0	Di-n-pentylphthalate (DPP) = Dipentylphthalate	Consumer and industrial applications for phthalates are numerous and range from making nail polish flexible and screwdriver handles less brittle to helping make the time-release coatings on numerous pharmaceutical products. **Dipentylphthalate** is according to the ESIS database a LPV substance. For the EUSES calculations a production volume of 50 tones per year has been used. Dipentylphthalate is inherently biodegradable and has a high potential to bioaccumulate (log Kow=5.62). Based on EUSES calculations dipentylphthalate is not expected to be found in significant amounts in the environment (surface waters and sediments). However as Dipentylphthalate is of medium concern in relation to secondary poisoning. Dipentylphthalate is thus considered as being of **Medium Concern.** None specifically regulatory or legal status for this substance was found.
131-55-5	Benzophenone-2 (Bp-2), 2,2',4,4'-tetrahydroxybenzophenone	**Benzophenone-2 (Bp-2), 2,2',4,4'-tetrahydroxybenzophenone** is used as a UV sunscreen in cosmetics. Benzophenone-2 (Bp-2), 2,2',4,4'-tetrahydroxybenzophenone is according to the ESIS database a LPV substance. For the EUSES calculations a production volume of 50 tones per year has been used. Benzophenone-2 (Bp-2), 2,2',4,4'-tetrahydroxybenzophenone is not readily biodegradable and has a medium potential to bioaccumulate. Benzophenone-2 (Bp-2), 2,2',4,4'-tetrahydroxybenzophenone is in the environment mainly distributed to surface water as well as sediments and agricultural soils. Based on EUSES estimations for secondary poisoning Benzophenone-2 (Bp-2), 2,2',4,4'-tetrahydroxybenzophenone is not expected to be found in fish and top predators. A high human exposure is expected mainly due to the fact that the substance is used as a UV screen in cosmetics. Benzophenone-2 (Bp-2), 2,2',4,4'-tetrahydroxybenzophenone is therefore considered as being of **High Concern.** None specifically regulatory or legal status for this substance was found.
131-56-6	2,4-Dihydroxybenzophenon = Resbenzophenone	**2,4-Dihydroxybenzophenon** is used as a UV sunscreen in cosmetics. 2,4-Dihydroxybenzophenon is according to the ESIS database a LPV substance. For the EUSES calculations a production volume of 50 tones per year has been used. 2,4-Dihydroxybenzophenon is not readily biodegradable and has a potential to bioaccumulate in the environment (log kow=2.96). 2,4-Dihydroxybenzophenon is in the environment mainly distributed to surface water as well as sediments and agricultural soils. Based on EUSES estimations for secondary poisoning 2,4-Dihydroxybenzophenon is not expected to be found in fish and top predators. A high human exposure is expected mainly due to the fact that the substance is used as a UV screen in cosmetics. 2,4-Dihydroxybenzophenon is therefore considered as being of **High Concern.** None specifically regulatory or legal status for this substance was found.

CASNR	NAME	Conclusion
131-70-4	Mono-n-butylphthalate	Consumer and industrial applications for phthalates are numerous and range from making nail polish flexible and screwdriver handles less brittle to helping make the time-release coatings on numerous pharmaceutical products. **Mono-n-butylphthalate** is according to the ESIS database produced in amounts < 10 tones/year and thus not a LPV substance. For the EUSES calculations a production volume of 10 tones per year has been used. Mono-n-butylphthalate is readily biodegradable and has a medium potential to bioaccumulate (log Kow=2.84). Based on EUSES calculations Mono-n-butylphthalate is not expected to be found in significant amounts in the environment (surface waters and sediments) and is not expected to give any problems in relation to secondary poisoning and human intake. Mono-n-butylphthalate is considered as being of **Low Concern.** None specifically reulatory or legal status for this substance was found. The related substance Dibutylphthalat is on the list of dangerous substances (Annex I to Directive 67/548/EEC)
13593-03-8	Quinalphos = Chinalphos	**Quinalphos** is used as a insecticide. Quinalphos is according to the ESIS database a LPV substance. Quinalphos is not readily biodegradable and has a high potential to bioaccumulate (log Kow=4.44). Based on EUSES estimations Quinalphos expected to be found in local surface water in concentrations up to 2 mg/L. Due to the persistency of the substance and the high potential bioaccumulation Quinalphos is of medium concern in relation to secondary poisoning and daily human intake. Quinalphos is considered as being of **Medium Concern.** Quinalphos is **c**overed by Council Directive 91/414/EEC. No RAR has been provided and the substance is not included in the list for pesticides to be reviewed. Classification: XN;R21 T;R25 N;R50/53
15087-24-8	3-Benzylidene camphor (3-BC)	**3-Benzylidene camphor** is used as a UV sunscreen in cosmetics. 3-Benzylidene camphor is according to the ESIS database a LPV substance. For the EUSES calculations a production volume of 50 tones per year has been used. 3-Benzylidene camphor is not readily biodegradable and has a high potential to bioaccumulate in the environment (log kow=4.67). 3-Benzylidene camphor is in the environment mainly distributed to surface water as well as sediments and agricultural soils. Based on EUSES estimations for secondary poisoning 3-Benzylidene camphor is expected to be found in fish and top predators in minor amount. A high human exposure is expected mainly due to the fact that the substance is used as a UV screen in cosmetics. 2,4-3-Benzylidene camphor is therefore considered as being of **High Concern.** None specifically regulatory or legal status for this substance was found.

CASNR	NAME	Conclusion
1582-09-8	Trifluralin	**Trifluralin** is used as a pesticide and is according to the ESIS database a HPV substance. For the EUSES calculations a production volume of 10000 tones per year has been used. Trifluralin is not readily biodegradable and has a high potential to bioaccumulate in the environment (log kow=5.34). Trifluralin is in the environment mainly distributed to surface water as well as sediments and agricultural soils. Based on EUSES estimations for secondary poisoning 2,4- Trifluralin is expected to be found in fish and top predators in extremely high amounts. A high human exposure up to 70 mg/kg/day is expected. Trifluralin is in the present evaluation considered as being of **High Concern.** Trifluralin is covered by Council Directive 91/414/EEC. No RAR has been provided and the substance is not included in the list for pesticides to be reviewed. Classification: XI;R36 R43 N;R50/53. Finalised assessments review by EFSA. Agreement that there is only limited evidence for endocrine effects and that this was recorded at high dose levels and was hard to distinguish from systemic toxicity.
1634-04-4	methyl tertiary butyl ether (MTBE)	**Methyl tertiary butyl** ether is used as a petrol additive and is according to the ESIS database a HPV substance. For the EUSES calculations a production volume of 50000 tones per year has been used. Methyl tertiary butyl ether is not readily biodegradable and has a low potential to bioaccumulate in the environment (log kow=1.06). Methyl tertiary butyl ether is in the environment mainly distributed to surface waters. Based on EUSES estimations for secondary poisoning 2,4- Methyl tertiary butyl ether is expected to be found in fish and top predators in minor amount. A relatively low daily human intake is expected. Due to the fact that Methyl tertiary butyl ether is a high volume substance and not readily biodegradable relatively high concentrations in surface waters can be expected and Methyl tertiary butyl ether is thus considered as being of **Medium Concern.** RAR from 2002 is available on ESIS. Classification: F;R11 XI;R38
25013-16-5	tert.-Butylhydroxyanisole (BHA)	**Tert.-Butylhydroxyanisole (BHA)** is used as an antioxidant to preserve and stabilize the freshness of food and feed and is according to the ESIS database a LPV substance. BHA is not readily biodegradable and has a high potential to bioaccumulate in the environment (log kow=3.29). BHA is in the environment mainly distributed to surface water. Based on EUSES estimations for secondary poisoning BHA is not expected to be of significant concern. A relatively low daily human intake is expected. However, as BHA is added directly to food items to preserve and stabilize the freshness of food and feed a direct human exposure is obvious. BHA is thus considered as being of **High Concern.** None specifically regulatory or legal status for this substance was found.

CASNR	NAME	Conclusion
27193-28-8	Phenol, (1,1,3,3-tetramethylbutyl)- = Octylphenol	**Octylphenol** is used as a precursor to produce surfactants (ethoxylates) and in plastic products. Octylphenol is according to the ESIS database not a LPV substance. For the EUSES calculations a production volume of 10 tones per year has been used. Octylphenol is not readily biodegradable and has a high potential to bioaccumulate in the environment (log kow=5.5). Octylphenol is in the environment mainly distributed to surface water as well as sediments and agricultural soils. Based on EUSES estimations for secondary poisoning Octylphenol is expected to be of medium concern. A high local daily human intake is expected (up to approx. 170 mg/kg/day). Octylphenol is considered as being of **High Concern.** The PBT properties have been assessed by the EU and it was concluded that Octylphenol does not fulfil the PBT criteria. The database for p-tert.-octylphenol is very comprehensive, including a high quality multi-generation study. The EU CMR group recently decided that Octylphenol should not be classified for reprotoxic effects.
33204-76-1	2,6-cis-Diphenylhexamethylcyclotetrasiloxane - 2,6-cis-[(PhMeSiO)2(Me2SiO)2][	**Diphenylhexamethylcyclotetrasiloxane** is used for various purposes as e.g. breast implants and bearing grease. Diphenylhexamethylcyclotetrasiloxane is according to the ESIS database not a LPV substance. For the EUSES calculations a production volume of 10 tones per year has been used. Diphenylhexamethylcyclotetrasiloxane is not readily biodegradable and has a high potential to bioaccumulate in the environment (log kow=7.52). Diphenylhexamethylcyclotetrasiloxane is in the environment distributed to surface water as well as sediments and agricultural soils. Based on EUSES estimations for secondary poisoning Diphenylhexamethylcyclotetrasiloxane is expected to be of medium concern. A high local daily human intake is expected (up to approx. 275 mg/kg/day). Diphenylhexamethylcyclotetrasiloxane is considered as being of **High Concern.** None specifically regulatory or legal status for this substance was found.
36861-47-9	3-(4-Methylbenzylidene)camphor	**3-(4-Methylbenzylidene)camphor** is used as a UV sunscreen in cosmetics. 3-(4-Methylbenzylidene)camphor is according to the ESIS database a LPV substance. For the EUSES calculations a production volume of 50 tones per year has been used. 3-(4-Methylbenzylidene)camphor is not readily biodegradable and has a high potential to bioaccumulate in the environment (log kow=5.22). 3-(4-Methylbenzylidene)camphor is in the environment mainly distributed to surface water as well as sediments and agricultural soils. Based on EUSES estimations for secondary poisoning 3-(4-Methylbenzylidene)camphor is expected to be found in fish and top predators in amounts up to approx. 2000 mg/kg ww. A high human exposure is expected mainly due to the fact that the substance is used as a UV screen in cosmetics. 3-(4-Methylbenzylidene)camphor is therefore considered as being of **High Concern.** None specifically regulatory or legal status for this substance was found.

CASNR	NAME	Conclusion
4376-20-9	Mono 2 ethyl hexyl-phthalate (MEHP)	**Mono 2 ethyl hexylphthalate (MEHP**) is the major DEHP metabolite. MEHP is according to the ESIS database produced in amounts < 10 tones/year and thus not a LPV substance. For the EUSES calculations a production volume of 10 tones per year has been used. MEHP is not readily biodegradable and has a high potential to bioaccumulate (log Kow=4.73). MEHP is in the environment mainly distributed to surface water as well as sediments and agricultural soils. Based on EUSES calculations MEHP is expected to give minor problems in relation to secondary poisoning and human intake. Due to the persistency and high bioaccumulation potential Mono-n-butylphthalate is considered as being of **Medium Concern.** None specifically regulatory or legal status for this substance was found.
50-18-0	Cyclophosphamide	**Cyclophosphamide** is used as a insecticide as well as in chemotherapy. Cyclophosphamide is according to the ESIS database produced in amounts < 10 tones/year and thus not a LPV substance. For the EUSES calculations a production volume of 10 tones per year has been used. Cyclophosphamide is not readily biodegradable and has a low potential to bioaccumulate (log Kow=0.63). Based on EUSES estimations Cyclophosphamide is expected to be found in local surface water in concentrations up to approx. 1 mg/L. Based on EUSES estimations for secondary poisoning and human intake Cyclophosphamide is expected to be found in fish, predators and human food in minor amounts. Chlordimeform is considered as being of **Low Concern.** The substance is covered by Council Directive 91/414/EEC. No RAR has been provided and the substance is not included in the list for pesticides to be reviewed.
5466-77-3	2-ethyl-hexyl-4-methoxycinnamate	**2-ethyl-hexyl-4-methoxycinnamate** is used as a UV sunscreen in cosmetics. 2-ethyl-hexyl-4-methoxycinnamate is according to the ESIS database a HPV substance. For the EUSES calculations a production volume of 5000 tones per year has been used. 2-ethyl-hexyl-4-methoxycinnamate is readily biodegradable and has a high potential to bioaccumulate in the environment (log kow=5.8). 2-ethyl-hexyl-4-methoxycinnamate is in the environment mainly distributed to surface water as well as sediments and agricultural soils. Based on EUSES estimations for secondary poisoning 2-ethyl-hexyl-4-methoxycinnamate is expected to be found in fish and top predators in amounts up to approx. 70000 mg/kg ww. Furthermore a high regional human exposure is expected. Besides a high human exposure is expected mainly due to the fact that the substance is used as a UV screen in cosmetics. 2-ethyl-hexyl-4-methoxycinnamate is therefore considered as being of **High Concern.** None specifically regulatory or legal status for this substance was found.
556-67-2	Cyclotetrasiloxane	**Cyclotetrasiloxane** has numerous industrial and consumer applications and is according to the ESIS database a HPV substance. For the EUSES calculations a production volume of 50000 tones per year has been used. Cyclotetrasiloxane is not readily biodegradable and has a high potential to bioaccumulate in the environment (log kow=5.45). Cyclotetrasiloxane is in the environment mainly distributed to surface water. Based on EUSES estimations for secondary poisoning Cyclotetrasiloxane is expected to be found in fish and top predators in minor amounts. Cyclotetrasiloxane has a potential for human exposure as it is used in numerous industrial and consumer. Applications. Cyclotetrasiloxane is considered as being of **High Concern.** None specifically regulatory or legal status for this substance was found. Classification: REP3;R62 R53

CASNR	NAME	Conclusion
611-99-4	4,4'-Dihydroxybenzophe-non	**4,4'-Dihydroxybenzophenon** is used as a UV sunscreen in cosmetics. 4,4'-Dihydroxybenzophenon is according to the ESIS database produced in amounts < 10 tones/year and thus not a LPV substance. For the EUSES calculations a production volume of 10 tones per year has been used. 4,4'-Dihydroxybenzophenon is not readily biodegradable and has a medium potential to bioaccumulate in the environment (log kow=2.19). 4,4'-Dihydroxybenzophenon is in the environment mainly distributed to surface water. Based on EUSES estimations for secondary poisoning 4,4-Dihydroxybenzophenon is expected to be found in fish and top predators in minor amounts. A high human exposure is expected mainly due to the fact that the substance is used as a UV screen in cosmetics. 4,4-Dihydroxybenzophenon is therefore considered as being of **Medium Concern.** None specifically regulatory or legal status for this substance was found.
6164-98-3	Chlordimeform	**Chlordimeform** is used as a insecticide. Chlordimeform is according to the ESIS database produced in amounts < 10 tones/year and thus not a LPV substance. For the EUSES calculations a production volume of 10 tones per year has been used. Chlordimeform is not readily biodegradable and has a medium potential to bioaccumulate (log Kow=2.89). Based on EUSES estimations Chlordimeform is expected to be found in local surface waters in concentrations up to approx. 1 mg/L. Based on EUSES estimations for secondary poisoning and human intake Chlordimeform is expected to be found in fish, predators and human food in minor amounts. Chlordimeform is considered as being of **Low Concern.** Covered by Council Directive 91/414/EEC. No RAR has been provided and the substance is not included in the list for pesticides to be reviewed.
7400-08-0	p-Coumaric acid (PCA)	**p-Coumaric acid (PCA)** is a natural phenolic acid. PCA is according to the ESIS database produced in amounts < 10 tones/year and thus not a LPV substance. For the EUSES calculations a production volume of 10 tones per year has been used. PCA is readily biodegradable and has a low potential to bioaccumulate (log Kow=1.79). Based on EUSES estimations PCA is expected to be found in local surface water in concentrations up to approx. 1 mg/L. Based on EUSES estimations for secondary poisoning and human intake PCA is expected to be found in fish, predators and human food in insignificant amounts. PCA is considered as being of **Low Concern.** None specifically regulatory or legal status for this substance was found.
77-09-8	3,3'-Bis(4-hydroxy-phenyl)phthalid = Phenolphthaleine	**Phenolphthalein** is used as a laboratory reagent and acid-base indicator and in over-the-counter laxative preparations. Phenolphthalein is according to the ESIS database produced in amounts < 10 tones/year and thus not a LPV substance. For the EUSES calculations a production volume of 10 tones per year has been used. Phenolphthalein is not readily biodegradable and has potential to bioaccumulate (log Kow=3.06). Based on EUSES estimations Phenolphthalein is expected to be found in local surface water in relatively high concentrations (approx. 10 mg/L) as well as sediments and agricultural soils. Based on EUSES estimations for secondary poisoning and human intake Chlordimeform is expected to be found in fish, predators and human food in insignificant amounts. Based on the expected high concentrations in surface waters PCA is considered as being of **Medium Concern.** None specifically regulatory or legal status for this substance was found.

CASNR	NAME	Conclusion
77-40-7	2,2-Bis(4-hydroxyphenyl)-n-butan = Bisphenol B	**Bisphenol B** is component of Phenolic Resin which is thermosetting resin used as Adhesive and Reinforcement. Bisphenol B is used in many industrial applications. Bisphenol B is according to the ESIS database produced in low amount and is neither a HPV or LPV substance. For the EUSES calculations a production volume of 10 tones per year has been used. Bisphenol B is not readily biodegradable and has a high potential to bioaccumulate in the environment (log kow=4.69). Bisphenol B is in the environment mainly distributed to surface water as well as sediments and agricultural soils. Based on EUSES estimations for secondary poisoning Bisphenol B is expected to be found in fish and top predators in minor amount. A medium human exposure is expected. Bisphenol B is considered as being of **Medium Concern.** None specifically regulatory or legal status for this substance was found.
92-69-3	4-Hydroxybiphenyl = 4-Phenylphenol	**4-Phenylphenol** in an industrial intermediate. 4-Phenylphenol is according to the ESIS database a LPV substance. For the EUSES calculations a production volume of 1000 tones per year has been used. 4-Phenylphenol is not readily biodegradable and has potential to bioaccumulate in the environment (log kow=3.2). 4-Phenylphenol is in the environment mainly distributed to surface water in concentrations up to approx. 4 mg/L. Based on EUSES estimations for secondary poisoning and human intake 4-Phenylphenol is expected to be found in fish, predators and human food in minor amounts. 4-Phenylphenol is considered as being of **Medium Concern.** None specifically regulatory or legal status for this substance was found.
92-88-6	4,4'-Dihydroxybiphenyl = 4,4'-Biphenol	**4,4'-Biphenol** used as sunscreens, preservatives, disinfectants, antioxidants, flavorings, or for perfumery. 4,4'-Biphenol is according to the ESIS database produced in amounts < 10 tones/year and is thus not a LPV substance. For the EUSES calculations a production volume of 10 tones per year has been used. 4,4'-Biphenol is not readily biodegradable and has a medium potential to bioaccumulate in the environment (log kow=2.8). 4,4'-Biphenol is in the environment mainly distributed to surface water in concentrations up to approx. 1 mg/L. Based on EUSES estimations for secondary poisoning and human intake 4,4'-Biphenol is expected to be found in fish, predators and human food in insignificant amounts, however, a high human exposure is expected due to the defined use of the substance. 4,4'-Biphenol is considered as being of **High Concern.** None specifically regulatory or legal status for this substance was found.
94-13-3	n-propyl p-hydroxybenzoate	**N-propyl p-hydroxybenzoate** is used as a preservative in food, pharmaceutical and cosmetic formulations. N-propyl p-hydroxybenzoate is produced in amounts up to 10 tones per year and thus a LPV substance. N-propyl p-hydroxybenzoate is readily biodegradable and has potential for bioaccumulation (log Kow=3.04). Based EUSES calculations N-propyl p-hydroxybenzoate is in the environment mainly distributed to surface waters in concentrations up to approx. 10 mg/L. N-propyl p-hydroxybenzoate is expected to be found in fish, predators and human food in insignificant amounts. However, as n-propyl p-hydroxybenzoate is used as a preservative in food and cosmetics a high human exposure is expected. N-propyl p-hydroxybenzoate is thus considered as being of **Medium Concern.** None specifically regulatory or legal status for this substance was found. It is the opinium of the Scientific Commitee on Consumer Products (SCCP) that, viewing the current knowledge, there is no evidence of demonstrable risk for the development of breast cancer caused by the use of underarm cosmetics including parabens

CASNR	NAME	Conclusion
94-26-8	n-Butyl p-Hydroxybenzoate	**n-Butyl p-Hydroxybenzoate** is used as a preservative in food, pharmaceutical and cosmetic formulations. N-Butyl p-hydroxybenzoate is according to the ESIS database produced in amounts < 10 tones/year and is thus not a LPV substance. For the EUSES calculations a production volume of 10 tones per year has been used. N-Butyl p-hydroxybenzoate is readily biodegradable and has a relatively high potential for bioaccumulation (log Kow=3.57). Based EUSES calculations N-Butyl p-hydroxybenzoate is in the environment mainly distributed to surface waters in concentrations up to approx. 1 mg/L. N-Butyl p-hydroxybenzoate is expected to be found in fish, predators and human food in insignificant amounts. However, as n-Butyl p-hydroxybenzoate is used as a preservative in food and cosmetics a high direct human exposure is expected. N-Butyl p-hydroxybenzoate is thus considered as being of **Medium Concern.** None specifically regulatory or legal status for this substance was found. It is the opinium of the Scientific Commitee on Consumer Products (SCCP) that, viewing the current knowledge, there is no evidence of demonstrable risk for the development of breast cancer caused by the use of underarm cosmetics including parabens
96-12-8	Dibromochloropropane (DBCP)	**Dibromochloropropane (DBCP)** is used as a pesticide as well as an industrial intermediate. DBCP is according to the ESIS database produced in amounts < 10 tones/year and is thus not a LPV substance. For the EUSES calculations a production volume of 10 tones per year has been used. DBCP is not readily biodegradable and has medium potential to bioaccumulate in the environment (log kow=2.96). DBCP is in the environment mainly distributed to surface water in concentrations up to approx. 1 mg/L. Based on EUSES estimations for secondary poisoning and human intake DBCP is expected to be found in fish, predators and human food in minor amounts. DBCP is considered as being of **Medium Concern.** Covered by Council Directive 91/414/EEC. No RAR has been provided and the substance is not included in the list for pesticides to be reviewed. Classification: CARC2;R45 MUT2;R46 REP1;R60 T;R25 XN;R48/20/22 R52/53
99-76-3	Methyl p-Hydroxybenzoate	**Methyl p-Hydroxybenzoate** is used as a preservative in food, pharmaceutical and cosmetic formulations. Methyl p-Hydroxybenzoate is according to the ESIS database a LPV substance. For the EUSES calculations a production volume of 500 tones per year has been used. Methyl p-hydroxybenzoate is readily biodegradable and has a low potential for bioaccumulation (log Kow=1.96). Based EUSES calculations Methyl p-hydroxybenzoate is in the environment mainly distributed to surface water in concentrations up to approx. 1 mg/L. Methyl p-hydroxybenzoate is expected to be found in fish, predators and human food in insignificant amounts. However, as Methyl p-hydroxybenzoate is used as a preservative in food and cosmetics a high direct human exposure is expected. Methyl p-hydroxybenzoate is thus considered as being of **Medium Concern.** None specifically regulatory or legal status for this substance was found. It is the opinium of the Scientific Commitee on Consumer Products (SCCP) that, viewing the current knowledge, there is no evidence of demonstrable risk for the development of breast cancer caused by the use of underarm cosmetics including parabens

CASNR	NAME	Conclusion
99-96-7	p-Hydroxybenzoic acid	**p-Hydroxybenzoic acid** is the common metabolite of all parabens and thus used as a preservative in food, pharmaceutical and cosmetic formulations. p-Hydroxybenzoate is according to the ESIS database a LPV substance. For the EUSES calculations a production volume of 1000 tonnes per year has been used. P-hydroxybenzoic acid is readily biodegradable and has a low potential for bioaccumulation (log Kow=1.58). Based EUSES calculations p-Hydroxybenzoic acid is distributed to the environment at low concentrations. P-hydroxybenzoic acid is expected to be found in fish, predators and human food in insignificant amounts. However, as P-hydroxybenzoic acid is used as a preservative in food and cosmetics a high direct human exposure is expected. P-hydroxybenzoic acid is thus considered as being of **Medium Concern.** None specifically regulatory or legal status for this substance was found. It is the opinium of the Scientific Commitee on Consumer Products (SCCP) that, viewing the current knowledge, there is no evidence of demonstrable risk for the development of breast cancer caused by the use of underarm cosmetics including parabens
96-45-7	Ethylene Thiourea (ETU)	**Ethylenethiourea (ETU)** is one of the degradation products of ethylenebis-dithiocarbamate fungicides, such as maneb and zineb, which have been widely used on food crops. ETU is according to the ESIS database a LPV substance. For the EUSES calculations a production volume of 1000 tones per year has been used. ETU is not readily biodegradable and has a low potential for bioaccumulation (log Kow=-0.66). Based EUSES calculations ETU is in the environment mainly distributed to surface water in concentrations up to approx. 0.5 mg/L. ETU is expected to be found in fish, predators and human food in insignificant amounts. ETU is thus considered as being of **Low Concern.** The substance is covered by Council Directive 91/414/EEC. No RAR has been provided and the substance is not included in the list for pesticides to be reviewed. Classification: REP2;R61 XN;R22

3 INTRODUCTION

3.1 Background

In both human beings and animals, endocrine disruption is a mechanism whose effects relate to the functioning of the endocrine system, which influences development, growth, reproduction and behaviour. According to accepted Weybridge definition (EU 1997) as supported by the Commission (COM(1999) 706), an endocrine disrupter is an exogenous substance or mixture that alters function(s) of the endocrine system and consequently causes adverse health effects in an intact organism, or its progeny, or (sub)populations. In recent years, there has been growing concern over a range of substances, which are suspected to interfere with the endocrine system, the so-called endocrine disrupters. Endocrine disrupters may act by the following mechanisms:

- Direct damage to an endocrine organ
- Direct altering of the function of an endocrine organ
- Interaction with receptors
- Altering the hormone metabolism, either in endocrine organs or peripherally

The observed adverse effects of endocrine disrupters in humans and animals include cancer, behavioural changes and reproductive abnormalities. However, the knowledge of endocrine disrupters and their effects is still characterised by many uncertainties and data gaps.

In 1996, the European Commission implemented a policy as to the use and regulation of suspected endocrine disturbing substances, and, in December 1999, it adopted a Community Strategy for Endocrine Disrupters. This strategy addresses the key elements of further research, international co-operation, public communication and appropriate policy actions.

The strategy contains actions on short-, medium- and long-term time scales. Short-term actions include gathering of scientific data, identification of substances for further evaluation with a view to prioritising testing, guidance of research and monitoring of efforts and to identifying exposure target groups. Medium-term actions focus on testing issues. Long-term actions include review and possible adaptation of policy and legislation.

A key short-term action is the establishment of a priority list of substances for further evaluation of their role in endocrine disruption. The first study carried out in 2000 on the behalf of the Commission (BKH 2000) identified a candidate list of 553 substances.

Among these substances, 59 substances were identified as mixtures and/or polymers, and/or double inputs and/or group names and will not be evaluated further, while 118 were identified as High Production Volume substances and/or persistent man-made chemicals showing scientific evidence of endocrine disruption or potential for endocrine disruption. Most of these substances (109) were already subject to bans or restrictions or were being addressed under existing Community legislation although for reasons not

necessarily related to endocrine disruption. In the short term, priority was thus given to nine substances, which are neither restricted nor currently being addressed under existing Community legislation, and for which more in depth studies were necessary. In addition, three natural and/or synthetic hormones, oestrone, ethinylestradiol and oestradiol were evaluated in order to gather up-to-date evidence of environmental exposure and effects related to these substances. These substances were studied by WRc and reported in: "Study on the scientific evaluation of 12 substances in the context of Endocrine Disrupter priority list of actions". WRc-NSF published November 2002.

A second study was performed in 2002 (RPS-BKH, 2002), in which the remaining 435 substances in the 2000 report, for which there had been insufficient data to assess endocrine disruption or potential for endocrine disruption, were evaluated. The aim of this study was to gather data/information on persistence, production volumes and legal status of these substances. The study primarily focused on industrial chemicals used in industry, agriculture and consumer goods. The substances were categorised according to different levels of available information for the following four selection criteria:

- Production volume
- Persistence in the environment
- Evidence for endocrine disruption from literature data
- Exposure considerations

Among the 553 substances of the original candidate list, 173 substances had not been evaluated for endocrine or potential endocrine effects on humans and wildlife.

In the IUCLID database, 7829 chemicals are registered as Low Production Volume Chemicals (LPVC) but no information regarding their potential endocrine disrupting effects is registered. It was agreed that the present evaluation should include possible identification of additional substances among these, which may have endocrine disrupting properties. For this purpose, stakeholders were consulted. The endocrine properties of 173 substances plus 22 substances identified by stakeholders were thus evaluated in the present study.

Throughout the present report, the definitions of 'Low Production Volume Chemicals' and 'High Production Volume Chemicals' are based on the definitions given in ESIS (European chemical substances information system):

HPVC (High Production Volume Chemical). A HPVC is a chemical which is defined as being produced or imported in quantity of at least 1000 tonnes per year in EU by at least one Industry.

LPVC (Low Production Volume Chemical). A LPVC, is a chemical which has been produced or imported in EU with a tonnage >10 t/y but never more than 1000 t/y. By definition, a LPV Chemical is a chemical which is not a HPV Chemical.

3.2 Objectives and scope of the current project

The main objective with the present project was to improve the database developed in the RPS-BKH 2002 project and to include collected data on endocrine disrupting properties of the remaining substances placed on the candidate list.

The subject of this project belongs to the short-term priority actions of the European Commission. It entails a study to gather data and information on LPVC as well as on substances with a production volume < 10 tonnes/year and to enhance the Endocrine Disrupter priority list with a view to providing information on the priority list at the DG Environment Endocrine Disrupters Website and inform relevant EU policy areas.

According to the Community Strategy for Endocrine Disrupters (1999), the present study is a short-term key action and a follow-up on the EC DG-ENV study (2002) "Towards the establishment of a priority list of substances for further evaluation of their role in endocrine disruption – preparation of a candidate list of substances as a basis for priority setting".

The present study "Study on enhancing the Endocrine Disrupter priority list with a focus on low production volume chemicals" is a follow-up study for the establishment of a priority list of substances for further in-depth evaluation of their role in endocrine disruption. Two previous studies in this area were carried out by BKH in 2000 and by RPS BKH in 2002. The present study is thus the last of three evaluations going through the remaining candidate substances (173 substances) from the EU candidate list including 553 substances in total. For comparability reasons and as the present study is the last of three evaluations of the candidate substances, the same methodology as used in the previous RPS-BKH 2002 project was applied.

The compilation of the priority list is based on a screening of available literature and should therefore be regarded as a starting point for further hazard and risk assessments of the substances placed on the priority list. The evaluations shall be seen in line with the previous studies (BKH 2000 and RPS-BKH 2002) and shall NOT be seen as risk assessments. Future in-depth evaluations of the substances placed on the list need to be performed and a methodology must be developed to make the list iterative meaning that a substance can enter or be deleted from the list based on a weight of evidence approach.

The present evaluation included:

1. A written consultation with stakeholders, which, as far as possible, ensured that possible new candidates for the Endocrine Disrupter candidate list were identified among substances listed in the ESIS database
2. The identified substances were evaluated for endocrine disrupting effects and the following screening criteria have as far as possible been taken into account:

    - Relevance of effect parameter
    - Test reliability
    - Dose-response relationship
    - Endocrine disruption potency
    - Comparison with systemic toxicity
    - Evaluation of exposure concern to humans and wildlife
    - Consumption/use patterns
    - Environmental concentration ranges

In order to reach the objectives, the following four tasks were formulated:

- Identification of relevant stakeholders
- Identification of new candidate LPVC for further evaluation of their endocrine disrupting properties
- Collection and evaluation of data/information on LPVC to establish priorities for further evaluation of their role in endocrine disruption
- Update of database, list and meetings

Below, the methodology used to fulfil the tasks is described.

3.3 Study approach

Below, the four tasks identified to fulfil the study objectives are described.

Task 1 Identification of relevant stakeholders
- Relevant stakeholders were identified in consultation with the Commission
- The same stakeholders were used as a written consultation group based on a web-based response

Task 2 Identification of new candidate LPVC for further evaluation of their endocrine disrupting properties
- The substances were identified by a written consultation with the stakeholders identified in Task 1.

Task 3 Collection and evaluation of data/information on LPVC to establish priorities for further evaluation of their role in endocrine disruption

The execution of this task was based on the following activities:
- Data search strategy, data collection and data evaluation
- Evaluation of exposure of humans and wildlife

Task 4 Update of database, list and meetings
- The major objective of this task was to report the study in a way that enables the Commission to make the results available at the Commission's Endocrine Disrupters Website.
- The progress of the study was placed at the web site: (http://projects.dhi.dk/Endocrine_Disrupter/testsite/) together with the existing version of the database. A link to the DHI homepage was placed at the ECB homepage on endocrine disrupters (http://ec.europa.eu/environment/endocrine/strategy/substances_en.htmon) allowing third party to follow the progress in the project as well as providing comments on the draft final report and the final outcome of the database.
- In order to ensure close co-operation with the Commission, four meetings took place during the project period

4 METHODOLOGY

4.1 Identification of relevant stakeholders (Task 1)

The main objective of this task was to identify relevant contacts among stakeholders. Relevant stakeholders were contacted in the written consultation described under Task 2.

Task 1.1 Identification of stakeholders for written consultation
Relevant stakeholders were identified in consultation with the Commission taking a starting point in the following groups:

- National focal points in EU Member States
- ECETOC
- Experts involved in international work regarding endocrine disrupters, e.g. OECD Validation Management Groups for Ecotoxicity Tests (VMG-eco) and Mammalian toxicity test (VMG-mammal) of the Task Force on Endocrine Disrupters Testing and Assessment (EDTA)
- Members of the EU projects on endocrine disrupters e.g., CREDO, EDEN, FIRE
- Environmental NGOs
- Industrial branch organisations, e.g. CEFIC, EUROCHLOR and individual industries,

Task 1.2 Identification of stakeholders for consultation group
At the interim report meeting (29 June 2006) between DHI and DG ENV, it was decided that all contacted stakeholders were invited to go through the draft final report and the collected data on substances categorised as Category 1 substances (evidence for endocrine disrupting effects) in the database. Due to cost limitations, it was decided not to have a physical meeting but instead have web-based stakeholder responses.

4.2 Identification of new candidate LPVC for further evaluation of their endocrine disrupting properties (Task 2)

The major objective of this task was to identify substances (preferably LPVC) with a potential for endocrine disruption, which have not been included in previous lists.

The substances were identified by a written consultation with the stakeholders identified in Task 1.1. The request included a brief presentation of the background for the query with reference to the existing lists of potentially endocrine disrupting substances. Furthermore, a short questionnaire included questions regarding the knowledge of endocrine disrupting properties of other chemicals, references regarding this knowledge and possible information relevant to exposure assessment, e.g. regarding production volumes and use of the chemicals.

4.3 Collection and evaluation of data/information on LPVC to establish priorities for further evaluation of their role in endocrine disruption (Task 3)

The major objective of this task was to gather data/information on LPVC specifically on their potential role in endocrine disruption.

The study was based on the the remaining of the 553 substances placed on the candidate substance list, which were identified in the BKH Report of 2000, and on new candidate substances, which were identified in Task 2 as described above.

Starting points were the methodology developed in the RPS-BKH report (2002) and the database containing the candidate substances identified in the BKH report of 2000, with data from background documents. The methodological approaches and evaluation of the selected substances with respect to endocrine disrupter potency towards humans and wildlife were elaborated by the project team and included the subtasks described below.

4.3.1 Data search strategy and data collection (Task 3.1)

Literature was searched in different databases both free databases available on the internet and licensed databases purchased by DHI.

For all substances, a general screening of the literature was performed. The following databases were searched (for the specific CAS number or name):

- HSDB (Hazardous Substances Data Bank)
- RTECS via Thomes (Thomson, Micromedex)

The following databases were searched for original peer-review scientific papers:

- TOXCENTER (Toxicology Center) is a bibliographic database that covers the pharmacological, biochemical, physiological and toxicological effects of drugs and other chemicals.

  TOXCENTER is composed of the following file segments:

  - ANEUPL - Aneuploidy File
  - BIOSIS - 1969 to the present
  - CAplus - 1907 to the present
  - CIS - CIS Abstracts
  - CRISP - Toxicology Research Projects
  - DART - Development and Reproductive Toxicology File
  - EMIC - Environmental Mutagen Information Center File
  - EPIDEM - Epidemiology Information System,
  - ETIC - Environmental Teratology Information Center File
  - FEDRIP - Federal Research in Progress
  - HAPAB - Health Aspects of Pesticides Abstract Bulletin
  - HMTC - Hazardous Materials Technical Center File
  - IPA - 1970 to the present
  - MEDLINE - 1950 to the present

- PESTAB - Pesticides Abstracts
- PPBIB - Poisonous Plants Bibliography
- RISKLINE - Swedish National Chemicals Inspecorate
- TSCATS - Toxic Substances Control Act Test Submissions

The records in the file contain bibliographic data, abstracts, indexing terms, chemical names and CAS Registry Numbers.

- EMBASE (Excerpta Medica) is a comprehensive bibliographic database that covers the worldwide literature on biomedical and pharmaceutical fields. It is produced by Elsevier B.V., the world's largest publisher of scientific information.

- Science Citation Index (SciSearch®) contains all records published in Science Citation Index ExpandedTM. Records from January 1991 up to the present. It includes abstracts, author keywords, and KeyWords Plus®. Authors, bibliographic information cited references and KeyWords Plus are searchable.

The search strategy for the substances was:

- Search on CAS No., chemical name and synonyms
- The hits identified searching on CAS No. and names were combined with the following search terms:

For substances with many hits, the following search terms were used:

testes, undescended OR testis, undescended OR testic? feminization OR androgen insensitivity OR oestrus OR estrus OR cryptorchidism OR hypospadias OR uterotrophic OR Hershberger OR gonadal disorder# OR gonadal dysgenesis OR gonadal agenesis OR gonad? Inhibiting hormone# OR estrogen? receptor# OR oestrogen? receptor# OR estrogen? Effect# OR oestrogen? effect# OR anti-androgen? effect# OR androgen? receptor# OR vitellogen? OR 11-ketotestosterone OR progesterone# receptor# OR testosterone# receptor# OR endocrine disrupt? OR thyroid? hormone#

For substances with few hits, the following search terms were used:

testes OR testis OR testic? OR androgen? OR oestrus OR estrus OR cryptorchidism OR hypospadias OR uterotrophic OR Hershberger OR preputial OR vagina? OR sperm? OR gonad? OR estrogen? OR oestrogen? OR anti-androgen? OR vitellogen? OR 11-ketotestosterone OR pituitary OR progesterone# OR testosterone# OR endocrine disrupt? OR thyroid?

If more than approx. 100-150 hits were identified by either of these search strategies, a further limitation was performed. In few cases, the exclusion of *in-vitro* studies was used as a limitation criterion but this only resulted in a small limitation of hits. Limitation on year of publication was mostly used by starting with excluding literature published before 1980 and then excluding literature with 5-10 years intervals until approx. 100 hits were reached.

The identified hits were screened for relevant/valuable titles. For selected titles, abstracts were downloaded. Due to cost limitations (the database search and downloading of abstracts turned out to be very costly), evaluations were mainly based on the downloaded abstracts.

4.3.2 Evaluation of endocrine potential (Task 3.2)

The evaluation of endocrine disrupting-related effects on humans and wildlife has resulted in categorisation of the substances based on the following screening criteria:

- Relevance of test parameter (with aspects such as endocrine specific effects in contrast to general toxicity (teratogenic effects))
- Test reliability (validated protocols; experimental design; suitability, health and life stage of test species; statistics). Ranked indication of Data Quality (DQ 1-4). DQ: Good Data Quality, fulfilling all (important) criteria; DQ2: Sufficient Data Quality, study fulfilling most of the (important) criteria; DQ3: Insufficient Data Quality, study cannot be used for identification; and DQ4: Not evaluated .
- Dose-response relationship or indications of effect thresholds
- Endocrine disruption potency (including a categorisation of the chemicals into three groups: 1. Evidence for endocrine disrupting (ED) effect; 2. Potential ED effect; 3. No evidence for ED effect)
- Endocrine disruption structure-activity relationship
- Comparison with systemic toxicity (Standard toxicity data –NOECs/LOECs, E(E)C50s, NOALs/LOAELs from RTECS, ECOTOX (AQUIRE), DOSE and Vershuren databases)

Based on the above screening, the substances have been divided into the following four Categories:

CAT 1	At least one *in-vivo* study providing clear evidence for endocrine disruption in an intact organism. Not a formal weight of evidence approach.
CAT 2	Potential for endocrine disruption. *In-vitro* data indicating potential for endocrine disruption in intact organisms. May also include *in-vivo* effects, however, then with insufficient convincing character.
CAT 3a	No scientific basis for inclusion in list (ED studies available but no indications of ED effects)
CAT 3b.	Substances with no or insufficient data gathered.

4.3.3 Evaluation of exposure of humans and wildlife (Task 3.3)

For substances categorised as CAT 1 and CAT 2, evaluation of exposure of humans and wildlife have been based on the following methodology:

1. Data on production and import quantity (ECB, IUCLID database). Also consumption/use patterns have been obtained from the ECB, IUCLID database on existing substances manufactured or imported in quantities of more than 10 tonnes per year. For substances manufactured or imported in quantities less than 10 tonnes per year a

default value of 10 tonnes per year was used. The information includes quantity and use pattern (Main Category, Industrial Category) data.
2. Environmental concentration ranges (COMMPS, European Environment Agency (EEA)).
3. Evaluation of exposure of humans and environment by use of the PC program EUSES.

1) Data on production, import and use quantities (IUCLID)
Data concerning quantity of chemicals manufactured in or imported to the EU, and the use within the EU is based on information provided by the European Chemical Bureau (September 2004) as extracts of the IUCLID database. These data reflects the use reported to the ECB during the years 1999-2004. The IUCLID database contains information, which has been submitted by manufacturers and importers of existing chemicals in quantities exceeding 10 tonnes per year.

The following data were obtained for each entry:

- CAS numbers (several entries per CAS)
- DSN number coding for the registrant (one or more registrants per CAS)
- Quantities manufactured or imported per year (per entry)
- Industry Category (IC)
- Use Category (UC)
- Main Categories (MC)

The IUCLID extract contains separate entries defined by the substance CAS number, the registrant DSN and the year for which the quantity pertains. For example, if one substance is registered by 3 registrants and each of them registers the quantity for 3 years, there will be 9 separate entries for the CAS number.

Each registration dossier from a manufacturer or importer of a chemical contains the total quantity of the chemical produced or imported per year. It also contains information on the Main Categories (MC) used to characterise the general release scenarios of the chemical as well as information on the more specific Industrial Categories (IC) and Use Categories (UC) describing the production and use of the chemical in more detail.

Chemicals may have different use within different industries according to different products and processes. In agreement to this, one chemical may have several codes for Industrial Categories and Use Categories (UC). In our case, EUSES calculation is based on maximum quantities manufactured or imported per year by one or several manufacturer and the most likely use pattern.

2) Environmental concentration ranges (COMMPS)
Environmental concentration ranges for CAT 1 and CAT 2 substances were searched in COMMPS database/EEA. COMMPS includes water and sediment monitoring data from all EEC Member States.

3) EUSES
The PC program EUSES is designed to be a decision-support system for the evaluation of the exposure of chemicals to man and the environment. The system is fully described in the EUSES documentation (http://ecb.jrc.it/euses/) and is based on the EU Technical

Guidance Documents (TGDs; EC-TGD, 2003) for risk assessment of new and existing substances and biocides. Input to the EUSES calculations are data on volume produced, imported or used, the use pattern and physico-chemical properties of the chemical concerned.

The EUSES summary reports include among other things information concerning:

- Volume produced, imported or used in EU (IUCLID, ECB data (1999-2004)
- Codes for use pattern (IUCLID, ECB data)
- Physico-chemical properties of the substance (complied and evaluated data)
- Release to environment on local, regional and continental scale
- Concentration in water, soil, sediment on local scale (highest concentration)
- Concentration in water and sediment local, regional and continental
- Concentration in fish for secondary poisoning (fresh water)
- Concentration in top predators
- Concentration in earthworms from agricultural soil
- Human daily intake doses due the environment on local and regional scale

4.3.3.1 Using EUSES

For many chemicals, information on actual exposure doses or concentrations is limited or even absent and concentrations generally vary significantly in time and space. Therefore, doses and environmental concentrations of a chemical are predicted in a two-step procedure:

- First, releases to environmental compartments or the indoor environment are predicted on the basis of the volume produced, imported or used, the use pattern and physico-chemical properties of the chemical concerned.
- Next, environmental concentrations and human daily intake doses are calculated using models, which take into account the transport and fate of the substance.

The main structure of EUSES is presented in Figure 4.1. In the present project, only the release estimation, the environmental distribution and the exposure assessment are included. If effect data are entered EUSES also gives the possibility to calculate the environmental risk, risk for human health as well as calculations of exposure via working places. These calculations are not included in the present evaluations.

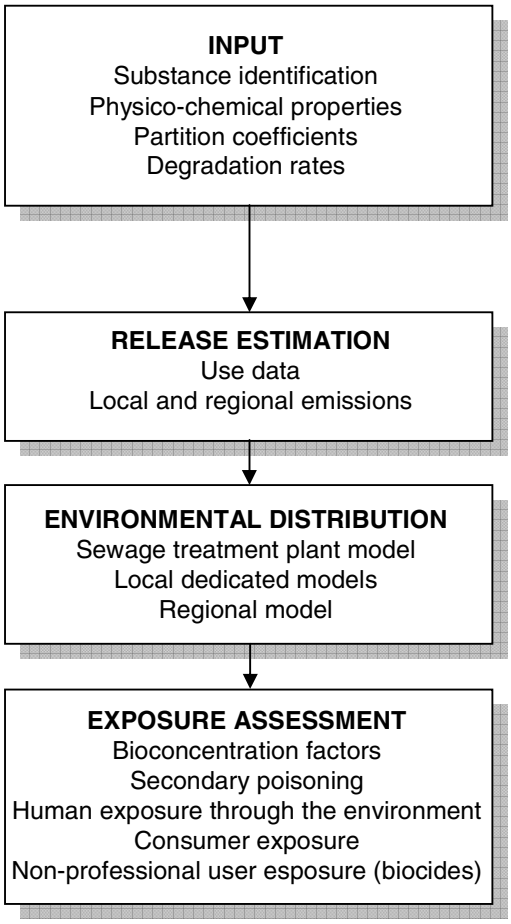

Figure 4.1 The main modules of EUSES

INPUT
The following physico-chemical input data are needed:

- Melting point (Mp)
- Boiling point (Bp)
- Vapour pressure (Psat)
- Henry's Law constant (KH)
- Water solubility (Ws)
- Octanol-water partition coeffients (K_{ow})
- Organic carbon-water partition coefficient (K_{oc})
- Bioconcentration factor (BCF)
- Abiotic degradation (OH radical oxidation) in air (t½(air))
- Abiotic degradation in surface waters by hydrolysis (t½(hydro))
- Biodegradation – ready/inherent biodegradability

The input data were compiled from the following free data sources:

- IUCLID
- RAR (ORATS)

- CHRIP NITE Biodegradation and bio-concentration
- SYRACUSE-CHEMFATE
- MST-database
- EPI-Suite

IUCLID
The International Uniform ChemicaL Information Database (IUCLID database) contains various measured and estimated physico-chemical parameters and fate properties on 2,465 high production volume chemicals reported by European Industry in the frame of the European existing chemicals risk assessment programme.

RAR (ORATS)
Provides on-line access to the 141 complete and draft European risk assessment reports (RARs). The reports contain evaluated risk assessment data.

Chemical Risk Information Platform (CHRIP) - CHRIP NITE Biodegradation and Bioconcentration Formerly Biodegradation and Bio Accumulation of Existing Chemicals (Chemical Evaluation and Research Institute, Japan)
The database on Biodegradation and Bioconcentration of the Existing Chemical Substances under the Chemical Substances Control Law (Japan) contains information on biodegradation and bioconcentration of existing chemical substances and on their testing conditions (i.e. measured data), which have been published in the Official Bulletin of Economy, Trade and Industry. The Biodegradation and Bioconcentration of the Existing Chemical Substances under the Chemical Substances Control Law system contains data on 1,294 chemical compounds.

Syracuse-Chemfate
The Syracuse Chemfate contains 25 categories of measured environmental fate and physico-chemical property information on 1,728 chemical compounds. All in all, Chemfate contains 17,260 records.

MST-database (not public available)
This database has been developed by the QSAR team of the Danish Environmental Protection Agency (DEPA). It contains QSAR estimates on various physico-chemical, fate and ecotoxicological endpoints on 45,453 EINECs chemicals. The physico-chemical data and fate parameters have been estimated by application of EPI-Suite (see below). The database is not an online facility but a stand-alone database.

EPI-Suite -The EPI SuiteTM (previously EPIWIN)
This database has been developed by the USEPA Office of Pollution Prevention Toxics and the Syracuse Research Corporation (SRC). EPI SuiteTM uses a single input such as structure (i.e. SMILES notation), CAS No. or name to run the following physico-chemical and fate property estimation models: KOWWINTM, HENRYWINTM, MPBPWINTM, WSKOWWINTM and STPWINTM. The EPI Suite also contains the Syracuse PhysProp database, which includes measured physico-chemical properties on 25,000 chemical compounds.

Prioritization and selection of data

In the present project all compiled data were evaluated in relation to their quality according to the approach shown in Figure 4.2 and assigned a quality index(QI) between 1 (low quality) and 4 (high quality).

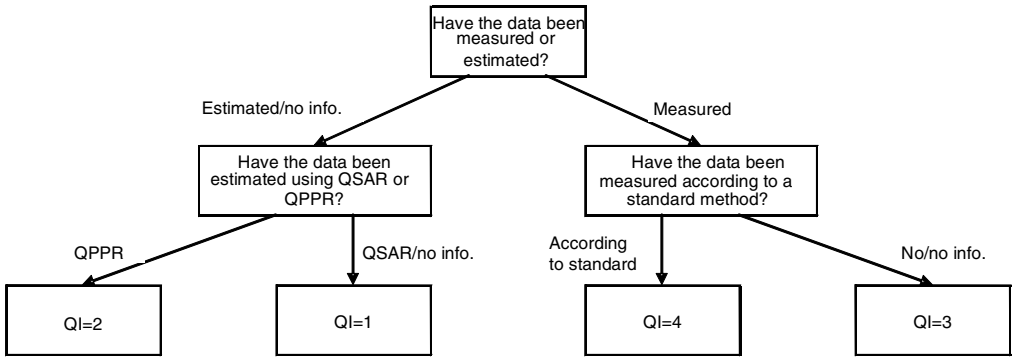

Figure 4.2 General data prioritization approach

The data are assigned a quality index primarily based on origin (estimation/measurement) and secondly on a general uncertainty assessment. For the measured data, the uncertainty is estimated from the method of measurement (standard/non-standard measurement) and for the estimated data, the uncertainty is estimated from the estimation algorithm input (property/structure). (QI= Quality Index, QSAR = Quantitative Structure-Activity Relationship, QPPR= Quantitative Property-Property Relationship, info.=information).

It is, however, clear that in some cases only data having the same quality index (for instance only QSAR data) are available for a given property of a specific chemical compound. In such cases, it is necessary to perform an expert assessment of the data origin and evaluate the credibility and uncertainty of the data origin.

Complementary to the quality index data, the credibility of the database/sources was used in the selection procedures of data. Databases and data sources were ranked according to credibility.

Table 4.1 Credibility of database/data sources. Values from 1-6 indicate credibility from high to low.

1	IUCLID
2	RAR (ORATS)
3	CHRIP NITE Biodegradation and bio-concentration
4	SYRACUSE-CHEMFATE
5	MST-database
6	EPI-Suite

Data for the EUSES evaluation of the exposure of chemicals to man and the environment were selected by use of the following procedure:

- Data with the highest QI is selected.
- If the QI values are equal, firstly, data obtained at 25ºC and neutral pH 7 and, secondly, data from database/sources with the highest credibility are selected.
- Possible comments attached to the data may affect the selection of data

The following general criteria were applied in selection of data:

- Tests conducted at > 25-30ºC are not included
- Only boiling points obtained at ≈ 1013 hPa are included
- Biodegradation: Only tests performed under aerobic conditions are included and where many data are available, primarily OECD 301 tests are considered
- IUCLID database: Where method is described as "other", the origin is assumed to be EXP (experimental). A note about the origin is made in "Comments"
- EPISUITE database: Biodegradation from this reference is evaluated on the basis of data from EPISUITE algorithms

RELEASE ESTIMATION

Based on the known properties, uses and functions of a substance, emission factors for various life-cycle stages are chosen from a database with default values. Daily emission rates are subsequently calculated using either again default values or specific emission models.

EUSES operates with 16 different Industry Categories (IC) and 56 different Use Categories (UC) with reference to use pattern. The different categories determine the magnitude and pattern of release, distribution and exposure to humans and the environment.

For every use pattern, the emission input data must be specified, consisting of Industrial Category, Use Category and (if appropriate) extra details on Use Category, and the fraction of tonnage for each application. Furthermore, it needs to be indicated here which stages of the life cycle are relevant for the current use pattern in the assessment. If relevant for the following stages of the life cycle, i.e. production, formulation and processing, the Main Category may be specified (otherwise a default value is used).

Releases to the environment can take place at any stage of the life cycle of a chemical substance. The life cycle is split up in six stages:

1. Production is the stage in which the substance is manufactured, i.e. formed by chemical reaction(s), isolated, purified, drummed or bagged, etc.

2. Formulation is the stage in which chemicals are combined in a process of blending and mixing to obtain a product or a preparation.

3. Industrial use. The processing stage consists of all kinds of processes whereby the substance as such, as a formulation or as an article containing the substance assessed is applied or used. The substance may be used as a processing aid or be incorporated in a product.

4. Private use. This stage considers the use and application of substances (as such or in formulations) on the scale of households.

5. Service life. A substance might be released during the life span of an article in which it is present. Release may be caused by diffusion, leaching or abrasion

6. Waste treatment (disposal). At the stage of disposal, the substance (or the products containing the substance) is disposed of with waste or waste water. Waste water may be treated in a sewage treatment plant. Waste materials may be incinerated or dumped. At the stage of disposal, recovery to the environment may take place. For some Industrial Categories, recovery was considered.

ENVIRONMENTAL DISTRIBUTION
This module contains all the models necessary to estimate the distribution of a substance in the environment at the appropriate spatial scale. End-points are concentrations in the relevant environmental compartments (air, surface water, marine water, sediment, soil and groundwater).

EXPOSURE ASSESSMENT
Based on estimated environmental concentrations, this module calculates the exposure levels for predating birds and mammals (through fish and earthworms) and humans. For humans, exposure through the environment can be estimated as well as exposure through consumer products, including biocides, and exposure at the workplace.

4.4 Update of database and list (Task 4)

The major objective of this task was to report the study in a way that enables the Commission to make the results available at the Commission's Endocrine Disrupters Website.

The reporting included written reports and revision of the database and list of the substances categorized in the BKH 2000 and RPS-BKH 2002 reports, to include those categorized in the present study and make the information and list available in Access, Excel and PDF formats. Furthermore, a DHI homepage was prepared (http://projects.dhi.dk/Endocrine_Disrupter/testsite/). in which the work progress was presented together with the possibility get access to the existing version of the database. A link to the DHI homepage was placed on the ECB homepage (http://ec.europa.eu/environment/endocrine/strategy/substances_en.htmon) allowing third party to follow the progress in the project.

Meetings
In order to ensure close co-operation with the Commission, four meetings were planned with the following issues:

1. Kick-off meeting. 17 November 2005. Minutes from the meeting are presented in Appendix A
2. Discussion of list of substances to be evaluated. 15 March 2006. Minutes from the meeting are presented in Appendix B
3. Discussion of interim report. 29 June 2006. Minutes from the meeting are presented in Appendix C

4. Discussion of draft final deliverables, i.e. report, database and list. 8 December 2006. Minutes from the meeting are presented in Appendix D

5 RESULTS

5.1 Identification of relevant stakeholders (Task 1)

The questionnaire was sent to 160 potential stakeholders both by mail and by e-mail in December 2005. Two letters and 5 e-mails were returned with a message on delivery failure. Thus, in total, the request was sent to approx. 155 people and organisations.

Although the deadline for response was 1 February 2006, quite many did not respond before late February/early March. A total of 34 stakeholders responded to the questionnaire. This means that the answer percentage was approx. 22%, which is considered acceptable. Most of the responses received were kind replies that the questionnaire was received but that no further data could be provided (65%). However, among the replies, in which new information and data were provided, a total of 22 new substances has been suggested for addition to the list and thus to be evaluated in the present project.

Due to financial issues in connection with accommodations and travel expenses, it was decided at the interim report meeting (29 June 2006) not to have a physical meeting in connection with the draft final deliverables but instead have web-based responses from stakeholders to the draft final report and database. The stakeholders and experts contacted for written consultation were thus invited to go through the draft final report and the collected data on the selected CAT 1 substances evaluated in the present study. The list of stakeholders and experts contacted are presented in Appendix E. The group of stakeholders for consultation at meeting are indicated as shaded names in Appendix A.

5.2 Identification of new candidate LPVC for further evaluation of their endocrine disrupting properties (Task 2)

The questionnaire for identification of new candidate LPVC with potential endocrine disrupting effects is presented in Appendix F.

As the amount of information, which followed the suggested new substances, was quite diverse (from just a CAS No. to detailed information about the substances including attached references about EDC effects), it was decided to include all suggested chemicals in the present study and perform the evaluation on these as on the rest of the priority substances. The suggested substances to be added to the list are shown in Table 5.1.

Table 5.1 New candidate substances identified by stakeholders

556-67-2	Cyclotetrasiloxane	HPV
81-14-1	1-tert-Butyl-3,5-dimethyl-2,6-dinitro-4-acetylbenzene	LPV
1222-05-5	1,3,4,6,7,8-Hexahydro-4,6,6,7,8,8-hexamethylcyclopenta(g)-2-benzopyrane	HPV
13171-00-1	4-Acetyl-1,1-dimethyl-6-tert.-butylindane	LPV
5466-77-3	2-Ethyl-hexyl-4-methoxycinnamate	HPV
118-56-9	3,3,5-Trimethyl-cyclohexyl salicilate	LPV
21245-02-3	2-Ethyl-hexyl-4-dimethyl-aminobenzoate	LPV
36861-47-9	3-(4-Methylbenzylidene)camphor	LPV
131-57-7	2-Hydroxy-4-methoxy-benzophenone	LPV
99-96-7	p-Hydroxybenzoic acid	LPV
99-76-3	Methyl p-Hydroxybenzoate	LPV
120-47-8	Ethyl 4-hydroxybenzoate	LPV
94-13-3	n-Propyl p-hydroxybenzoate	LPV
15087-24-8	3-Benzylidene camphor (3-BC)	LPV
131-55-5	Benzophenone-2 (Bp-2), 2,2',4,4'-tetrahydroxybenzophenone	LPV
10043-35-3	Boric acid	HPV
1582-09-8	Trifluralin	HPV
100-02-7	4-Nitrophenol	HPV
106-44-5	4-Nitro-3-phenylphenol	HPV
33704-61-9	6,7-Dihydro-1,1,2,3,3-pentamethyl-4(5H)indanone	Neither LPV nor HPV
94-26-8	n-Butyl p-Hydroxybenzoate	Neither LPV nor HPV
2581-34-2	3-Methyl-4-nitrophenol	Neither LPV nor HPV

During a thorough evaluation of the candidate list to be evaluated in the present study (173 substances from the ordinary list + 22 new candidate substances) it was found that several substances were not included in the ECB-ESIS database and thus not considered as relevant for evaluation of their endocrine disrupting effects as they probaply are not in use any longer. It was also found that a few of the substances were HPVC and that the majority of the substances were neither HPVC nor LPVC. They are existing substances but produced or imported in amounts ≤10 tons per year.

Based on this information, it was decided that the present work should only include HPVC and LPVC plus existing substances registered in the ECB-ESIS database although they were produced or imported in amounts ≤10 tons per year. Based on a close evaluation of the candidate substances list including the 22 new substances added by the written stakeholders (195 substances), the substances were divided into the following subgroups:

1. Current LPVC (26 substances) and HPVC (10 substances) according to ECB-ESIS
2. Substances found on ECB-ESIS list but neither LPVC nor HPVC (production volume < 10 ton/year) (73 substances)
3. Substances not found on ECB-ESIS list and therefore excluded from the evaluation (73 substances)
4. Substances with no CAS number and therefore excluded from the evaluation (15 substances)

For substances in Categories 3 and 4, it was decided to contact CEFIC to ask if they had any knowledge whether the substances are still produced and if yes in which amounts.

The request to CEFIC is presented in Appendix G. No answer from CEFIC was obtained on either this specific request or the request for identification of new candidate substances. No cooperation with the industry, e.g. identification of new ED substances, availability of ED data on substances placed on the candidate list or information about substances without CAS numbers, was thus obtained.

The revised list of priority substances is presented in Appendix I.

5.3 Collection and evaluation of data/information on LPVC to establish priorities for further evaluation of their role in endocrine disruption (Task 3)

5.3.1 Evaluation of endocrine potential (Task 3.2)

The tender from the Commission and the proposal submitted by DHI clearly stated the data evaluation to be performed was given. I.e., "Starting points are the methodology used in the RPS-BKH report (2002) and the database including the candidate substances which were identified in the BKH report of 2000, with data from background documents. The methodological approaches and evaluation of the selected substances with respect to endocrine disrupter potency towards humans and wildlife will be elaborated by the project team."

The evaluation of endocrine disrupting potential was based on the following screening criteria:

1. *Relevance of test parameter (with aspects such as endocrine specific effects in contrast to general toxicity (teratogenic effects))*
2. *Test reliability (validated protocols; experimental design; suitability, health and life stage of test species; statistics. Ranked indication of Data Quality (DQ 1-4). DQ: Good Data Quality, fulfilling all (important) criteria; DQ2: Sufficient Data Quality, study fulfilling most of the (important) criteria; DQ3: Insufficient Data Quality, study cannot be used for identification; and DQ4: Not evaluated*
3. *Dose-response relationship or indications of effect thresholds*
4. *Endocrine disruption potency (including a categorization of the chemicals into three groups: 1. Evidence for endocrine disrupting (ED) effect; 2. Potential ED effect; 3. No evidence for ED effect)*
5. *Comparison with systemic toxicity (Standard toxicity data – NOECs/LOECs, E(L)C50s, NOALs/LOAELs from RTECS and HSDB.*

As indicated in Section 4.3.1, literature was searched in different databases to obtain information on endocrine disruption effects and systemic toxicity. Additionally, information was provided by stakeholders on 22 substances. All information from these sources was evaluated and incorporated in the EDS database. A thorough literature search was thus performed but mainly the abstracts were evaluated. In cases, in which the information obtained from the abstracts was not sufficient for categorisation of the individual substance, a primary reference check was performed (the original article was purchased). In the database, the abstracts are found in the remark field. The abstracts were evaluated according to the screening criteria described and an evaluated extract of the effects obtained are reflected in the 'effect field'.

As the outcome from the present study shall be comparable to the outcome from the 2002 work and end up with a priority list of CAT 1 candidates the same methodology as the one one developed in the previous work performed by RPS-BKH 2002 was used.

The categorisation of the substances was performed according to the following evaluation criteria:

CAT 1	At least one *in-vivo* study providing clear evidence for endocrine disruption in an intact organism.
CAT 2	Potential for endocrine disruption. *In-vitro* data indicating potential for endocrine disruption in intact organisms. Also includes effects *in-vivo* that may, or may not, be ED-mediated.
CAT 3a	No scientific basis for inclusion in list (ED studies available but no indications of ED effects)
CAT 3b	Substances with no or insufficient data gathered

In the database, several studies are included and evaluated according to the screening criteria but only one study was selected as the key study and the categorisation of the substance was thus mainly based on the key study. It shall however, be emphasized that the amount of evidence provided by other studies not selected as key studies has influenced the conclusions for categorisation as well. The choice of categories was made solely by the consultant, and apart from the clear evaluation criteria for the categories given above, it may thus be regarded as subjective.

As the present study is based on a screening of available data on the substances on the priority list (a total of 107 substances) and as the quality of the available data is not standardised but quite diverse, a description of a more standardised procedure than the one given above is not possible.

When it comes to a future, in-depth evaluation of the selected CAT 1 candidates, the methodology for characterising the substances as having endocrine disrupting properties shall be well defined and fully transparent. Furthermore, it shall be clearly stated how the priority list can be developed as an iterative list. It shall thus be possible to enter chemicals as well as take out chemicals from the priority list based on sufficient weight of evidence evaluated case by case.

As a starting point, a total of 195 substances were evaluated. An overview of the evaluation and the final categorisation is presented in Table 5.2.

Table 5.2 Overview of the evaluation and the final categorisation

Category	Substance identification	Number of substances
	Remaining substances on the Candidate list	173
	Stakeholder-identified substances	22
Total		**195**
	LPVC	**26**
	HPVC	**10**
	Neither LPVC nor HPVC	**73**
	Substances not in ESIS database	73
	Substances with no CAS No.	15
Substances included in the present evaluation		**107**
CAT 1	At least one study providing evidence for endocrine disruption in an intact organism	34
CAT 2	Potential for endocrine disruption. *In-vitro* data indicating potential for endocrine disruption in intact organisms.	21
CAT 3a	No scientific basis for inclusion in list (ED studies available but no indications of ED effects)	4
CAT 3b	Substances with no or insufficient data gathered	48

The human health effects resulting in CAT 1 substances were selected on a wide range of endocrine disrupting effects as presented in Table 5.3. The main effects were effects on uterus-, testes- or other sex organ weight, effect on sperm development, effects on progeny and effects on sex hormone and levels. Information on wildlife ED effects is relatively scarce and when wildlife effects were used as decisive for a CAT 1 conclusions, these effects were mainly ED-effects on fish, e.g. an *in-vivo* Vitellogenin response.

The effects resulting in CAT 2 substances are as CAT 1 substances based on a wide range of endocrine disrupting effects but solely based on *in-vitro* data as presented in Table 5.4.

Table 5.3 ED effects observed in Category 1 substances. Human [HH] and wildlife [WL] related data

CASNR	NAME	Qualifying remarks_HH	Qualifying remarks_WL
10043-35-3	Boric acid	Rat in vivo study: After a 4-wk administration by gavage, testis and epididymis wts. were decreased in the 300 and 500 mg/kg groups	Amphibian in vivo study: Boric acid exerted reproductive toxicity in Xenopus laevis + transgenerational toxicity to the developing progeny.
104-40-5	4-Nonylphenol (4-NP)	Rat in vivo study: Uterine weight, uterine/body weight significantly increased in 90 mg/kg and 120 mg/kg groups and a dose-response relationship was observed.	Fish in vivo study: Induction of VTG. LOEC= 24.8 ug/l
1113-02-6	Omethoate	Mice in vivo study: Increase in body wt. and decreased testicle wt. The activities of AKP, ACP, LDH in mouse testicles significantly increased compared with the control.	No or insufficient data gathered
1131-60-8	4-Cyclohexylphenol	Rat in vivo study: Uterotrophic assay. Increased uterine weight. LOAEL=200 mg/kg	No or insufficient data gathered
120-47-8	ethyl 4-hydroxybenzoate	Rat and mice in vivo study: Increased uterine weight in immature and ovariectomized animals. ED50 18-74 µmol/ kg body weight	Fish in vivo study. VTG induction in rainbow trouts. LOAEL=100 mg/kg
131-18-0	Di-n-pentylphthalate (DPP) = Dipentylphthalate	Mice in vivo study: A continuous breeding protocol was utilized to examine the reproductive toxicity of di-n-pentyl phthalate (DPP). DPP was toxic to the reproductive system as evidenced by a complete inhibition of fertility at 1.25 and 2.5% DPP and reduced fertility (litter size)	No or insufficient data gathered
131-55-5	Benzophenone-2 (Bp-2), 2,2',4,4'-tetrahydroxybenzophenone	Rat in vivo study: Increased rat uterine weights. ED10=544.6 mg/kg body weight/day	Fish in vivo study: Dose response related VTG induction. LOEC = 8783 mg/L
131-56-6	2,4-Dihydroxybenzophenon = Resbenzophenone	Rat in vivo study: Benzophenone (Bp)-1 increased uterine wt. in immature rats. Furthermore, benzophenone-1 (Bp-1) was in a previous in vitro experiment (MCF-7 cells) shown to have clear estrogenic activity (EC-50: 2.08 uM)	Fish in vivo study: Aquatiic exposure of fathead minnow with BP1 induced vitellogenin significantly at 4919 mg/l
131-70-4	Mono-n-butylphthalate	Rat in vivo study: Decreased male anogenital distance and increased incidence of fetuses with undescended testes. LOAEL=250 mg/kg body weight/day	No or insufficient data gathered
13593-03-8	Quinalphos = Chinalphos	In vivo rat study: Sublethal chronic administration of quinalphos resulted in: decreased testicular mass and AChE activity in central as well as peripheral organs; increased serum LH, FSH, prolactin, and testosterone concns.; decreased pituitary or increased testicular ACE. Ed 7-14 mg/kg/day.	Fish in vivo study: Impairment of testis function due to the inhibition of steroidogenic enzymes activities. EC=0.025 mg/L

CASNR	NAME	Qualifying remarks_HH	Qualifying remarks_WL
15087-24-8	3-Benzylidene camphor (3-BC)	Rat in vivo study: Increase in uterus weight. LOED = 2 mg/kg body weight.day	Fish in vivo study: Vitellogenin induction. ED10, ED50 and ED90 of 3-benzylidene camphor after 6 days (2 injections) were 6.4, 16 and 26 mg/kg/injection, resp
1582-09-8	Trifluralin	In vivo ewe study. Concentrations of estradiol were significantly increased in ewes given trifluralin. No effect on thyroxine concentration. Mean serum concentrations of LH were markedly decreased by trifluralin, and basal LH concentrations were significantly decreased. Only one dosis (17.5 mg/kg 2 times per week) was investigated	Fish in vivo study: Pituitary effects - possibly indirect effect of exposure.
1634-04-4	methyl tertiary butyl ether (MTBE)	Rat in vio study: Increase of testis weight. Interstitial fluid and serum testosterone levels as well as serum prolactin levels were decreased only in animals treated with 1500 mg MTBE/kg/day for 15 days.	Amphibian in vivo study: Accelarated development and earlier metamorphosis. LOEC<2500 mg/L
25013-16-5	tert.-Butylhydroxyanisole (BHA)	In vivo rat study. In one-generation rats, sex ratio of male was decreased and the anogenital distances were shortened and vaginal patency and preputial separation were observed later than control group. Also, BHA decreased sperm motility and number and the width and length. LOEL=10 mg/kg body weight/day	Fish in vivo study: Increased vitellogenin synthesis. EC50=14.14 ug/L
27193-28-8	Phenol, (1,1,3,3-tetramethylbutyl)- = Octylphenol	Rat in vivo study. Reduced sperm counts resulting from lowered plasma testosterone in male rats just after puberty. ED=3 mg/kg body weight.day	Fish in vivo study. VTG induction + intersex gonads. LOEC=11.4 ug/L
33204-76-1	2,6-cis-Diphenylhexamethylcyclotetrasiloxane - 2,6-cis-[(PhMeSiO)2(Me2SiO)2][	In vivo rat study. Inhibited fertility and alterations in measured characteristics of the ejaculate. LOAEL=0.5 mg/kg/day	No or insufficient data gathered
36861-47-9	3-(4-Methylbenzylidene)camphor	Rat in vivo study. Delayed male puberty, and dose-dependently affected reproductive organ wts. of adult male and female F1 offspring, with partly different effect patterns. Thyroid wt. was increased by higher 4-MBC doses. LOAEL=7 mg/kg/day	Amphibian in vivo study.The rate of metamorphosis was not affected, and no obvious differences in body and tail length compared to controls were observed.
4376-20-9	Mono 2 ethyl hexylphthalate (MEHP)	Rat in vivo study. Significantly decreased body weights and motile sperms. LOAEL=250 mg/kg body weight/day	No or insufficient data gathered

CASNR	NAME	Qualifying remarks_HH	Qualifying remarks_WL
50-18-0	Cyclophos-phamide	Rat in vivo assay: Decreased ovarian and uterin weight and reduction serum estradiol and progesterone. LOAEL=50 mg/kg body weight	No or insufficient data gathered
5466-77-3	2-ethyl-hexyl-4-methoxycinna-mate	Rat in vivo assay. Uterine wt. was dose-dependently increased by OMC (ED50 935 mg/kg/day)	Fish in vivo assay. Increase in plasma VTG + and in-creased mRNA expression levels of estrogen receptor (ER) alpha, among sex hormone receptors in the liver.
556-67-2	Cyclotetrasilox-ane	Rat in vivo assay. Uterotrophic assay with two species: Rela-tive uterine wts. and uterine epithelial cell height were statisti-cally significantly increased in both strains of rats at doses above 100 mg/kg/day. LOAEL=250 mg/kg/day	No or insufficient data gathered
611-99-4	4,4'-Dihydroxybenzo-phenon	rat in vivo assay: Induced uterotrophy and exerted both estro-gen agonistic effect and reduced the estrogenic effect of ethy-nylestradiol	Fish in vivo assay: VTG response. In vitro: Full dose-response curves in in vitro assay (recombinant yeast carry-ing the estrogen receptor of rainbow trout (rtERa)). In vivo: VTG response
6164-98-3	Chlordimeform	In vivo rat study. Delay in breeding and a significant redn. in litter size. ED=50 mg/kg.	No or insufficient data gathered
7400-08-0	p-Coumaric acid (PCA)	Rat in vivo assay: 189 and 201% thyroid wts increase com-pared to control value. hyroid lesions in p-coumaric acid group were assocd. with significant increases in cellular proliferation as indicated by [3H]thymidine incorporation. In addn., the goi-trogenic effect of p-coumaric acid was further confirmed by significant decreases (50%) in serum triiodothyronine (T3) and thyroxine (T4), and a parallel increase (90%) in serum TSH compared to control group. ED=0.25 mmol/kg/day	No or insufficient data gathered
77-09-8	3,3'-Bis(4-hydroxy-phenyl)phthalid = Phenolphthaleine	Rat and mice in vivo study. Exposure of mice to phenolphthal-ein in feed for 2 years resulted in increased incidences of atypical hyperplasia of the thymus in males and females, de-generation of the germinal epithelium of the testis in males, and ovarian hyperplasia in females. LOAEL=300 mg/kg	No or insufficient data gathered
77-40-7	2,2-Bis(4-hydroxyphenyl)-n-butan = Bisphenol B	In vivo immature rat uterotrophic assay: Positive response in the uterotrophic assay. Dose reponse relationship (0, 2, 20 and 200 mg/kg)	No or insufficient data gathered
92-69-3	4-Hydroxybiphenyl = 4-Phenylphenol	Rat in vivo assay: Uterotrophic assay and Calbindin-D9k (CaBP-9K) mRNA expression were examd. in ovariectomized Sprague-Dawley female rats. 4-phenylphenol produced dose-dependent (10, 50, 200, and 400 mg/kg/day(increases in the uterine wts. of ovariectomized rats). LOAEL=200 mg/kg/day	No or insufficient data gathered

CASNR	NAME	Qualifying remarks_HH	Qualifying remarks_WL
92-88-6	4,4'-Dihydroxybiphenyl = 4,4'-Biphenol	Rat in vivo study. Rat uterotrophic assay. Uterine weight increase. LOAEL=60 mg/kg body weight/day.	In vitro study. Recombinant yeast assay for trout ER and trout hepatocyte cultures. Competitive binding to ER
94-13-3	n-propyl p-hydroxybenzoate	In vivo rat assay: The epididymal sperm reserves and concentrations decreased dose dependently and the difference was significant at doses of 0.1% and above. LOAEL=0.1%	Fish in vivo assay: Clear dose response increase in VTG response. ED50 = 22 mg kg-1 2-d. NOEC = 225 mg/L
94-26-8	n-Butyl p-Hydroxybenzoate	In vivo mice study. A dose-dependent decrease of both round and elongated spermatid ounts in stages VII-VIII seminiferous tubules was observed, and the elongated spermatid counts were significantly lower in all of the treated groups. The serum testosterone concentration decreased in a dose-dependent fashion and was significant at 1.00%. LOAEL=1504 mg/kg body weight. Day	Rainbow trout in vivo study. Vitellogenin response. LOED: oral exposure to 9 mg butylparaben kg-1 2d-1
96-12-8	Dibromochloropropane (DBCP)	Exposed human workers. Azoospermia oligospermia and dose-dependent change in FSH, LH and testicle size	No or insufficient data gathered
96-45-7	Ethylene Thiourea (ETU)	In vivo rat assay: Alteration in thyroid function and a significant change in thyroid morphol (125 and 625 ppm) . NOEC = 25 ppm	Amphibian in vivo assay: In a standardised ringtested test proposal (Xenopus metamorphosis assay) and five different ETU concns. (5, 10, 25, 50, and 100 mg/L) a concn.-dependent inhibition of metamorphosis was obsd.
99-76-3	Methyl p-Hydroxybenzoate	In vivo mice assay: The highest MePben dose (165 mg/kg) was able to produce uterotrophic effects (38 to 76%) compared to E-2 efects (100%). LOAEL=165 mg/kg	No or insufficient data gathered
99-96-7	p-Hydroxybenzoic acid	Rat in vivo assay: Dose-dependent response (0.5, 5, 50, and 500 g/kg) on vaginal cornification and uterotrophic activity in both immature and adult ovariectomized mice.	No or insufficient data gathered

Table 5.4 ED effects observed in Category 2 substances. Human [HH] and wildlife [WL] related data

CASNR	NAME	Qualifying remarks_HH	Qualifying remarks_WL
100-02-7	4-nitrophenol	In vitro assay: Anti-androgenicity in all four nitrophenols including 4-nitrophenol.	No or insufficient data gathered
106-44-5	p-cresol	in vitro assay: Anti-androgenicity in all four nitrophenols including 4-nitrophenol including 4-nitro-3-phenylphenol (P-cresol).	No or insufficient data gathered
121-29-9	Pyrethrin	In vivo mice assay: Significant percentage of sperm abnormalities. LOAEL=45 mg/kg body weight. Weak endocrine effect.	No or insufficient data gathered
131-16-8	Di-n-propylphthalate (DprP) = Dipropylphthalate	In vitro mice study. Reproduction/teratogenic effects. 44% reduction in the number of live pups per litter. Highest dose group (8.63 g/kg) sterile	No or insufficient data gathered
131-54-4	2,2'-Dihydroxy-4,4'-dimethoxybenzophenon	In vitro assay: Compared with the vehicle control 2,2'-Dihydroxy- 4,4'-dimethoxybenzophenone showed positive effect in theMCF-7 cell proliferation assay.	No or insufficient data gathered
131-57-7	2-hydroxy-4-methoxy-benzophenone	In vitro test.: HMB at a low-toxic level (0.25 mM) in the hepatocyte suspensions was converted enzymatically to 2,4-dihydroxybenzophenone (DHB). DHB at concentrations from 10-8 to 10-6 M caused a concentration-dependent proliferation of MCF-7 cells. Hydroxylated intermediates such as DHB rather than the parent compound act as a xenoestrogen via biotransformation.	Recombinant yeast carrying the estrogen receptor of rainbow trout (rtERa) was used. Relatively low activity of benzophenone-3 was detected
14007-30-8	2,2-Bis(4-hydroxyphenyl)-n-hexane	Rat in vivo assay: Cornification of vaginal epithelium. LOAEL=25 mg/animal. Very old reference	No or insufficient data gathered
1806-29-7	2,2'-Dihydroxybiphenyl = 2,2'-Biphenol	in vivo rat assay: Increase uterus glycogen. LOAEL=40 mg/kg	2,2'-Biphenol showed a very weak estrogenic activity, requring > 10.000 fold excess concentration to inhibit 50% binding of E2.
20427-84-3	4-Nonylphenoldiethoxylate (NP2EO)	In vitro assay: 4-nonylphenoldiethoxylate showed only very weak or no competition (relative binding affinities < < 0.1% c.f. estradiol)	Fish in vivo assay. Slight increase in vitellogenin synthesis (EC=38uL)
2051-60-7	PCB 1 (2-Chlorobiphenyl)	In vitro sudy. Induction of MCF-7 Foci. LOEL=5x10-6 M	No or insufficient data gathered
2051-61-8	PCB 2 (3-Chlorobiphenyl)	Rat in vivo study. Increased uterus weight. LOAEL=160 mg/kg. Old reference - needs to be confirmed.	No or insufficient data gathered

CASNR	NAME	Qualifying remarks_HH	Qualifying remarks_WL
2051-62-9	PCB 3 (4-Chlorobiphenyl)	In vitro assay. Induction of MCF-7 foci	No or insufficient data gathered
2581-34-2	3-methyl-4-nitrophenol	In vitro assay: Positive estrogenic and anti-androgenic activity	No or insufficient data gathered
3115-49-9	4-nonylphenoxy acetic acid	In vitro assay: For [3H]estradiol binding to AFP, 4-nonylphenoxyacetic acid showed significant competition at concns. about 100-fold greater than estradiol	Fish in vivo assay: Increased plasma vitellogenin level
491-80-5	Biochanin A	In vitro study. Activation of ER and estrogenic effect on sensitive biochemical parameters in mouse uterus	No or insufficient data gathered
6807-17-6	2,2-Bis(4-hydroxyphenyl)-4-methyl-n-pentane	In vivo + in vitro assay. Positive effect in uterotrophic assay + positive in the reporter gene assay for ER-alpha agonists	No or insufficient data gathered
81-92-5	2-[Bis(4-hydroxy-phenyl)methyl]benzylalkohol = Phenolphthalol	In vivo assay: Increased uterus weight. LOAEL=4 mg/kg. Old reference	No or insufficient data gathered
83-05-6	p,p'-DDA	In vitro assay: inhibition of progesterone-induced reporter gene activity in a dose-dependent manner	Japanese quail - Thyroid gland: decrease in follicular resorption vacuoles, and an increase in follicular size. Old reference
84-69-5	Diisobutylphthalate	The study demonstrates a developmetal toxicity of DIBP administered to rats by gavage, throughout the embryonic and fetal period. Further experiments are needed to characterize the full scale of DIBP developmental toxicity.	No or insufficient data gathered
84-75-3	Di-n-hexyl phthalate (DnHP) = Dihexylphthalate (DHP)	Review: The data are sufficient to indicate that DnHP is a reproductive toxicant in both sexes of two rodent species following oral exposure + indication of thyroid effects.	No or insufficient data gathered
99-71-8	4-sec-Butylphenol = 4-(1-Methylpropyl)phenol	In vitro assay. Stimulation of cell proliferation. LOEL=10uM	In vitro assay. o-t-butylphenol exhibited TR-binding activities with REC10 values of 4.8 × 10-5 M
2597-03-7'	Elsan = Dimephenthoate	No or insufficient data gathered	in vivo fish assay: Significant redn. in the ovarian weight. LOEC=211ppb

Table 5.5 Overview of the human health relevant systemic toxicity data of Category 1 substances

CASNR	NAME	SPECIES	EFFECT	CRITERIUM	DOSE_CONC.	UNIT_DOSE_
10043-35-3	Boric acid	rabbits	Decreased food intake and vaginal bleeding assocd. with pregnancy loss were the only clear manifestations of toxicity	LOED	250	mg/kg body weight. day
10043-35-3	Boric acid	Sprague-Dawley male rats	Effect level not given			
10043-35-3	Boric acid	rats	Significant decrease in HDL3-cholesterol. No change in body or testicular weight between the control and treatment groups	ED	2	mg/day
104-40-5	4-Nonylphenol (4-NP)	Rat	Endocrine - Estrogenic Maternal Effects - Uterus, cervix, vagina Others - Changes in uterine weight	TDLo	270	mg/kg/3D intermittent
104-40-5	4-Nonylphenol (4-NP)	Rat	Maternal Effects - Ovaries, fallopian tubes Maternal Effects - Uterus, cervix, vagina	TDLo	300	mg/kg /3D intermittent
104-40-5	4-Nonylphenol (4-NP)	Rat	Nutritional and Gross Metabolic - Weight loss or decreased weight gain	TDLo	600	mg/kg /3D intermittent
104-40-5	4-Nonylphenol (4-NP)	Rat	Endocrine - Evidence of thyroid hypofunction Endocrine - Changes in pituitary weight Nutritional and Gross Metabolic - Weight loss or decreased weight gain	TDLo	2000	mg/kg /20D intermittent
104-40-5	4-Nonylphenol (4-NP)	Rat	Kidney, Ureter, and Bladder - Changes in kidney weight Maternal Effects - Ovaries, fallopian tubes Maternal Effects - Uterus, cervix, vagina	TDLo	2000	mg/kg /20D intermittent
104-40-5	4-Nonylphenol (4-NP)	Rat	Others - Changes in uterine weight	TDLo	150	mg/kg/3D intermittent
104-40-5	4-Nonylphenol (4-NP)	Rat	Others - Changes in uterine weight	TDLo	600	mg/kg/3D intermittent
104-40-5	4-Nonylphenol (4-NP)	Rat	Maternal Effects - Other effects Effects on Newborn - Growth statistics (e.g., reduced weight gain) Effects on Newborn - Behavioral	TDLo	1.25	mg/kg

CASNR	NAME	SPECIES	EFFECT	CRITERIUM	DOSE_CONC.	UNIT_DOSE_
104-40-5	4-Nonylphenol (4-NP)	Rat	Maternal Effects - Menstrual cycle changes or disorders	TDLo	2500	mg/kg/25D intermittent
104-40-5	4-Nonylphenol (4-NP)	Rat	Maternal Effects - Menstrual cycle changes or disorders	TDLo	2000	mg/kg /20D intermittent
104-40-5	4-Nonylphenol (4-NP)	Rat	Maternal Effects - Other effects	TDLo	4625	ug/kg
104-40-5	4-Nonylphenol (4-NP)	Rat		LD50	1620	mg/kg
104-40-5	4-Nonylphenol (4-NP)	Rat	Endocrine - Estrogenic Others - Changes in uterine weight	TDLo	600	mg/kg/3D intermittent
104-40-5	4-Nonylphenol (4-NP)	Rat	Maternal Effects - Uterus, cervix, vagina	TDLo	700	mg/kg/14D intermittent
104-40-5	4-Nonylphenol (4-NP)	Rat	Nutritional and Gross Metabolic - Weight loss or decreased weight gain	TDLo	200	mg/kg
104-40-5	4-Nonylphenol (4-NP)	Rat	Maternal Effects - Uterus, cervix, vagina	TDLo	1000	mg/kg /20D intermittent
104-40-5	4-Nonylphenol (4-NP)	Rat	Maternal Effects - Menstrual cycle changes or disorders	TDLo	300	mg/kg/3D intermittent
104-40-5	4-Nonylphenol (4-NP)	Rat	Specific Developmental Abnormalities - Hepatobiliary system Specific Developmental Abnormalities - Urogenital system	TDLo	120	mg/kg
1113-02-6	Omethoate	Chicken		LD50	125	mg/kg
1113-02-6	Omethoate	Cat		LD50	50	mg/kg
1113-02-6	Omethoate	Guinea Pig		LD50	100	mg/kg
1113-02-6	Omethoate	Rabbit		LD50	50	mg/kg
1113-02-6	Omethoate	Mouse	Biochemical - True cholinesterase	LD50	19	mg/kg
1113-02-6	Omethoate	Mouse		LD50	13	mg/kg
1113-02-6	Omethoate	Mouse	Biochemical - True cholinesterase	LD50	140	mg/m3/4H
1113-02-6	Omethoate	Rat		LD50	30	mg/kg
1113-02-6	Omethoate	Rat		LC50	>1500	mg/m3/1H
1113-02-6	Omethoate	Rat		LD50	700	mg/kg
1113-02-6	Omethoate	Rat		LD50	55	mg/kg
1113-02-6	Omethoate	Rat	Blood - Other changes Biochemical - True cholinesterase	TDLo	45500	ug/kg/13W intermittent
1113-02-6	Omethoate	Human			90	mg/L
1113-02-6	Omethoate	Bacteria - E Coli			6385	ug/plate (-S9)

CASNR	NAME	SPECIES	EFFECT	CRITERIUM	DOSE_CONC.	UNIT_DOSE_
1113-02-6	Omethoate	Quail (Labo-ratory)		LD50	50	mg/kg
1113-02-6	Omethoate	Chicken	Paternal Effects - Other effects on male	LD50	75	mg/kg
1113-02-6	Omethoate	Rat	Biochemical - True cholinesterase	LD50	14400	ug/kg
1113-02-6	Omethoate	Mouse	Blood - Changes in bone marrow not included above	TDLo	4500	ug/kg/5D in-termittent
131-18-0	Di-n-pentylphthalate (DPP) = Dipentylphthalate	Rat	Paternal Effects - Testes, epididymis, sperm duct	TDLo	440	mg/kg
131-18-0	Di-n-pentylphthalate (DPP) = Dipentylphthalate	Rat	Kidney, Ureter, and Bladder - Other changes in urine composition	TDLo	220	mg/kg
131-18-0	Di-n-pentylphthalate (DPP) = Dipentylphthalate	Mouse	Effects on Newborn - Live birth index (similar to T26, except measured after birth)	TDLo	504	gm/kg
131-18-0	Di-n-pentylphthalate (DPP) = Dipentylphthalate	Mouse	Paternal Effects - Testes, epididymis, sperm duct	TDLo	504	gm/kg/15W continuous
131-18-0	Di-n-pentylphthalate (DPP) = Dipentylphthalate	Mouse	Liver - Changes in liver weight Kidney, Ureter, and Bladder - Changes in kid-ney weight Nutritional and Gross Meta-bolic - Weight loss or decreased weight gain	TDLo	504	gm/kg/15W continuous
131-18-0	Di-n-pentylphthalate (DPP) = Dipentylphthalate	Rat	Endocrine - Estrogenic Blood - Changes in serum composition (e.g., TP, bilirubin, cholesterol)	TDLo	9000	mg/kg/9D in-termittent
131-18-0	Di-n-pentylphthalate (DPP) = Dipentylphthalate	Rat	Paternal Effects - Spermatogenesis (including genetic material, sperm morphology, motility, and count)	TDLo	1100	mg/kg
131-18-0	Di-n-pentylphthalate (DPP) = Dipentylphthalate	Mouse	Effects on Newborn - Live birth index (similar to T26, except measured after birth)	TDLo	504	gm/kg
131-18-0	Di-n-pentylphthalate (DPP) = Dipentylphthalate	Rat	Others - Changes in testicular weight	TDLo	2200	mg/kg
131-18-0	Di-n-pentylphthalate (DPP) = Dipentylphthalate	Mouse	Effects on Fertility - Female fertility in-dex (e.g., # females pregnant per # sperm positive females # females pregnant per # females mated) Effects on Newborn - Live birth index (similar to T26, except measured after birth)	TDLo	26.6	gm/kg

CASNR	NAME	SPECIES	EFFECT	CRITERIUM	DOSE_CONC.	UNIT_DOSE_
131-18-0	Di-n-pentylphthalate (DPP) = Dipentylphthalate	Mouse	Effects on Fertility - Female fertility index (e.g., # females pregnant per # sperm positive females # females pregnant per # females mated) Effects on Fertility - Male fertility index (e.g., # males impregnating females per # males exposed to fertile n	TDLo	316	gm/kg
131-18-0	Di-n-pentylphthalate (DPP) = Dipentylphthalate	Rat	Paternal Effects - Testes, epididymis, sperm duct	TDLo	6600	mg/kg
131-18-0	Di-n-pentylphthalate (DPP) = Dipentylphthalate	Rat	Paternal Effects - Other effects on male	TDLo	2206	mg/kg
131-18-0	Di-n-pentylphthalate (DPP) = Dipentylphthalate	Rat	Paternal Effects - Spermatogenesis (including genetic material, sperm morphology, motility, and count) Paternal Effects - Testes, epididymis, sperm duct Effects on Fertility - Male fertility index (e.g., # males impregnating females per # males exposed	TDLo	2	gm/kg
131-18-0	Di-n-pentylphthalate (DPP) = Dipentylphthalate	Rat	Paternal Effects - Testes, epididymis, sperm duct Paternal Effects - Prostate, seminal vessicle, Cowper's gland, accessory glands	TDLo	28000	mg/kg/10D intermittent
131-56-6	2,4-Dihydroxybenzophenon = Resbenzophenone	Rat	Gastrointestinal - Other changes Kidney, Ureter, and Bladder - Changes in tubules (including acute renal failure, acute tubular necrosis)	LD50	8600	mg/kg
131-56-6	2,4-Dihydroxybenzophenon = Resbenzophenone	Mammal - Unspecified Species	Nutritional and Gross Metabolic - Weight loss or decreased weight gain	TDLo	10200	mg/kg/85D intermittent
131-56-6	2,4-Dihydroxybenzophenon = Resbenzophenone	Mouse	Nutritional and Gross Metabolic - Weight loss or decreased weight gain	TDLo	9900	mg/kg/35D intermittent
131-56-6	2,4-Dihydroxybenzophenon = Resbenzophenone	Rat	Liver - Changes in liver weight Blood - Pigmented or nucleated red blood cells Blood - Changes in erythrocyte (RBC) count	TDLo	54600	mg/kg/91D intermittent
131-56-6	2,4-Dihydroxybenzophenon = Resbenzophenone	Rabbit	Mild	DRAIZE reaction	100	mg/24H

CASNR	NAME	SPECIES	EFFECT	CRITERIUM	DOSE_CONC.	UNIT_DOSE_
131-56-6	2,4-Dihydroxybenzophenon = Resbenzophenone	Mouse	Gastrointestinal - Other changes Kidney, Ureter, and Bladder - Changes in tubules (including acute renal failure, acute tubular necrosis)	LD50	2500	mg/kg
131-56-6	2,4-Dihydroxybenzophenon = Resbenzophenone	Mouse		LD50	100	mg/kg
131-56-6	2,4-Dihydroxybenzophenon = Resbenzophenone	Rat	Endocrine - Estrogenic	TDLo	47.5	mg/kg
131-56-6	2,4-Dihydroxybenzophenon = Resbenzophenone	Rat	Nutritional and Gross Metabolic - Weight loss or decreased weight gain	TDLo	1000	mg/kg
131-56-6	2,4-Dihydroxybenzophenon = Resbenzophenone	Rat	Behavioral - Somnolence (general depressed activity) Behavioral - Food intake (animal) Gastrointestinal - Hypermotility, diarrhea	LD50	8600	mg/kg
131-56-6	2,4-Dihydroxybenzophenon = Resbenzophenone	Mouse		LD50	85	mg/kg
131-70-4	Mono-n-butylphthalate	Rat	Behavioral - Food intake (animal) Nutritional and Gross Metabolic - Weight loss or decreased weight gain	TDLo	1500	mg/kg/3D intermittent
131-70-4	Mono-n-butylphthalate	Rat	Liver - Changes in liver weight Blood - Changes in serum composition (e.g., TP, bilirubin, cholesterol) Biochemical - Lipids including transport	TDLo	8400	mg/kg/1W continuous
131-70-4	Mono-n-butylphthalate	Rat	Specific Developmental Abnormalities - Craniofacial (including nose and tongue) Specific Developmental Abnormalities - Other developmental abnormalities	TDLo	4500	mg/kg
131-70-4	Mono-n-butylphthalate	Rat	Behavioral - Food intake (animal) Nutritional and Gross Metabolic - Weight loss or decreased weight gain	TDLo	4500	mg/kg/9D continuous
131-70-4	Mono-n-butylphthalate	Rat	Effects on Embryo or Fetus - Other effects to embryo	TDLo	400	mg/kg
131-70-4	Mono-n-butylphthalate	Rat	Effects on Fertility - Post-implantation mortality (e.g., dead and or resorbed implants per total number of implants) Specific Developmental Abnormalities - Urogenital system	TDLo	1500	mg/kg

CASNR	NAME	SPECIES	EFFECT	CRITERIUM	DOSE_CONC.	UNIT_DOSE_
131-70-4	Mono-n-butylphthalate	Rat	Effects on Fertility - Post-implantation mortality (e.g., dead and or resorbed implants per total number of implants) Effects on Embryo or Fetus - Fetotoxicity (except death, e.g., stunted fetus) Specific Developmental Abnormalities - Urogenital system	TDLo	2250	mg/kg
131-70-4	Mono-n-butylphthalate	Rat	Specific Developmental Abnormalities - Urogenital system	TDLo	750	mg/kg
131-70-4	Mono-n-butylphthalate	Rat	Behavioral - Food intake (animal) Nutritional and Gross Metabolic - Weight loss or decreased weight gain Others - Changes in uterine weight	TDLo	9000	mg/kg/9D continuous
131-70-4	Mono-n-butylphthalate	Rat	Effects on Fertility - Post-implantation mortality (e.g., dead and or resorbed implants per total number of implants)	TDLo	1200	mg/kg
131-70-4	Mono-n-butylphthalate	Rat	Behavioral - Straub Tail	TDLo	4500	mg/kg
131-70-4	Mono-n-butylphthalate	Rat	Effects on Fertility - Post-implantation mortality (e.g., dead and or resorbed implants per total number of implants) Specific Developmental Abnormalities - Musculoskeletal system Specific Developmental Abnormalities - Other developmental abnormalities	TDLo	1875	mg/kg
131-70-4	Mono-n-butylphthalate	Rat	Effects on Fertility - Pre-implantation mortality (e.g., reduction in number of implants per female total number of implants per corpora lutea) Effects on Fertility - Post-implantation mortality (e.g., dead and or resorbed implants per total number of i	TDLo	2250	mg/kg
131-70-4	Mono-n-butylphthalate	Rat	Paternal Effects - Testes, epididymis, sperm duct	TDLo	3200	mg/kg
131-70-4	Mono-n-butylphthalate	Mouse	Effects on Fertility - Post-implantation mortality (e.g., dead and or resorbed implants per total number of implants) Effects on Embryo or Fetus - Fetal death	TDLo	400	mg/kg

CASNR	NAME	SPECIES	EFFECT	CRITERIUM	DOSE_CONC.	UNIT_DOSE_
131-70-4	Mono-n-butylphthalate	Mouse	Effects on Embryo or Fetus - Fetotoxicity (except death, e.g., stunted fetus)	TDLo	1200	mg/kg
131-70-4	Mono-n-butylphthalate	Mouse	Paternal Effects - Testes, epididymis, sperm duct	TDLo	16800	mg/kg
131-70-4	Mono-n-butylphthalate	Rat	Effects on Fertility - Pre-implantation mortality (e.g., reduction in number of implants per female total number of implants per corpora lutea) Effects on Fertility - Post-implantation mortality (e.g., dead and or resorbed implants per total number of i	TDLo	6750	mg/kg
131-70-4	Mono-n-butylphthalate	Mouse			1.6	gm/kg
131-70-4	Mono-n-butylphthalate	Mouse		LD50	1	gm/kg
131-70-4	Mono-n-butylphthalate	Mouse	Nutritional and Gross Metabolic - Weight loss or decreased weight gain	TDLo	400	mg/kg
131-70-4	Mono-n-butylphthalate	Rat	Specific Developmental Abnormalities - Urogenital system	TDLo	40	gm/kg
131-70-4	Mono-n-butylphthalate	Rat	Effects on Fertility - Pre-implantation mortality (e.g., reduction in number of implants per female total number of implants per corpora lutea) Effects on Fertility - Post-implantation mortality (e.g., dead and or resorbed implants per total number of i	TDLo	9000	mg/kg
13593-03-8	Quinalphos = Chinalphos	Rabbit	Sense Organs and Special Senses (Nose, Eye, Ear, and Taste) - Chromodacryorrhea Behavioral - Muscle contraction or spasticity Biochemical - True cholinesterase	LD50	50	mg/kg
13593-03-8	Quinalphos = Chinalphos	Rat	Paternal Effects - Other effects on male Endocrine - Change in GH Endocrine - Androgenic	TDLo	6500	ug/kg
13593-03-8	Quinalphos = Chinalphos	Rabbit	Severe	DRAIZE reaction	100	uL
13593-03-8	Quinalphos = Chinalphos	Pigeon	Behavioral - Altered sleep time (including change in righting reflex) Lung, Thorax, or Respiration - Dyspnea Gastrointestinal - Hypermotility, diarrhea	LD50	10500	ug/kg

CASNR	NAME	SPECIES	EFFECT	CRITERIUM	DOSE_CONC.	UNIT_DOSE_
13593-03-8	Quinalphos = Chinalphos	Chicken	Behavioral - Altered sleep time (including change in righting reflex) Lung, Thorax, or Respiration - Dyspnea Gastrointestinal - Hypermotility, diarrhea	LD50	10250	ug/kg
13593-03-8	Quinalphos = Chinalphos	Chicken		LD50	20	mg/kg
13593-03-8	Quinalphos = Chinalphos	Chicken		LD50	25	mg/kg
13593-03-8	Quinalphos = Chinalphos	Dog		LD50	100	mg/kg ['Prehled Prumyslove Toxikologie
13593-03-8	Quinalphos = Chinalphos	Gerbil	Behavioral - Convulsions or effect on seizure threshold Lung, Thorax, or Respiration - Bronchiolar constriction Gastrointestinal - Hypermotility, diarrhea	LD50	11910	ug/kg
13593-03-8	Quinalphos = Chinalphos	Rat	Paternal Effects - Testes, epididymis, sperm duct Paternal Effects - Prostate, seminal vessicle, Cowper's gland, accessory glands Paternal Effects - Other effects on male	TDLo	6500	ug/kg
13593-03-8	Quinalphos = Chinalphos	Guinea Pig	Sense Organs and Special Senses (Nose, Eye, Ear, and Taste) - Chromodacryorrhea Behavioral - Muscle contraction or spasticity Biochemical - True cholinesterase	LD50	250	mg/kg
13593-03-8	Quinalphos = Chinalphos	Cat	Sense Organs and Special Senses (Nose, Eye, Ear, and Taste) - Chromodacryorrhea Behavioral - Muscle contraction or spasticity Biochemical - True cholinesterase	LD50	75	mg/kg
13593-03-8	Quinalphos = Chinalphos	Mouse		LD50	56	mg/kg
13593-03-8	Quinalphos = Chinalphos	Mouse	Sense Organs and Special Senses (Nose, Eye, Ear, and Taste) - Chromodacryorrhea Behavioral - Muscle contraction or spasticity Biochemical - True cholinesterase	LD50	74500	ug/kg
13593-03-8	Quinalphos = Chinalphos	Mouse		LD50	34	mg/kg
13593-03-8	Quinalphos = Chinalphos	Mouse		LC50	330	mg/m3/4H
13593-03-8	Quinalphos = Chinalphos	Rat		LD50	300	mg/kg

CASNR	NAME	SPECIES	EFFECT	CRITERIUM	DOSE_CONC.	UNIT_DOSE_
13593-03-8	Quinalphos = Chinalphos	Rat		LD50	55	mg/kg
13593-03-8	Quinalphos = Chinalphos	Rat		LD50	26	mg/kg
13593-03-8	Quinalphos = Chinalphos	Rat		LD50	39	mg/kg
13593-03-8	Quinalphos = Chinalphos	Rat		LC50	175	mg/m3
13593-03-8	Quinalphos = Chinalphos	Domestic Animals - Goat, Sheep	Peripheral Nerve and Sensation - Spastic paralysis with or without sensory change Behavioral - Somnolence (general depressed activity) Gastrointestinal - Changes in structure or function of salivary glands	LDLo	8500	ug/kg
13593-03-8	Quinalphos = Chinalphos	Hamster		LC50	600	mg/m3/4H
13593-03-8	Quinalphos = Chinalphos	Mouse	Tumorigenic - Neoplastic by RTECS criteria Lung, Thorax, or Respiration - Other changes	TDLo	30	mg/kg/3W
13593-03-8	Quinalphos = Chinalphos	Rat	Endocrine - Estrogenic Paternal Effects - Testes, epididymis, sperm duct Biochemical - Multiple enzyme effects	TDLo	3.75	mg/kg/15D intermittent
13593-03-8	Quinalphos = Chinalphos	Rat	Others - Death	TDLo	557	mg/kg/60D intermittent
13593-03-8	Quinalphos = Chinalphos	Rat	Biochemical - True cholinesterase	TDLo	10800	mg/kg/90D continuous
13593-03-8	Quinalphos = Chinalphos	Rat	Paternal Effects - Spermatogenesis (including genetic material, sperm morphology, motility, and count) Biochemical - True cholinesterase	TDLo	105	mg/kg/15D intermittent
13593-03-8	Quinalphos = Chinalphos	Rat	Paternal Effects - Spermatogenesis (including genetic material, sperm morphology, motility, and count) Biochemical - True cholinesterase Others - Changes in testicular weight	TDLo	150	mg/kg/15D intermittent
13593-03-8	Quinalphos = Chinalphos	Rat	Paternal Effects - Testes, epididymis, sperm duct Others - Changes in testicular weight	TDLo	750	ug/kg/3D intermittent
13593-03-8	Quinalphos = Chinalphos	Rat	Behavioral - Tremor Paternal Effects - Spermatogenesis (including genetic material, sperm morphology, motility, and count) Others - Changes in testicular weight	TDLo	210	mg/kg/15D intermittent

CASNR	NAME	SPECIES	EFFECT	CRITERIUM	DOSE_CONC.	UNIT_DOSE_
13593-03-8	Quinalphos = Chinalphos	Guinea Pig	Brain and Coverings - Changes in brain weight Kidney, Ureter, and Bladder - Changes in bladder weight Others - Changes in ovarian weight	TDLo	60	mg/kg/30D continuous
13593-03-8	Quinalphos = Chinalphos	Domestic Animals - Goat, Sheep	Blood - Other changes Biochemical - True cholinesterase Biochemical - Other esterases	TDLo	10500	ug/kg/21D continuous
13593-03-8	Quinalphos = Chinalphos	Mouse			5	mg/kg
13593-03-8	Quinalphos = Chinalphos	Mouse			5	mg/kg
13593-03-8	Quinalphos = Chinalphos	Rat	Effects on Embryo or Fetus - Fetotoxicity (except death, e.g., stunted fetus)	TDLo	22500	ug/kg
13593-03-8	Quinalphos = Chinalphos	Rat	Maternal Effects - Other effects	TDLo	7500	ug/kg
13593-03-8	Quinalphos = Chinalphos	Gerbil	Paternal Effects - Testes, epididymis, sperm duct	TDLo	15	mg/kg
13593-03-8	Quinalphos = Chinalphos	Mouse			5	mg/kg
1634-04-4	methyl tertiary butyl ether (MTBE)	Rat	Kidney, Ureter, and Bladder - Changes in bladder weight Blood - Changes in serum composition (e.g., TP, bilirubin, cholesterol) Nutritional and Gross Metabolic - Ca	TDLo	27	gm/kg/90D intermittent
1634-04-4	methyl tertiary butyl ether (MTBE)	Mouse		LC50	28000	mg/m3/2H
1634-04-4	methyl tertiary butyl ether (MTBE)	Mouse	Paternal Effects - Testes, epididymis, sperm duct	TDLo	6	gm/kg
1634-04-4	methyl tertiary butyl ether (MTBE)	Mouse	Effects on Fertility - Post-implantation mortality (e.g., dead and or resorbed implants per total number of implants) Specific Developmental Abnormalities - Craniofacial (including nose and tongue) Specific Developmental Abnormalities - Musculoskeletal	TCLo	8000	ppm/6H
1634-04-4	methyl tertiary butyl ether (MTBE)	Mouse	Effects on Embryo or Fetus - Fetotoxicity (except death, e.g., stunted fetus) Specific Developmental Abnormalities - Musculoskeletal system	TCLo	4000	ppm/6H
1634-04-4	methyl tertiary butyl ether (MTBE)	Rat	Effects on Newborn - Viability index (e.g., # alive at day 4 per # born alive) Effects on Newborn - Growth statistics (e.g., reduced weight gain)	TCLo	8000	ppm/6H

CASNR	NAME	SPECIES	EFFECT	CRITERIUM	DOSE_CONC.	UNIT_DOSE_
1634-04-4	methyl tertiary butyl ether (MTBE)	Rat			>148	mg/kg
1634-04-4	methyl tertiary butyl ether (MTBE)	Mouse	increased serum corticosterone levels	LOEL	8000	ppm
1634-04-4	methyl tertiary butyl ether (MTBE)	Bacteria - S Typhimurium			1500	ug/plate (+S9)
1634-04-4	methyl tertiary butyl ether (MTBE)	Rat	Nutritional and Gross Metabolic - Weight loss or decreased weight gain	TDLo	4.2	gm/kg/2W continuous
1634-04-4	methyl tertiary butyl ether (MTBE)	Mouse		LD50	5960	uL/kg
1634-04-4	methyl tertiary butyl ether (MTBE)	Mouse	Behavioral - General anesthetic	LC50	141	gm/m3/15M
1634-04-4	methyl tertiary butyl ether (MTBE)	Rat		LD50	4	gm/kg
1634-04-4	methyl tertiary butyl ether (MTBE)	Rat		LC50	41000	mg/m3/4H
1634-04-4	methyl tertiary butyl ether (MTBE)	Rat		LC50	23576	ppm/4H
1634-04-4	methyl tertiary butyl ether (MTBE)	Rat		LDLo	148	mg/kg
1634-04-4	methyl tertiary butyl ether (MTBE)	Rat	Endocrine - Androgenic	TDLo	1000	mg/kg
1634-04-4	methyl tertiary butyl ether (MTBE)	Mouse		LD50	1700	uL/kg
1634-04-4	methyl tertiary butyl ether (MTBE)	Rat	Nutritional and Gross Metabolic - Weight loss or decreased weight gain Nutritional and Gross Metabolic - Dehydration Others - Changes in testicular weight	TDLo	42000	mg/kg/28D intermittent
1634-04-4	methyl tertiary butyl ether (MTBE)	Rat	Kidney, Ureter, and Bladder - Changes in tubules (including acute renal failure, acute tubular necrosis)	TCLo	1516	ppm/6H/10D intermittent
1634-04-4	methyl tertiary butyl ether (MTBE)	Mouse	Endocrine - Changes in pituitary weight Maternal Effects - Uterus, cervix, vagina Nutritional and Gross Metabolic - Weight loss or decreased weight gain	TCLo	8000	ppm/16W continuous
1634-04-4	methyl tertiary butyl ether (MTBE)	Mouse	Maternal Effects - Uterus, cervix, vagina Maternal Effects - Menstrual cycle changes or disorders Others - Changes in uterine weight	TCLo	8000	ppm/32W continuous
1634-04-4	methyl tertiary butyl ether (MTBE)	Mammal - Unspecified Species	Kidney, Ureter, and Bladder - Other changes Biochemical - Cytochrome oxidases (including oxidative phosphorylation) Biochemical - Transaminases	TCLo	180	mg/m3/6H/15W intermittent

CASNR	NAME	SPECIES	EFFECT	CRITERIUM	DOSE_CONC.	UNIT_DOSE_
1634-04-4	methyl tertiary butyl ether (MTBE)	Mouse	Endocrine - Changes in pituitary weight Maternal Effects - Uterus, cervix, vagina Others - Changes in uterine weight	TCLo	8000	ppm/21D continuous
1634-04-4	methyl tertiary butyl ether (MTBE)	Rat	Brain and Coverings - Recordings from specific arc-as of CNS Biochemical - Catalases Biochemical - Other enzymes	TDLo	210	mg/kg/14D continuous
1634-04-4	methyl tertiary butyl ether (MTBE)	Mouse	Maternal Effects - Uterus, cervix, vagina	TCLo	8000	ppm/3D continuous
1634-04-4	methyl tertiary butyl ether (MTBE)	Rat	Endocrine - Changes in adrenal weight Nutritional and Gross Metabolic - Weight loss or decreased weight gain Nutritional and Gross Metabolic - Dehydration	TDLo	22500	mg/kg/15D intermittent
1634-04-4	methyl tertiary butyl ether (MTBE)	Rat	Endocrine - Evidence of thyroid hyperfunction	TDLo	15000	mg/kg/15D intermittent
1634-04-4	methyl tertiary butyl ether (MTBE)	Rat	Endocrine - Androgenic Others - Death	TDLo	7500	mg/kg/11D intermittent
1634-04-4	methyl tertiary butyl ether (MTBE)	Rat	Liver - Changes in liver weight Endocrine - Androgenic Nutritional and Gross Metabolic - Weight loss or decreased weight gain	TDLo	11200	mg/kg/28D intermittent
1634-04-4	methyl tertiary butyl ether (MTBE)	Rat	Liver - Changes in liver weight Kidney, Ureter, and Bladder - Changes in bladder weight Blood - Changes in serum composition (e.g., TP, bilirubin, cholesterol)	TDLo	49	gm/kg/28D intermittent
1634-04-4	methyl tertiary butyl ether (MTBE)	Rat	Kidney, Ureter, and Bladder - Changes in bladder weight Blood - Changes in erythrocyte (RBC) count Nutritional and Gross Metabolic - Weight loss or decreased weight gain	TDLo	20	gm/kg/14D intermittent
25013-16-5	tert.-Butylhydroxyanisole (BHA)	Rat	Tumorigenic - Neoplastic by RTECS criteria Lung, Thorax, or Respiration - Tumors		4200	mg/kg/10W continuous
25013-16-5	tert.-Butylhydroxyanisole (BHA)	Rat	Tumorigenic - Carcinogenic by RTECS criteria Gastrointestinal - Tumors		728	gm/kg/2Y continuous

CASNR	NAME	SPECIES	EFFECT	CRITERIUM	DOSE_CONC.	UNIT_DOSE_
25013-16-5	tert.-Butylhydroxyanisole (BHA)	Rat	Tumorigenic - Carcinogenic by RTECS criteria Gastrointestinal - Tumors		874	gm/kg/1Y continuous
25013-16-5	tert.-Butylhydroxyanisole (BHA)	Rat	Lung, Thorax, or Respiration - Changes in Lung Weight Blood - Other hemolysis with or without anemia Nutritional and Gross Metabolic - Weight loss or decreased weight gain	TDLo	2688	mg/kg/7D intermittent
25013-16-5	tert.-Butylhydroxyanisole (BHA)	Rat	Tumorigenic - Carcinogenic by RTECS criteria Gastrointestinal - Tumors Endocrine - Tumors		874	gm/kg/2Y continuous
25013-16-5	tert.-Butylhydroxyanisole (BHA)	Rat	Tumorigenic - Carcinogenic by RTECS criteria Kidney, Ureter, and Bladder - Tumors Tumorigenic - Cells (cultured) transformed		269	gm/kg/32W continuous
25013-16-5	tert.-Butylhydroxyanisole (BHA)	Hamster	Tumorigenic - Carcinogenic by RTECS criteria Gastrointestinal - Tumors	TDLo	437	gm/kg/1Y continuous
25013-16-5	tert.-Butylhydroxyanisole (BHA)	Hamster			100	umol/L
25013-16-5	tert.-Butylhydroxyanisole (BHA)	Other Microorganisms			12500	ug/L (-S9)
25013-16-5	tert.-Butylhydroxyanisole (BHA)	Rat	Tumorigenic - Carcinogenic by RTECS criteria Gastrointestinal - Tumors	TDLo	728	gm/kg/2Y continuous
25013-16-5	tert.-Butylhydroxyanisole (BHA)	Rat	Tumorigenic - Equivocal tumorigenic agent by RTECS criteria Gastrointestinal - Tumors		182	gm/kg/2Y continuous
25013-16-5	tert.-Butylhydroxyanisole (BHA)	Rat	Liver - Changes in liver weight	TDLo	182	mg/kg/2Y continuous
25013-16-5	tert.-Butylhydroxyanisole (BHA)	Rat	Liver - Other changes Nutritional and Gross Metabolic - Other changes Biochemical - Hepatic microsomal mixed oxidase (dealkylation, hydroxylation, etc.)	TDLo	3300	mg/kg/12D intermittent
25013-16-5	tert.-Butylhydroxyanisole (BHA)	Monkey	Liver - Other changes Liver - Changes in liver weight Biochemical - Phosphatases	TDLo	14	gm/kg/4W intermittent
25013-16-5	tert.-Butylhydroxyanisole (BHA)	Monkey	Gastrointestinal - Other changes Liver - Changes in liver weight Biochemical - Other enzymes	TDLo	15	gm/kg/84D intermittent

CASNR	NAME	SPECIES	EFFECT	CRITERIUM	DOSE_CONC.	UNIT_DOSE_
25013-16-5	tert.-Butylhydroxyanisole (BHA)	Rat	Tumorigenic - Neoplastic by RTECS criteria Gastrointestinal - Tumors		202	gm/kg/24W continuous
25013-16-5	tert.-Butylhydroxyanisole (BHA)	Hamster	Tumorigenic - Neoplastic by RTECS criteria Gastrointestinal - Tumors		202	gm/kg/24W continuous
25013-16-5	tert.-Butylhydroxyanisole (BHA)	Mouse	Tumorigenic - Equivocal tumorigenic agent by RTECS criteria Gastrointestinal - Tumors	TDLo	874	gm/kg/1Y continuous
25013-16-5	tert.-Butylhydroxyanisole (BHA)	Rat	Liver - Changes in liver weight Biochemical - Phosphatases	TDLo	700	mg/kg/7D intermittent
25013-16-5	tert.-Butylhydroxyanisole (BHA)	Rat	Liver - Other changes Liver - Changes in liver weight Biochemical - Hepatic microsomal mixed oxidase (dealkylation, hydroxylation, etc.)	TDLo	4676	mg/kg/28D continuous
25013-16-5	tert.-Butylhydroxyanisole (BHA)	Mouse	Lung, Thorax, or Respiration - Tumors Tumorigenic - Protects against induction of experimental tumors Tumorigenic - Active as anti-cancer agent	TDLo	1154	gm/kg/8W intermittent
25013-16-5	tert.-Butylhydroxyanisole (BHA)	Mouse	Liver - Other changes Liver - Changes in liver weight Biochemical - Hepatic microsomal mixed oxidase (dealkylation, hydroxylation, etc.)	TDLo	10900	ng/kg/12D intermittent
25013-16-5	tert.-Butylhydroxyanisole (BHA)	Rat	Liver - Tumors Tumorigenic - Protects against induction of experimental tumors Tumorigenic - Active as anti-cancer agent	TDLo	6300	mg/kg/6W continuous
25013-16-5	tert.-Butylhydroxyanisole (BHA)	Human			400	umol/L
25013-16-5	tert.-Butylhydroxyanisole (BHA)	Rat	Biochemical - Other transferases	TDLo	960	mg/kg/2D intermittent
25013-16-5	tert.-Butylhydroxyanisole (BHA)	Rat			250	umol/L
25013-16-5	tert.-Butylhydroxyanisole (BHA)	Mouse	Behavioral - Altered sleep time (including change in righting reflex) Behavioral - Ataxia Lung, Thorax, or Respiration - Respiratory stimulation	LD50	1100	mg/kg
25013-16-5	tert.-Butylhydroxyanisole (BHA)	Mouse	Effects on Newborn - Behavioral	TDLo	12600	mg/kg
25013-16-5	tert.-Butylhydroxyanisole (BHA)	Rabbit		LD50	2100	mg/kg
25013-16-5	tert.-Butylhydroxyanisole (BHA)	Rat	Effects on Newborn - Growth statistics (e.g., reduced weight gain)	TDLo	30	gm/kg

CASNR	NAME	SPECIES	EFFECT	CRITERIUM	DOSE_CONC.	UNIT_DOSE_
25013-16-5	tert.-Butylhydroxyanisole (BHA)	Rat	Blood - Hemorrhage	LD50	881	mg/kg
25013-16-5	tert.-Butylhydroxyanisole (BHA)	Rat	Biochemical - Hepatic microsomal mixed oxidase (dealkylation, hydroxylation, etc.)	TDLo	480	mg/kg
25013-16-5	tert.-Butylhydroxyanisole (BHA)	Rat	Effects on Newborn - Weaning or lactation index (e.g., # alive at weaning per # alive at day 4)	TDLo	36	gm/kg
25013-16-5	tert.-Butylhydroxyanisole (BHA)	Rat			176	gm/kg/21W continuous
25013-16-5	tert.-Butylhydroxyanisole (BHA)	Rat	Behavioral - Altered sleep time (including change in righting reflex) Behavioral - Ataxia Lung, Thorax, or Respiration - Respiratory stimulation	LD50	2	gm/kg
27193-28-8	Phenol, (1,1,3,3-tetramethylbutyl)- = Octylphenol	Rat	Others - Changes in uterine weight	TDLo	900	mg/kg/3D intermittent
27193-28-8	Phenol, (1,1,3,3-tetramethylbutyl)- = Octylphenol	Mouse		LD50	25	mg/kg
27193-28-8	Phenol, (1,1,3,3-tetramethylbutyl)- = Octylphenol	Domestic Animals - Goat, Sheep	Specific Developmental Abnormalities - Endocrine system	TDLo	6	mg/kg
27193-28-8	Phenol, (1,1,3,3-tetramethylbutyl)- = Octylphenol	Rat	Others - Changes in uterine weight	TDLo	2400	mg/kg/3D intermittent
33204-76-1	2,6-cis-Diphenylhexamethylcyclotetrasiloxane - 2,6-cis-[(PhMeSiO)2(Me2SiO)2][	Rabbit	Paternal Effects - Spermatogenesis (including genetic material, sperm morphology, motility, and count)	TDLo	1800	ug/kg
33204-76-1	2,6-cis-Diphenylhexamethylcyclotetrasiloxane - 2,6-cis-[(PhMeSiO)2(Me2SiO)2][	Monkey	Paternal Effects - Testes, epididymis, sperm duct	TDLo	280	mg/kg
33204-76-1	2,6-cis-Diphenylhexamethylcyclotetrasiloxane - 2,6-cis-[(PhMeSiO)2(Me2SiO)2][	Monkey	Paternal Effects - Spermatogenesis (including genetic material, sperm morphology, motility, and count)	TDLo	28	mg/kg
33204-76-1	2,6-cis-Diphenylhexamethylcyclotetrasiloxane - 2,6-cis-[(PhMeSiO)2(Me2SiO)2][	Dog	Paternal Effects - Prostate, seminal vessicle, Cowper's gland, accessory glands	TDLo	400	mg/kg

CASNR	NAME	SPECIES	EFFECT	CRITERIUM	DOSE_CONC.	UNIT_DOSE_
33204-76-1	2,6-cis-Diphenylhexamethylcyclotetrasiloxane - 2,6-cis-[(PhMeSiO)2(Me2SiO)2][	Dog	Paternal Effects - Spermatogenesis (including genetic material, sperm morphology, motility, and count) Paternal Effects - Testes, epididymis, sperm duct	TDLo	400	mg/kg
33204-76-1	2,6-cis-Diphenylhexamethylcyclotetrasiloxane - 2,6-cis-[(PhMeSiO)2(Me2SiO)2][	Rabbit	Paternal Effects - Testes, epididymis, sperm duct	TDLo	4	mg/kg
33204-76-1	2,6-cis-Diphenylhexamethylcyclotetrasiloxane - 2,6-cis-[(PhMeSiO)2(Me2SiO)2][	Mouse	Paternal Effects - Prostate, seminal vessicle, Cowper's gland, accessory glands	TDLo	210	mg/kg
33204-76-1	2,6-cis-Diphenylhexamethylcyclotetrasiloxane - 2,6-cis-[(PhMeSiO)2(Me2SiO)2][	Rat	Maternal Effects - Uterus, cervix, vagina	TDLo	3	mg/kg
33204-76-1	2,6-cis-Diphenylhexamethylcyclotetrasiloxane - 2,6-cis-[(PhMeSiO)2(Me2SiO)2][	Rat	Effects on Fertility - Female fertility index (e.g., # females pregnant per # sperm positive females # females pregnant per # females mated)	TDLo	1	mg/kg
33204-76-1	2,6-cis-Diphenylhexamethylcyclotetrasiloxane - 2,6-cis-[(PhMeSiO)2(Me2SiO)2][	Dog	Paternal Effects - Prostate, seminal vessicle, Cowper's gland, accessory glands Paternal Effects - Other effects on male	TDLo	10	gm/kg
33204-76-1	2,6-cis-Diphenylhexamethylcyclotetrasiloxane - 2,6-cis-[(PhMeSiO)2(Me2SiO)2][	Mouse		LD50	>5	gm/kg
33204-76-1	2,6-cis-Diphenylhexamethylcyclotetrasiloxane - 2,6-cis-[(PhMeSiO)2(Me2SiO)2][	Rat	Maternal Effects - Uterus, cervix, vagina	TDLo	300	ug/kg
33204-76-1	2,6-cis-Diphenylhexamethylcyclotetrasiloxane - 2,6-cis-[(PhMeSiO)2(Me2SiO)2][	Rat	Effects on Fertility - Other measures of fertility	TDLo	3	mg/kg

CASNR	NAME	SPECIES	EFFECT	CRITERIUM	DOSE_CONC.	UNIT_DOSE_
33204-76-1	2,6-cis-Diphenylhexamethylcyclotetrasiloxane - 2,6-cis-[(PhMeSiO)2(Me2SiO)2][	Rat	Effects on Fertility - Post-implantation mortality (e.g., dead and or resorbed implants per total number of implants)	TDLo	10	mg/kg
33204-76-1	2,6-cis-Diphenylhexamethylcyclotetrasiloxane - 2,6-cis-[(PhMeSiO)2(Me2SiO)2][	Rat	Paternal Effects - Prostate, seminal vessicle, Cowper's gland, accessory glands	TDLo	7	mg/kg
33204-76-1	2,6-cis-Diphenylhexamethylcyclotetrasiloxane - 2,6-cis-[(PhMeSiO)2(Me2SiO)2][	Rat	Paternal Effects - Testes, epididymis, sperm duct Paternal Effects - Prostate, seminal vessicle, Cowper's gland, accessory glands	TDLo	231	mg/kg
33204-76-1	2,6-cis-Diphenylhexamethylcyclotetrasiloxane - 2,6-cis-[(PhMeSiO)2(Me2SiO)2][	Rat		LD50	>5	gm/kg
4376-20-9	Mono 2 ethyl hexylphthalate (MEHP)	Rat	Biochemical - Dehydrogenases	TDLo	675	mg/kg/90D continuous
4376-20-9	Mono 2 ethyl hexylphthalate (MEHP)	Hamster	Paternal Effects - Testes, epididymis, sperm duct	TDLo	9	gm/kg
4376-20-9	Mono 2 ethyl hexylphthalate (MEHP)	Mouse	Effects on Fertility - Pre-implantation mortality (e.g., reduction in number of implants per female total number of implants per corpora lutea)	TDLo	350	mg/kg
4376-20-9	Mono 2 ethyl hexylphthalate (MEHP)	Bacteria - B Subtilis			400	ug/disc
4376-20-9	Mono 2 ethyl hexylphthalate (MEHP)	Rat			200	umol/L/24H
4376-20-9	Mono 2 ethyl hexylphthalate (MEHP)	Hamster			750	mg/L (+S9)
4376-20-9	Mono 2 ethyl hexylphthalate (MEHP)	Mouse	Nutritional and Gross Metabolic - Weight loss or decreased weight gain	TDLo	5111	mg/kg/19D continuous
4376-20-9	Mono 2 ethyl hexylphthalate (MEHP)	Rat	Liver - Changes in liver weight Biochemical - Dehydrogenases Biochemical - Other transferases	TDLo	7	gm/kg/14D intermittent

CASNR	NAME	SPECIES	EFFECT	CRITERIUM	DOSE_CONC.	UNIT_DOSE_
4376-20-9	Mono 2 ethyl hexylphthalate (MEHP)	Rat	Liver - Changes in liver weight Blood - Changes in serum composition (e.g., TP, bilirubin, cholesterol) Biochemical - Lipids including transport	TDLo	8400	mg/kg/1W continuous
4376-20-9	Mono 2 ethyl hexylphthalate (MEHP)	Rat	Liver - Changes in liver weight	TDLo	6825	mg/kg/26W continuous
4376-20-9	Mono 2 ethyl hexylphthalate (MEHP)	Hamster	Liver - Changes in liver weight Biochemical - Hepatic microsomal mixed oxidase (dealkylation, hydroxylation, etc.) Biochemical - Other transferases	TDLo	7	gm/kg/14D intermittent
4376-20-9	Mono 2 ethyl hexylphthalate (MEHP)	Rat		LD50	415	mg/kg
4376-20-9	Mono 2 ethyl hexylphthalate (MEHP)	Hamster			750	mg/L
4376-20-9	Mono 2 ethyl hexylphthalate (MEHP)	Rat	Blood - Pigmented or nucleated red blood cells Blood - Changes in leukocyte (WBC) count	TDLo	168	mg/kg/28D continuous
4376-20-9	Mono 2 ethyl hexylphthalate (MEHP)	Hamster			375	mg/kg
4376-20-9	Mono 2 ethyl hexylphthalate (MEHP)	Mouse			25	mg/kg
4376-20-9	Mono 2 ethyl hexylphthalate (MEHP)	Rat		LD50	150	mg/kg
4376-20-9	Mono 2 ethyl hexylphthalate (MEHP)	Rat		LD50	1340	mg/kg
4376-20-9	Mono 2 ethyl hexylphthalate (MEHP)	Hamster			25	mg/L
4376-20-9	Mono 2 ethyl hexylphthalate (MEHP)	Rat			2	mmol/L
4376-20-9	Mono 2 ethyl hexylphthalate (MEHP)	Mouse		LD50	240	mg/kg
4376-20-9	Mono 2 ethyl hexylphthalate (MEHP)	Mouse		LD50	208	mg/kg
4376-20-9	Mono 2 ethyl hexylphthalate (MEHP)	Rat	Paternal Effects - Testes, epididymis, sperm duct	TDLo	400	mg/kg
4376-20-9	Mono 2 ethyl hexylphthalate (MEHP)	Rat	Not reported	DRAIZE reaction	100	mg

CASNR	NAME	SPECIES	EFFECT	CRITERIUM	DOSE_CONC.	UNIT_DOSE_
4376-20-9	Mono 2 ethyl hexylphthalate (MEHP)	Mouse	Effects on Fertility - Post-implantation mortality (e.g., dead and or resorbed implants per total number of implants) Effects on Embryo or Fetus - Other effects to embryo	TDLo	1241	mg/kg
4376-20-9	Mono 2 ethyl hexylphthalate (MEHP)	Mouse	Effects on Fertility - Post-implantation mortality (e.g., dead and or resorbed implants per total number of implants) Effects on Embryo or Fetus - Fetal death	TDLo	665	mg/kg
4376-20-9	Mono 2 ethyl hexylphthalate (MEHP)	Human			5	mmol/L/1H
4376-20-9	Mono 2 ethyl hexylphthalate (MEHP)	Mouse	Specific Developmental Abnormalities - Musculoskeletal system	TDLo	100	mg/kg
4376-20-9	Mono 2 ethyl hexylphthalate (MEHP)	Mouse	Effects on Fertility - Post-implantation mortality (e.g., dead and or resorbed implants per total number of implants) Effects on Fertility - Litter size (e.g., # fetuses per litter, measured before birth)	TDLo	596.7	mg/kg
4376-20-9	Mono 2 ethyl hexylphthalate (MEHP)	Rat	Effects on Newborn - Other neonatal measures or effects	TDLo	4500	mg/kg
4376-20-9	Mono 2 ethyl hexylphthalate (MEHP)	Mouse	Effects on Embryo or Fetus - Fetotoxicity (except death, e.g., stunted fetus)	TDLo	100	mg/kg
4376-20-9	Mono 2 ethyl hexylphthalate (MEHP)	Rat	Paternal Effects - Spermatogenesis (including genetic material, sperm morphology, motility, and count)	TDLo	3750	mg/kg
4376-20-9	Mono 2 ethyl hexylphthalate (MEHP)	Mouse	Effects on Embryo or Fetus - Fetotoxicity (except death, e.g., stunted fetus)	TDLo	2546	mg/kg
4376-20-9	Mono 2 ethyl hexylphthalate (MEHP)	Rat	Paternal Effects - Spermatogenesis (including genetic material, sperm morphology, motility, and count)	TDLo	2	gm/kg
4376-20-9	Mono 2 ethyl hexylphthalate (MEHP)	Rat	Paternal Effects - Testes, epididymis, sperm duct	TDLo	6320	ug/kg
4376-20-9	Mono 2 ethyl hexylphthalate (MEHP)	Rat	Paternal Effects - Other effects on male	TDLo	500	mg/kg

CASNR	NAME	SPECIES	EFFECT	CRITERIUM	DOSE_CONC.	UNIT_DOSE_
4376-20-9	Mono 2 ethyl hexylphthalate (MEHP)	Rat	Paternal Effects - Prostate, seminal vessicle, Cowper's gland, accessory glands	TDLo	1	gm/kg
4376-20-9	Mono 2 ethyl hexylphthalate (MEHP)	Mouse	Effects on Fertility - Litter size (e.g., # fetuses per litter, measured before birth)	TDLo	4360	mg/kg
4376-20-9	Mono 2 ethyl hexylphthalate (MEHP)	Mouse	Effects on Fertility - Post-implantation mortality (e.g., dead and or resorbed implants per total number of implants) Effects on Fertility - Litter size (e.g., # fetuses per litter, measured before birth) Effects on Embryo or Fetus - Fe-totoxicity (excep	TDLo	1193.4	mg/kg
4376-20-9	Mono 2 ethyl hexylphthalate (MEHP)	Mouse	Specific Developmental Abnormalities - Cardiovascular (circulatory) system	TDLo	1387	mg/kg
611-99-4	4,4'-Dihydroxybenzophenon	Rat	Endocrine - Estrogenic	TDLo	47.5	mg/kg
611-99-4	4,4'-Dihydroxybenzophenon	Mouse			>500	mg/kg
611-99-4	4,4'-Dihydroxybenzophenon	Hamster			200	umol/L
611-99-4	4,4'-Dihydroxybenzophenon	Rat	Others - Changes in uterine weight	TDLo	600	mg/kg/3D in-termittent
6164-98-3	Chlordimeform	Rat	Endocrine - Other changes	TDLo	40	mg/kg
6164-98-3	Chlordimeform	Mouse		LD50	71	mg/kg
6164-98-3	Chlordimeform	Mouse	Blood - Tumors	TDLo	2184	mg/kg/104W continuous
6164-98-3	Chlordimeform	Rat	Endocrine - Change in gonadotropins Endocrine - Evidence of thyroid hypo-function Endocrine - Androgenic	TDLo	100	mg/kg
6164-98-3	Chlordimeform	Hamster	Endocrine - Effect on menstrual cycle	LD50	200	mg/kg
6164-98-3	Chlordimeform	Rat		LD50	160	mg/kg
6164-98-3	Chlordimeform	mice	decrease in IgM antibody-forming cells	LOEL	20	mg/kg body-weight.day
6164-98-3	Chlordimeform	Mammal - Unspecified Species		LC50	>5800	mg/m3/1H
6164-98-3	Chlordimeform	Rabbit		LD50	625	mg/kg
6164-98-3	Chlordimeform	Rabbit	Severe	DRAIZE reaction	100	mg

CASNR	NAME	SPECIES	EFFECT	CRITERIUM	DOSE_CONC.	UNIT_DOSE_
6164-98-3	Chlordimeform	Rabbit		LD50	640	mg/kg
6164-98-3	Chlordimeform	Rat	Effects on Newborn - Behavioral	TDLo	1800	ug/kg
6164-98-3	Chlordimeform	Rat	Behavioral - Alteration if operant conditioning	TDLo	60	mg/kg/3D intermittent
6164-98-3	Chlordimeform	Mouse	Tumorigenic - Carcinogenic by RTECS criteria Vascular - Tumors Lung, Thorax, or Respiration - Tumors	TDLo	6552	mg/kg/78W continuous
6164-98-3	Chlordimeform	Human			1	mmol/L
6164-98-3	Chlordimeform	Insects - D Melanogaster			10	ppb
6164-98-3	Chlordimeform	Bacteria - S Typhimurium			2	umol/plate (-S9)
6164-98-3	Chlordimeform	Rat			60	mg/kg
6164-98-3	Chlordimeform	Hamster	Endocrine - Other changes	TDLo	75	mg/kg
6164-98-3	Chlordimeform	Rat	Biochemical - Effect on inflammation or mediation of inflammation	TDLo	40	mg/kg
6164-98-3	Chlordimeform	Rat	Cardiac - Change in rate Vascular - BP lowering not characterized in autonomic section	TDLo	5	mg/kg
6164-98-3	Chlordimeform	Rat	Endocrine - Androgenic Paternal Effects - Spermatogenesis (including genetic material, sperm morphology, motility, and count) Nutritional and Gross Metabolic - Weight loss or decreased weight gain	TDLo	200	mg/kg
6164-98-3	Chlordimeform	Rat	Endocrine - Change in gonadotropins Blood - Other changes	TDLo	50	mg/kg
6164-98-3	Chlordimeform	rat	increase in ACTH, CORT and PL	LOEL	20	mg/kg body weight
6164-98-3	Chlordimeform	Rat	Endocrine - Adrenal cortex hyperplasia	TDLo	20	mg/kg
6164-98-3	Chlordimeform	Rat	Blood - U28	TDLo	20	mg/kg
6164-98-3	Chlordimeform	Hamster	Endocrine - Change in gonadotropins Maternal Effects - Oogenesis Maternal Effects - Ovaries, fallopian tubes	TDLo	150	mg/kg
6164-98-3	Chlordimeform	Mouse	Brain and Coverings - Other degenerative changes	TDLo	35	mg/kg

CASNR	NAME	SPECIES	EFFECT	CRITERIUM	DOSE_CONC.	UNIT_DOSE_
6164-98-3	Chlordimeform	Hamster	Endocrine - Change in GH Endocrine - Estrogenic	TDLo	37.5	mg/kg
6164-98-3	Chlordimeform	Rat		LD50	90	mg/kg
6164-98-3	Chlordimeform	Rat		LD50	263	mg/kg
6164-98-3	Chlordimeform	Human			1	mmol/L
6164-98-3	Chlordimeform	Mouse		LD50	160	mg/kg
6164-98-3	Chlordimeform	Mouse		LD50	225	mg/kg
7400-08-0	p-Coumaric acid (PCA)	Mouse	Effects on Fertility - Abortion	TDLo	50	mg/kg
7400-08-0	p-Coumaric acid (PCA)	Mouse		LD50	657	mg/kg
7400-08-0	p-Coumaric acid (PCA)	Mouse	Effects on Fertility - Other measures of fertility	TDLo	35	mg/kg
7400-08-0	p-Coumaric acid (PCA)	Rat	Paternal Effects - Testes, epididymis, sperm duct Paternal Effects - Prostate, seminal vessicle, Cowper's gland, accessory glands Effects on Fertility - Mating performance (e.g., # sperm positive females per # females mated # copulations per # estrus cy	TDLo	2800	mg/kg
7400-08-0	p-Coumaric acid (PCA)	Mammal - Unspecified Species	Maternal Effects - Uterus, cervix, vagina	TDLo	9600	mg/kg
77-09-8	3,3'-Bis(4-hydroxyphenyl)phthalid = Phenolphthaleine	Rat	Endocrine - Estrogenic	TDLo	95	mg/kg
77-09-8	3,3'-Bis(4-hydroxyphenyl)phthalid = Phenolphthaleine	Mouse			1680	mg/kg/14D continuous
77-09-8	3,3'-Bis(4-hydroxyphenyl)phthalid = Phenolphthaleine	Mouse	Tumorigenic - Carcinogenic by RTECS criteria Blood - Lymphomas including Hodgkin's disease	TDLo	432600	mg/kg/103W continuous
77-09-8	3,3'-Bis(4-hydroxyphenyl)phthalid = Phenolphthaleine	Rat	Tumorigenic - Neoplastic by RTECS criteria Endocrine - Adrenal cortex tumors	TDLo	360500	mg/kg/103W continuous
77-09-8	3,3'-Bis(4-hydroxyphenyl)phthalid = Phenolphthaleine	Rat		LDLo	500	mg/kg
77-09-8	3,3'-Bis(4-hydroxyphenyl)phthalid = Phenolphthaleine	Mouse	Specific Developmental Abnormalities - Urogenital system	TDLo	840	mg/kg

CASNR	NAME	SPECIES	EFFECT	CRITERIUM	DOSE_CONC.	UNIT_DOSE_
77-09-8	3,3'-Bis(4-hydroxyphenyl)phthalid = Phenolphthaleine	Mouse	Effects on Newborn - Live birth index (similar to T26, except measured after birth)	TDLo	840	mg/kg
77-09-8	3,3'-Bis(4-hydroxyphenyl)phthalid = Phenolphthaleine	Rat	Liver - Changes in liver weight Blood - Changes in serum composition (e.g., TP, bilirubin, cholesterol) Nutritional and Gross Metabolic - Weight loss or decreased weight gain	TDLo	324	gm/kg/13W continuous
77-09-8	3,3'-Bis(4-hydroxyphenyl)phthalid = Phenolphthaleine	Mouse	Liver - Changes in liver weight Blood - Changes in erythrocyte (RBC) count Others - Changes in testicular weight	TDLo	106	gm/kg/13W continuous
77-09-8	3,3'-Bis(4-hydroxyphenyl)phthalid = Phenolphthaleine	Mouse	Liver - Tumors Tumorigenic - Active as anti-cancer agent	TDLo	288400	mg/kg/103W continuous
77-09-8	3,3'-Bis(4-hydroxyphenyl)phthalid = Phenolphthaleine	Rat	Tumorigenic - Equivocal tumorigenic agent by RTECS criteria Kidney, Ureter, and Bladder - Kidney tumors	TDLo	1442000	mg/kg/103W continuous
77-09-8	3,3'-Bis(4-hydroxyphenyl)phthalid = Phenolphthaleine	Human			23.2	mg/L/22H
77-09-8	3,3'-Bis(4-hydroxyphenyl)phthalid = Phenolphthaleine	Mouse	Tumorigenic - Carcinogenic by RTECS criteria Endocrine - Tumors Skin and Appendages - Tumors	TDLo	281	gm/kg/2Y continuous
77-09-8	3,3'-Bis(4-hydroxyphenyl)phthalid = Phenolphthaleine	Mouse	Tumorigenic - Carcinogenic by RTECS criteria Blood - Lymphomas including Hodgkin's disease	TDLo	288400	mg/kg/103W continuous
77-09-8	3,3'-Bis(4-hydroxyphenyl)phthalid = Phenolphthaleine	Rat	Tumorigenic - Carcinogenic by RTECS criteria Kidney, Ureter, and Bladder - Tumors Endocrine - Adrenal cortex tumors	TDLo	364	gm/kg/2Y continuous
77-09-8	3,3'-Bis(4-hydroxyphenyl)phthalid = Phenolphthaleine	Rat	Tumorigenic - Equivocal tumorigenic agent by RTECS criteria Endocrine - Adrenal cortex tumors	TDLo	360500	mg/kg/103W continuous
77-09-8	3,3'-Bis(4-hydroxyphenyl)phthalid = Phenolphthaleine	Rat			>1	gm/kg
77-09-8	3,3'-Bis(4-hydroxyphenyl)phthalid = Phenolphthaleine	Mouse	Kidney, Ureter, and Bladder - Changes in kidney weight Paternal Effects - Testes, epididymis, sperm duct	TDLo	123.48	gm/kg/21W continuous
77-09-8	3,3'-Bis(4-hydroxyphenyl)phthalid = Phenolphthaleine	Mouse	Maternal Effects - Parturition Effects on Fertility - Other measures of fertility	TDLo	29.4	gm/kg

CASNR	NAME	SPECIES	EFFECT	CRITERIUM	DOSE_CONC.	UNIT_DOSE_
77-09-8	3,3'-Bis(4-hydroxyphenyl)phthalid = Phenolphthaleine	Mouse	Effects on Newborn - Live birth index (similar to T26, except measured after birth)	TDLo	123.48	gm/kg
77-09-8	3,3'-Bis(4-hydroxyphenyl)phthalid = Phenolphthaleine	Rat	Endocrine - Estrogenic Endocrine - Changes in endocrine weight (unspecified) Biochemical - Other carbohydrates	TDLo	160	mg/kg/18H
77-09-8	3,3'-Bis(4-hydroxyphenyl)phthalid = Phenolphthaleine	Man	Gastrointestinal - Gastritis Gastrointestinal - Nausea or vomiting Kidney, Ureter, and Bladder - Other changes in urine composition	TDLo	29	mg/kg
77-40-7	2,2-Bis(4-hydroxyphenyl)-n-butan = Bisphenol B	Rat	Maternal Effects - Uterus, cervix, vagina Maternal Effects - Other effects	TDLo	600	mg/kg/3D intermittent
92-69-3	4-Hydroxybiphenyl = 4-Phenylphenol	Mouse		LD50	150	mg/kg
92-69-3	4-Hydroxybiphenyl = 4-Phenylphenol	Mouse	Liver - Other changes	LD50	150	mg/kg
92-69-3	4-Hydroxybiphenyl = 4-Phenylphenol	Mouse	Tumorigenic - Equivocal tumorigenic agent by RTECS criteria Lung, Thorax, or Respiration - Tumors Blood - Leukemia	TDLo	153	gm/kg/78W intermittent
92-69-3	4-Hydroxybiphenyl = 4-Phenylphenol	Mouse	Tumorigenic - Carcinogenic by RTECS criteria Blood - Tumors	TDLo	1000	mg/kg
92-88-6	4,4'-Dihydroxybiphenyl = 4,4'-Biphenol	Mouse	Blood - Changes in bone marrow not included above	TDLo	40	mg/kg/12H
92-88-6	4,4'-Dihydroxybiphenyl = 4,4'-Biphenol	Human			100	nmol/L
92-88-6	4,4'-Dihydroxybiphenyl = 4,4'-Biphenol	Mouse			40	mg/kg
92-88-6	4,4'-Dihydroxybiphenyl = 4,4'-Biphenol	Human			5	umol/L
92-88-6	4,4'-Dihydroxybiphenyl = 4,4'-Biphenol	Rabbit		LD50	1780	mg/kg
92-88-6	4,4'-Dihydroxybiphenyl = 4,4'-Biphenol	Rat	Lung, Thorax, or Respiration - Other changes Liver - Other changes Kidney, Ureter, and Bladder - Other changes	LD50	4920	mg/kg

CASNR	NAME	SPECIES	EFFECT	CRITERIUM	DOSE_CONC.	UNIT_DOSE_
92-88-6	4,4'-Dihydroxybiphenyl = 4,4'-Biphenol	Rat	Endocrine - Estrogenic	TDLo	190	mg/kg
92-88-6	4,4'-Dihydroxybiphenyl = 4,4'-Biphenol	Mouse		LD50	100	mg/kg
94-13-3	Phenol, 2-octyl-	Rat		LD50	2800	mg/kg
96-45-7	Ethylene Thiourea (ETU)	Rat	Tumorigenic - Carcinogenic by RTECS criteria Endocrine - Thyroid tumors	TDLo	10815	mg/kg/103W continuous
96-45-7	Ethylene Thiourea (ETU)	Rat	Nutritional and Gross Metabolic - Weight loss or decreased weight gain	TDLo	75	mg/kg/8W continuous
96-45-7	Ethylene Thiourea (ETU)	Rat	Tumorigenic - Carcinogenic by RTECS criteria Endocrine - Thyroid tumors	TDLo	5475	mg/kg/1Y continuous
96-45-7	Ethylene Thiourea (ETU)	Rat	Liver - Changes in liver weight Endocrine - Changes in thyroid weight	TDLo	375	mg/kg/8W continuous
96-45-7	Ethylene Thiourea (ETU)	Rat	Tumorigenic - Carcinogenic by RTECS criteria Lung, Thorax, or Respiration - Tumors Endocrine - Thyroid tumors	TDLo	5306	mg/kg/77W continuous
96-45-7	Ethylene Thiourea (ETU)	Rat	Cardiac - Changes in heart weight	TDLo	2281	mg/kg/26W continuous
96-45-7	Ethylene Thiourea (ETU)	Rat	Tumorigenic - Carcinogenic by RTECS criteria Endocrine - Thyroid tumors	TDLo	9012.5	mg/kg/103W continuous
96-45-7	Ethylene Thiourea (ETU)	Rat	Kidney, Ureter, and Bladder - Changes in kidney weight Endocrine - Changes in Spleen weight	TDLo	1500	mg/kg/8W continuous
96-45-7	Ethylene Thiourea (ETU)	Rat	Endocrine - Evidence of thyroid hypofunction	TDLo	1140.6	mg/kg/26W continuous
96-45-7	Ethylene Thiourea (ETU)	Rat	Endocrine - Evidence of thyroid hyperfunction	TDLo	2281	mg/kg/1Y continuous
96-45-7	Ethylene Thiourea (ETU)	Rat	Endocrine - Other changes Endocrine - Changes in thyroid weight Blood - Changes in serum composition (e.g., TP, bilirubin, cholesterol)	TDLo	764	mg/kg/90D continuous
96-45-7	Ethylene Thiourea (ETU)	Rat	Tumorigenic - Carcinogenic by RTECS criteria Endocrine - Thyroid tumors	TDLo	9125	mg/kg/1Y continuous
96-45-7	Ethylene Thiourea (ETU)	Mouse	Tumorigenic - Carcinogenic by RTECS criteria Liver - Tumors Endocrine - Thyroid tumors	TDLo	86520	mg/kg/103W continuous

CASNR	NAME	SPECIES	EFFECT	CRITERIUM	DOSE_CONC.	UNIT_DOSE_
96-45-7	Ethylene Thiourea (ETU)	Mouse	Tumorigenic - Carcinogenic by RTECS criteria Liver - Tumors Endocrine - Thyroid tumors	TDLo	87360	mg/kg/2Y continuous
96-45-7	Ethylene Thiourea (ETU)	Man	Endocrine - Evidence of thyroid hypofunction	TCLo	10	ug/m3/10Y intermittent
96-45-7	Ethylene Thiourea (ETU)	Rat	Endocrine - Other changes Blood - Changes in serum composition (e.g., TP, bilirubin, cholesterol)	TDLo	297	mg/kg/28D continuous
96-45-7	Ethylene Thiourea (ETU)	Rat	Endocrine - Other changes Endocrine - Changes in thyroid weight Nutritional and Gross Metabolic - Weight loss or decreased weight gain	TDLo	3600	mg/kg/17W continuous
96-45-7	Ethylene Thiourea (ETU)	Rat	Endocrine - Evidence of thyroid hypofunction Endocrine - Changes in thyroid weight	TDLo	34.86	mg/kg/7D continuous
96-45-7	Ethylene Thiourea (ETU)	Rat	Endocrine - Evidence of thyroid hypofunction	TDLo	29.05	mg/kg/7D continuous
96-45-7	Ethylene Thiourea (ETU)	Rat	Endocrine - Changes in Spleen weight	TDLo	5475	mg/kg/26W continuous
96-45-7	Ethylene Thiourea (ETU)	Mouse	Liver - Changes in liver weight Endocrine - Evidence of thyroid hypofunction Biochemical - Cytochrome oxidases (including oxidative phosphorylation)	TDLo	840	mg/kg/7D continuous
96-45-7	Ethylene Thiourea (ETU)	Rat	Endocrine - Evidence of thyroid hypofunction	TDLo	10950	mg/kg/1Y continuous
96-45-7	Ethylene Thiourea (ETU)	Mouse	Tumorigenic - Carcinogenic by RTECS criteria Liver - Tumors Blood - Lymphomas including Hodgkin's disease	TDLo	77	gm/kg/82W continuous
96-45-7	Ethylene Thiourea (ETU)	Mouse	Liver - Changes in liver weight Endocrine - Evidence of thyroid hypofunction	TDLo	277.2	mg/kg/7D continuous
96-45-7	Ethylene Thiourea (ETU)	Rat	Behavioral - Food intake (animal) Endocrine - Changes in thyroid weight Nutritional and Gross Metabolic - Weight loss or decreased weight gain	TDLo	220	mg/kg/7W continuous
96-45-7	Ethylene Thiourea (ETU)	Rat	Endocrine - Changes in thyroid weight Nutritional and Gross Metabolic - Weight loss or decreased weight gain	TDLo	900	mg/kg/8W continuous

CASNR	NAME	SPECIES	EFFECT	CRITERIUM	DOSE_CONC.	UNIT_DOSE_
96-45-7	Ethylene Thiourea (ETU)	Rat	Kidney, Ureter, and Bladder - Changes in kidney weight	TDLo	1800	mg/kg/8W continuous
96-45-7	Ethylene Thiourea (ETU)	Rat	Tumorigenic - Carcinogenic by RTECS criteria Endocrine - Thyroid tumors	TDLo	10920	mg/kg/2Y continuous
96-45-7	Ethylene Thiourea (ETU)	Rat	Liver - Changes in liver weight	TDLo	450	mg/kg/8W continuous
96-45-7	Ethylene Thiourea (ETU)	Rat	Specific Developmental Abnormalities - Central nervous system Effects on Newborn - Weaning or lactation index (e.g., # alive at weaning per # alive at day 4)	TDLo	30	mg/kg
96-45-7	Ethylene Thiourea (ETU)	Mouse	Effects on Fertility - Post-implantation mortality (e.g., dead and or resorbed implants per total number of implants) Effects on Embryo or Fetus - Fetal death Specific Developmental Abnormalities - Musculoskeletal system	TDLo	2	gm/kg
96-45-7	Ethylene Thiourea (ETU)	Mouse	Specific Developmental Abnormalities - Craniofacial (including nose and tongue)	TDLo	2	gm/kg
96-45-7	Ethylene Thiourea (ETU)	Mouse	Specific Developmental Abnormalities - Musculoskeletal system	TDLo	2	gm/kg
96-45-7	Ethylene Thiourea (ETU)	Rat	Tumorigenic - Neoplastic by RTECS criteria Endocrine - Thyroid tumors	TDLo	2737.5	mg/kg/1Y continuous
96-45-7	Ethylene Thiourea (ETU)	Rat	Specific Developmental Abnormalities - Central nervous system Specific Developmental Abnormalities - Craniofacial (including nose and tongue) Specific Developmental Abnormalities - Musculoskeletal system	TDLo	300	mg/kg
96-45-7	Ethylene Thiourea (ETU)	Mouse			2	gm/kg
96-45-7	Ethylene Thiourea (ETU)	Rat	Specific Developmental Abnormalities - Central nervous system Specific Developmental Abnormalities - Craniofacial (including nose and tongue) Specific Developmental Abnormalities - Musculoskeletal system	TDLo	100	mg/kg

CASNR	NAME	SPECIES	EFFECT	CRITERIUM	DOSE_CONC.	UNIT_DOSE_
96-45-7	Ethylene Thiourea (ETU)	Rat	Specific Developmental Abnormalities - Musculoskeletal system Specific Developmental Abnormalities - Homeostasis	TDLo	80	mg/kg
96-45-7	Ethylene Thiourea (ETU)	Rat	Effects on Embryo or Fetus - Fetotoxicity (except death, e.g., stunted fetus) Specific Developmental Abnormalities - Central nervous system Specific Developmental Abnormalities - Craniofacial (including nose and tongue)	TDLo	80	mg/kg
96-45-7	Ethylene Thiourea (ETU)	Rat	Effects on Newborn - Viability index (e.g., # alive at day 4 per # born alive) Effects on Newborn - Weaning or lactation index (e.g., # alive at weaning per # alive at day 4)	TDLo	10	mg/kg
96-45-7	Ethylene Thiourea (ETU)	Rat	Specific Developmental Abnormalities - Gastrointestinal system	TDLo	100	mg/kg
96-45-7	Ethylene Thiourea (ETU)	Rat	Effects on Embryo or Fetus - Fetotoxicity (except death, e.g., stunted fetus) Specific Developmental Abnormalities - Musculoskeletal system	TDLo	50	mg/kg
96-45-7	Ethylene Thiourea (ETU)	Mouse	Effects on Embryo or Fetus - Fetotoxicity (except death, e.g., stunted fetus)	TDLo	2400	mg/kg
96-45-7	Ethylene Thiourea (ETU)	Rat	Specific Developmental Abnormalities - Craniofacial (including nose and tongue)	TDLo	60	mg/kg
96-45-7	Ethylene Thiourea (ETU)	Mouse	Effects on Newborn - Sex ratio	TDLo	1600	mg/kg
96-45-7	Ethylene Thiourea (ETU)	Rat	Specific Developmental Abnormalities - Urogenital system	TDLo	60	mg/kg
96-45-7	Ethylene Thiourea (ETU)	Rat	Effects on Newborn - Viability index (e.g., # alive at day 4 per # born alive)	TDLo	30	mg/kg
96-45-7	Ethylene Thiourea (ETU)	Rat	Specific Developmental Abnormalities - Central nervous system Effects on Newborn - Weaning or lactation index (e.g., # alive at weaning per # alive at day 4)	TDLo	30	mg/kg
96-45-7	Ethylene Thiourea (ETU)	Rat	Effects on Newborn - Growth statistics (e.g., reduced weight gain)	TDLo	30	mg/kg

CASNR	NAME	SPECIES	EFFECT	CRITERIUM	DOSE_CONC.	UNIT_DOSE_
96-45-7	Ethylene Thiourea (ETU)	Rat	Effects on Fertility - Litter size (e.g., # fetuses per litter, measured before birth) Specific Developmental Abnormalities - Central nervous system Effects on Newborn - Viability index (e.g., # alive at day 4 per # born alive)	TDLo	30	mg/kg
96-45-7	Ethylene Thiourea (ETU)	Rat	Specific Developmental Abnormalities - Musculoskeletal system	TCLo	27200	ug/m3/3H
96-45-7	Ethylene Thiourea (ETU)	Rat	Effects on Embryo or Fetus - Fetotoxicity (except death, e.g., stunted fetus) Effects on Embryo or Fetus - Fetal death	TCLo	120	mg/m3/3H
96-45-7	Ethylene Thiourea (ETU)	Rabbit	Mild	DRAIZE reaction	500	mg/24H
96-45-7	Ethylene Thiourea (ETU)	Mouse		LD50	7800	mg/kg
96-45-7	Ethylene Thiourea (ETU)	Mouse		LD50	3	gm/kg
96-45-7	Ethylene Thiourea (ETU)	Mouse		LD50	200	mg/kg
96-45-7	Ethylene Thiourea (ETU)	Rat		LD50	1832	mg/kg
96-45-7	Ethylene Thiourea (ETU)	Rat	Endocrine - Other changes	TDLo	1000	mg/kg
96-45-7	Ethylene Thiourea (ETU)	Rat	Effects on Embryo or Fetus - Fetotoxicity (except death, e.g., stunted fetus)	TDLo	84	mg/kg
96-45-7	Ethylene Thiourea (ETU)	Yeast - S Cerevisiae			50	mg/L
96-45-7	Ethylene Thiourea (ETU)	Rat	Tumorigenic - Carcinogenic by RTECS criteria Endocrine - Thyroid tumors		11466	mg/kg/78W continuous
96-45-7	Ethylene Thiourea (ETU)	Rat	Tumorigenic - Equivocal tumorigenic agent by RTECS criteria Liver - Tumors		5470	mg/kg/26W continuous
96-45-7	Ethylene Thiourea (ETU)	Rat	Tumorigenic - Carcinogenic by RTECS criteria Endocrine - Tumors Endocrine - Thyroid tumors		9125	mg/kg/2Y continuous
96-45-7	Ethylene Thiourea (ETU)	Rat	Tumorigenic - Carcinogenic by RTECS criteria Endocrine - Thyroid tumors		146	gm/kg/2Y continuous
96-45-7	Ethylene Thiourea (ETU)	Rat	Tumorigenic - Carcinogenic by RTECS criteria Endocrine - Thyroid tumors Tumorigenic Effects - Testicular tumors		44	gm/kg/2Y continuous
96-45-7	Ethylene Thiourea (ETU)	Bacteria - E Coli			10	gm/L

CASNR	NAME	SPECIES	EFFECT	CRITERIUM	DOSE_CONC.	UNIT_DOSE_
96-45-7	Ethylene Thiourea (ETU)	Hamster			80	ug/L
96-45-7	Ethylene Thiourea (ETU)	Rat	Maternal Effects - Parturition Effects on Newborn - Stillbirth Effects on Newborn - Growth statistics (e.g., reduced weight gain)	TDLo	2800	mg/kg
96-45-7	Ethylene Thiourea (ETU)	Mold - A Nidulans			39200	umol/L
96-45-7	Ethylene Thiourea (ETU)	Rabbit	Effects on Fertility - Post-implantation mortality (e.g., dead and or resorbed implants per total number of implants)	TDLo	1120	mg/kg
96-45-7	Ethylene Thiourea (ETU)	Insects - D Melanogaster			500	umol/L
96-45-7	Ethylene Thiourea (ETU)	Mouse			6	gm/kg
96-45-7	Ethylene Thiourea (ETU)	Rat			200	mg/kg
96-45-7	Ethylene Thiourea (ETU)	Hamster	Specific Developmental Abnormalities - Central nervous system Specific Developmental Abnormalities - Craniofacial (including nose and tongue)	TDLo	1200	mg/kg
96-45-7	Ethylene Thiourea (ETU)	Mouse			1800	mg/L (+S9)
96-45-7	Ethylene Thiourea (ETU)	Bacteria - E Coli			500	mg/L
96-45-7	Ethylene Thiourea (ETU)	Rabbit	Specific Developmental Abnormalities - Central nervous system	TDLo	140	mg/kg
96-45-7	Ethylene Thiourea (ETU)	Hamster	Specific Developmental Abnormalities - Musculoskeletal system	TDLo	600	mg/kg
96-45-7	Ethylene Thiourea (ETU)	Cat	Specific Developmental Abnormalities - Eye, ear Specific Developmental Abnormalities - Body wall Specific Developmental Abnormalities - Craniofacial (including nose and tongue)	TDLo	600	mg/kg
96-45-7	Ethylene Thiourea (ETU)	Hamster	Specific Developmental Abnormalities - Craniofacial (including nose and tongue) Specific Developmental Abnormalities - Musculoskeletal system Specific Developmental Abnormalities - Gastrointestinal system	TDLo	6480	mg/kg
96-45-7	Ethylene Thiourea (ETU)	Hamster	Effects on Embryo or Fetus - Fetotoxicity (except death, e.g., stunted fetus)	TDLo	2160	mg/kg

CASNR	NAME	SPECIES	EFFECT	CRITERIUM	DOSE_CONC.	UNIT_DOSE_
96-45-7	Ethylene Thiourea (ETU)	Hamster	Effects on Fertility - Post-implantation mortality (e.g., dead and or resorbed implants per total number of implants) Effects on Embryo or Fetus - Fetal death	TDLo	2400	mg/kg

Table 5.6 Overview of wildlife relevant systemic toxicity data of category 1 substances

CASNR	NAME	Species Name	EFFECT	CRITERIUM	CONCENTRAT	UNIT_OF_CO
92-69-3	4-Hydroxybiphenyl = 4-Phenylphenol	Daphnia magna	Mortality	LC50	3.66	mg/l
92-69-3	4-Hydroxybiphenyl = 4-Phenylphenol	Tetrahymena pyriformis	Population Changes, General; Decrease	EC50	7.05	mg/l
92-69-3	4-Hydroxybiphenyl = 4-Phenylphenol	Daphnia magna	Mortality	LC50	3.66	mg/l
92-69-3	4-Hydroxybiphenyl = 4-Phenylphenol	Daphnia magna	Immobile	EC50	3.66	mg/l
1634-04-4	methyl tertiary butyl ether (MTBE)	Rana temporaria	Mortality; Increase	LC50	2500	mg/l
1634-04-4	methyl tertiary butyl ether (MTBE)	Alburnus alburnus	Mortality	LC50	1000	mg/l
1634-04-4	methyl tertiary butyl ether (MTBE)	Pimephales promelas	Mortality	LC50	672	mg/l
1634-04-4	methyl tertiary butyl ether (MTBE)	Nitocra spinipes	Mortality	LC50	1000	mg/l
1113-02-6	Omethoate	Daphnia magna	Immobile	EC50	0.021	mg/l
1113-02-6	Omethoate	Aphanius fasciatus	Mortality	LC50*	2.69	mg/l
1113-02-6	Omethoate	Artemia sp.	Mortality; Increase	EC50	25	mg/l
1113-02-6	Omethoate	Daphnia magna	Mortality	LC25	0.0038	mg/l
1113-02-6	Omethoate	Daphnia magna	Mortality	LC50	0.0042	mg/l
1113-02-6	Omethoate	Aphanius fasciatus	Mortality	LC50*	1.61	mg/l
1113-02-6	Omethoate	Aphanius fasciatus	Mortality	LC50*	1.51	mg/l
314-40-9	Bromacil	Scenedesmus subspicatus	Population Changes, General; Decrease	NOEC	0.045	mg/l
13593-03-8	Quinalphos = Chinalphos	Penaeus monodon	Mortality	LC50	0.000327	mg/l
13593-03-8	Quinalphos = Chinalphos	Penaeus monodon	Mortality	LC50	0.00064	mg/l
13593-03-8	Quinalphos = Chinalphos	Penaeus monodon	Mortality	LC50	0.000768	mg/l
13593-03-8	Quinalphos = Chinalphos	Penaeus monodon	Mortality	LC50	0.000514	mg/l
13593-03-8	Quinalphos = Chinalphos	Bellamya bengalensis	Mortality	LC50	0.0019	mg/l
13593-03-8	Quinalphos = Chinalphos	Penaeus monodon	Mortality	LC50	0.000313	mg/l

CASNR	NAME	Species Name	EFFECT	CRITERIUM	CONCENTRAT	UNIT_OF_CO
13593-03-8	Quinalphos = Chinalphos	Tilapia mossambica	Mortality; Increase	LC50	0.003	mg/l
13593-03-8	Quinalphos = Chinalphos	Penaeus monodon	Mortality	LC50	0.000124	mg/l
96-45-7	Ethylene Thiourea (ETU)	Poecilia reticulata	Mortality; Increase	LC50	7500	mg/l
96-45-7	Ethylene Thiourea (ETU)	Chlorella pyrenoidosa	Growth, General	EC50	6600	mg/l
96-45-7	Ethylene Thiourea (ETU)	Oncorhynchus mykiss	Multiple Effects Reported as One Result	LOEC	100	mg/l
96-45-7	Ethylene Thiourea (ETU)	Daphnia magna	Mortality	LC50	18	mg/l
96-45-7	Ethylene Thiourea (ETU)	Daphnia magna	Mortality	LC50	26.4	mg/l
96-45-7	Ethylene Thiourea (ETU)	Oncorhynchus mykiss	Growth, General	LOEC	100	mg/l
96-45-7	Ethylene Thiourea (ETU)	Microhyla ornata	Mortality	NOLC	5	mg/l
96-45-7	Ethylene Thiourea (ETU)	Oncorhynchus mykiss	Multiple Effects Reported as One Result	EC50	1000	mg/l
1582-09-8	Trifluralin	Mugil cephalus	Abnormal; Increase	NOEC	0.003	mg/l
1582-09-8	Trifluralin	Cyprinodon variegatus	Mortality	LC50-FT	190	ug/l
1582-09-8	Trifluralin	mallard duck	embryonic death, reduced growth, increased rate of bile formation and of stuntedness of the embryos			
1582-09-8	Trifluralin	Mugil cephalus	Abnormal; Increase	LOEC	0.005	mg/l
1582-09-8	Trifluralin	Oncorhynchus mykiss	Mortality; Increase	LC50	0.0135	mg/l
1582-09-8	Trifluralin	Rasbora heteromorpha	Mortality	LC50	0.00347	mg/l
1582-09-8	Trifluralin	Lepomis macrochirus	Mortality; Increase	LC50	0.01	mg/l
1582-09-8	Trifluralin	Oncorhynchus mykiss	Mortality	LC50	0.00025	mg/l
1582-09-8	Trifluralin	Daphnia magna	Mortality	NOLC	0.0072	mg/l
1582-09-8	Trifluralin	Pimephales promelas	Mortality	NOLC	0.0165	mg/l

CASNR	NAME	Species Name	EFFECT	CRITERIUM	CONCENTRAT	UNIT_OF_CO
92-88-6	4,4'-Dihydroxybiphenyl = 4,4'-Biphenol	Tetrahymena thermophila	Population Changes, General	EC50	11.5	mg/l
92-88-6	4,4'-Dihydroxybiphenyl = 4,4'-Biphenol	Tetrahymena thermophila	Chemical Avoidance; Increase	EC10	9	mg/l
92-88-6	4,4'-Dihydroxybiphenyl = 4,4'-Biphenol	Tetrahymena thermophila	Population Changes, General	NOEC	1	mg/l
92-88-6	4,4'-Dihydroxybiphenyl = 4,4'-Biphenol	Tetrahymena thermophila	Chemical Avoidance; NEF	EC0	7.5	mg/l
92-88-6	4,4'-Dihydroxybiphenyl = 4,4'-Biphenol	Tetrahymena thermophila	Biomass; Includes Harvest Yield, Fruit or Seed Yield, Mass of Organism, Mass of Population.	EC20	6.9	mg/l
104-40-5	4-Nonylphenol (4-NP)	Salmo salar	Mortality	LC50	0.19	mg/l
104-40-5	4-Nonylphenol (4-NP)	Pimephales promelas	Mortality	LC50	0.14	mg/l
104-40-5	4-Nonylphenol (4-NP)	Salmo salar	Mortality	LC50	0.13	mg/l
104-40-5	4-Nonylphenol (4-NP)	Chironomus tentans	Mortality; Increase	NOEC	0.042	mg/l
104-40-5	4-Nonylphenol (4-NP)	Daphnia magna	Mortality	NOLC	0.0062	mg/l
104-40-5	4-Nonylphenol (4-NP)	Pimephales promelas	Lesions; Increase	LOEC	0.0019	mg/l
104-40-5	4-Nonylphenol (4-NP)	Salmo salar	Mortality	LC50	0.16	mg/l
25013-16-5	tert.-Butylhydroxyanisole (BHA)	Dreissena polymorpha	Ability to Detach from Substrate; Increase	EC50	3.4	mg/l
25013-16-5	tert.-Butylhydroxyanisole (BHA)	Oryzias latipes	Mortality	LC50	2.5	mg/l
25013-16-5	tert.-Butylhydroxyanisole (BHA)	Ictalurus punctatus	Mortality; Increase	LC50	1.5	mg/l
25013-16-5	tert.-Butylhydroxyanisole (BHA)	Oncorhynchus mykiss	Mortality; Increase	LC50	1	mg/l
25013-16-5	tert.-Butylhydroxyanisole (BHA)	Oryzias latipes	Mortality	LC50	5.6	mg/l
25013-16-5	tert.-Butylhydroxyanisole (BHA)	Oryzias latipes	Mortality	LC50	2.5	mg/l
25013-16-5	tert.-Butylhydroxyanisole (BHA)	Oryzias latipes	Mortality	LC50	5.5	mg/l
4376-20-9	Mono 2 ethyl hexylphthalate (MEHP)	Chironomus plumosus	Immobile	EC50	72	mg/l
4376-20-9	Mono 2 ethyl hexylphthalate (MEHP)	Chironomus plumosus	Mortality; Increase	LC50	72	mg/l

CASNR	NAME	Species Name	EFFECT	CRITERIUM	CONCENTRAT	UNIT_OF_CO
4376-20-9	Mono 2 ethyl hexylphthalate (MEHP)	Chironomus plumosus	Immobile; Increase	EC50	72	mg/l
7400-08-0	p-Coumaric acid (PCA)	Selenastrum capricornutum	Population Changes, General; Decrease	LOEC	164.16	mg/l
6164-98-3	Chlordimeform	Oncorhynchus mykiss	Mortality; Increase	LC50	29	mg/l
6164-98-3	Chlordimeform	Ictalurus punc-tatus	Mortality; Increase	LC50	20.2	mg/l
6164-98-3	Chlordimeform	Oncorhynchus mykiss	Mortality; Increase	LC50	29	mg/l
6164-98-3	Chlordimeform	Oncorhynchus mykiss	Mortality; Increase	LC50	13.2	mg/l
6164-98-3	Chlordimeform	Ictalurus punc-tatus	Mortality; Increase	LC50	20.7	mg/l
6164-98-3	Chlordimeform	Oncorhynchus mykiss	Mortality; Increase	LC50	13.2	mg/l
6164-98-3	Chlordimeform	Oncorhynchus mykiss	Mortality	LC50	13.2	mg/l
96-12-8	Dibromochloropropane (DBCP)	Indoplanorbis exustus	Mortality	LC50	57	mg/l
96-12-8	Dibromochloropropane (DBCP)	Cipangopaludina malleata	Mortality	LC50	53	mg/l
96-12-8	Dibromochloropropane (DBCP)	Semisulcospira libertina	Mortality	LC50	50	mg/l
96-12-8	Dibromochloropropane (DBCP)	Physella acuta	Mortality	LC50	24	mg/l

5.3.2 Evaluation of exposure of humans and wildlife (Task 3.3)

Monitoring data for CAT 1 and CAT 2 substance has been searched in the COMMPS database/EEA. However, since COMMPS included monitoring data for only a few CAT 1 and CAT 2 substances (5 substances) it has been decided not to include these in the present project.

Evaluation of the exposure of the environment has thus in the present project been based on the PC program EUSES.

EUSES summary report for CAT 1 and CAT 2 substance are now included in the EDC database. Selected EUSES data (release to the environment, distribution and concentration in water, sediment and soil, second poising in fish and top predators, and human intake) are included in datasheet of the CAT 1 substances and based on an evaluation of the results of the EUSES calculations together with an evaluation of the use category (e.g. cosmetic, pesticide etc.) a subjective evaluation of exposure concern (high, medium, low) was performed. E.g. if a substance turned out to be ready biodegradable, but used in cosmetics a relative high human exposure can be foreseen and the substance is rated as 'high concern'. It shall be clearly emphasised that the exposure evaluation is not a risk assessment and that the choices for the categorisation (high, medium, low concern) has solely been made by the consultant.

An overview of selected EUSES data for CAT 1 substances is presented in Table 5.5 and Figures 5.1-5.6 below.

Table 5.5 Overview of selected EUSES data for CAT 1 substances

CAS No.	Chemical name	Tonnage of substance used in EUSES calculations	Total release to environment (% of use)	Release to air	Release to waste water	Local PEC in surface water during emission episode (dissolved)	Local PEC in fresh water sediment during emission episode	Concentration in fish for secondary poisoning (fresh water)	Concentration in fish-eating marine top-predators	Local total daily intake for humans	Regional total daily intake for humans
		[tonnes.yr-1]	(%)	[kg.year-1]	[kg.year-1]	[mg.l-1]	[mg.kgwwt-1]	[mg.kgwwt-1]	[mg.kgwwt-1]	[mg.kg-1.d-1]	[mg.kg-1.d-1]
10043-35-3	Boric acid	50000	0.2	375.0	112500	2.4	2.1	1.4	0.2	6.7E-02	1.6E-05
104-40-5	Phenol, 4-nonyl-	10	2.0	0.1	200	4.3	979.0	933.0	424.0	2.5E+02	1.6E-04
1113-02-6	Omethoate	500	1.5	3.8	7500	2.5	2.2	0.7	0.0	3.6E-02	1.0E-05
1131-60-8	Phenol, 4-cyclohexyl-	10	2.0	0.1	200	8.3	302.0	8.8	0.2	1.7E+01	9.6E-06
120-47-8	Benzoic acid, 4-hydroxy-, ethyl ester	50	2.0	0.5	999	0.0	0.1	0.2	0.0	1.8E-03	2.3E-07
131-18-0	1,2-Benzenedicarboxylic acid, dipentyl	50	1.6	0.4	799	0.4	66.9	1550.0	1290.0	1.5E+01	7.7E-05
131-55-5	Methanone, bis(2,4-dihydroxyphenyl)-	50	2.0	0.5	1000	9.6	68.8	3.0	0.1	4.1E+00	4.1E-06
131-56-6	Methanone, (2,4-dihydroxyphenyl)phenyl-	50	5.9	1.1	2970	5.2	45.4	12.7	0.3	2.3E+00	1.1E-05
131-70-4	1,2-Benzenedicarboxylic acid, monobutyl	10	2.0	0.1	200	1.2	9.4	0.1	0.0	6.3E-02	7.5E-08
13593-03-8	Diethquinalphion	500	1.5	3.8	7500	2.0	93.1	482.0	12.2	8.0E+00	8.2E-04
15087-24-8	Bicyclo[2.2.1]heptan-2-one, 1,7,7-trime	50	2.0	0.5	1000	7.2	445.0	183.0	10.2	3.8E+01	7.0E-05
1582-09-8	Benzoic acid, 4-hydroxy-, ethyl ester	10000	0.2	80.1	24000	2.0	270.0	56000.0	22500.0	6.4E+01	8.0E-03

CAS No.	Chemical name	Tonnage of substance used in EUSES calculations	Total release to environment (% of use)	Release to air	Release to waste water	Local PEC in surface water during emission episode (dissolved)	Local PEC in fresh water sediment during emission episode	Concentration in fish for secondary poisoning (fresh water)	Concentration in fish-eating marine top-predators	Local total daily intake for humans	Regional total daily intake for humans
		[tonnes.yr-1]	(%)	[kg.year-1]	[kg.year-1]	[mg.l-1]	[mg.kgwwt-1]	[mg.kgwwt-1]	[mg.kgwwt-1]	[mg.kg-1.d-1]	[mg.kg-1.d-1]
1634-04-4	Propane, 2-methoxy-2-methyl-	50000	2.7	1251000.0	75000	4.7	7.5	3.1	0.2	4.0E-01	4.1E-05
25013-16-5	Phenol, (1,1-dimethylethyl)-4-methoxy-	500	1.5	3.8	7500	2.3	29.1	59.8	1.3	8.3E-01	6.3E-05
27193-28-8	Phenol, (1,1,3,3-tetramethylbutyl)-	10	2.0	0.1	200	5.2	860.0	672.0	256.0	1.7E+02	1.1E-04
33204-76-1	Cyclotetrasiloxane, 2,2,4,6,6,8-hexamet	10	2.0	0.1	200	0.4	727.0	202.0	913.0	2.7E+02	1.1E-03
36861-47-9	Rigtig	50	1.6	0.4	799	0.9	102.0	1730.0	594.0	1.6E+01	2.4E-04
4376-20-9	Mono(2-ethylhexyl)phthalate	10	2.0	0.1	200	7.3	483.0	41.8	2.3	4.4E+01	2.9E-05
50-18-0	Cyclophosphamide	10	1.8	0.1	180	1.0	1.3	0.0	0.0	4.4E-02	2.1E-07
5466-77-3	2-Propenoic acid, 3-(4-methoxyphenyl)-,	5000	0.0	5.0	15000	1.1	251.0	73900.0	34400.0	8.9E+01	1.3E-02
556-67-2	Octamethyltetrasiloxane	50000	0.8	300000.0	90000	0.7	31.4	328.0	149.0	1.2E+00	3.8E-04
611-99-4	Unknown	10	1.8	0.1	180	1.0	3.9	0.2	0.0	3.4E-01	4.4E-07
6164-98-3	Chlordimeform	10	1.8	0.1	180	1.0	7.7	0.7	0.0	1.3E-01	7.5E-07
7400-08-0	2-Propenoic acid, 3-(4-hydroxyphenyl)-	10	2.0	0.1	200	1.3	3.4	0.0	0.0	1.3E-01	2.9E-08

CAS No.	Chemical name	Tonnage of substance used in EUSES calculations	Total release to environment (% of use)	Release to air	Release to waste water	Local PEC in surface water during emission episode (dissolved)	Local PEC in fresh water sediment during emission episode	Concentration in fish for secondary poisoning (fresh water)	Concentration in fish-eating marine top-predators	Local total daily intake for humans	Regional total daily intake for humans
		[tonnes.yr-1]	(%)	[kg.year-1]	[kg.year-1]	[mg.l-1]	[mg.kgwwt-1]	[mg.kgwwt-1]	[mg.kgwwt-1]	[mg.kg-1.d-1]	[mg.kg-1.d-1]
77-09-8	1(3H)-Isobenzofuranone, 3,3-bis(4-hydro	10	2.0	0.1	200	9.5	91.9	1.0	0.0	4.3E+00	1.2E-06
77-40-7	2,2-bis(4-hydroxyphenyl)butane	10	1.8	0.09	180	0.738	46.7	35.2	1.9	4.2E+00	2.9E-05
92-69-3	1,1'-Biphenyl -4-ol	1000	2.4	30.0	24000	3.8	42.5	162.0	3.4	2.2E+00	7.5E-05
92-88-6	1,1'-Biphenyl -4,4'-diol	10	1.8	0.1	180	1.0	7.0	0.6	0.0	4.1E-01	8.5E-07
94-13-3	Benzoic acid, 4-hydroxy-, propyl ester	10	2.0	0.1	200	9.5	90.0	1.0	0.0	2.1E+00	1.1E-06
94-26-8	Benzoic acid, 4-hydroxy-, butyl ester	10	2.0	0.1	200	1.2	20.4	0.4	0.1	1.1E-01	2.5E-07
96-12-8	Propane, 1,2-dibromo-3-chloro-	10	1.9	9.0	180	0.8	6.6	0.6	0.0	4.1E-02	1.8E-07
96-45-7	2-Imidazolidinethione	1000	0.3	10.0	3000	0.5	0.4	0.3	0.0	1.4E-02	3.1E-06
99-76-3		500	2.0	5.0	10000	1.3	4.0	0.8	0.1	2.8E-02	1.5E-06
99-96-7	Benzoic acid, 4-hydroxy-	1000	0.3	10.0	3000	0.1	0.1	0.1	0.0	8.6E-03	4.2E-07

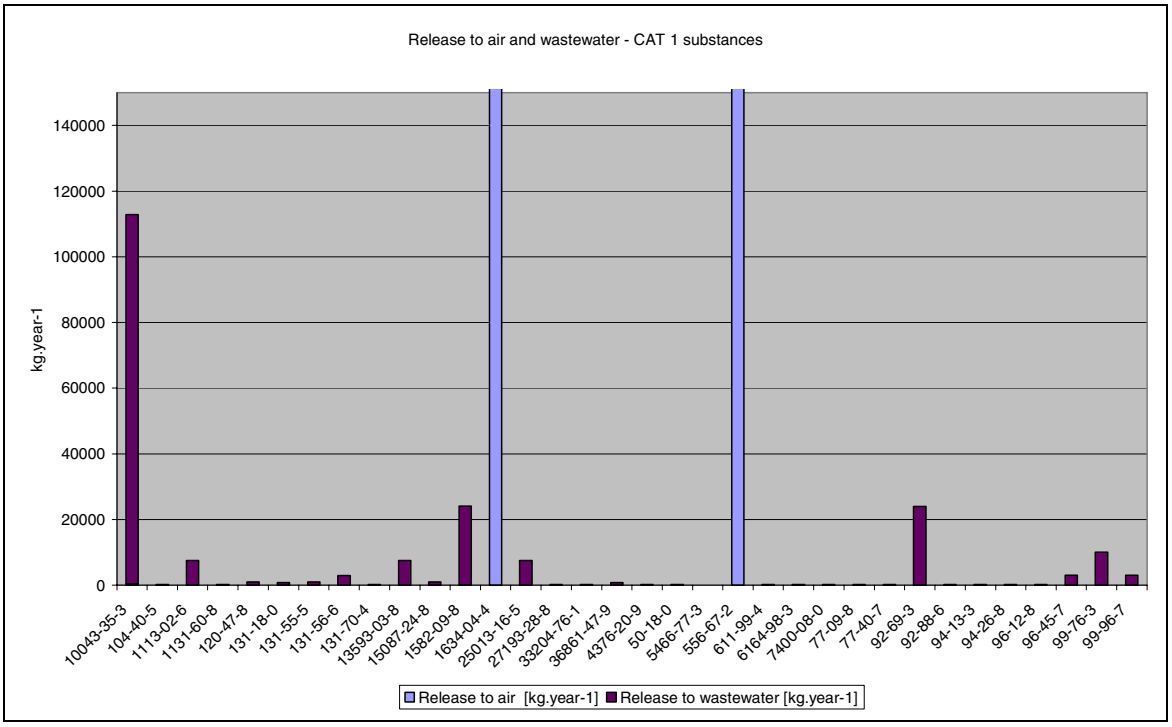

Figure 5.1 Release to the environment by air and wastewater. The magnitude of release is dependent on the production tonnage, the use pattern, and the physico-chemical properties of the substances.

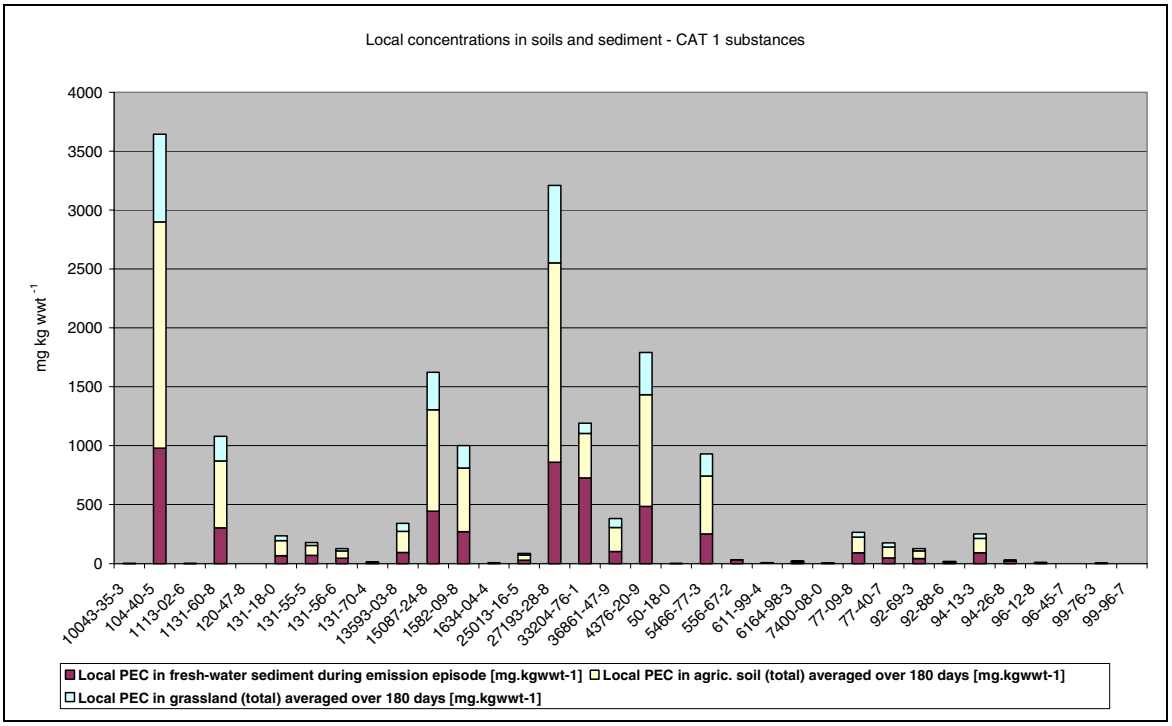

Figure 5.2 Local concentration in soils (agricultural soil and grassland) and sediments

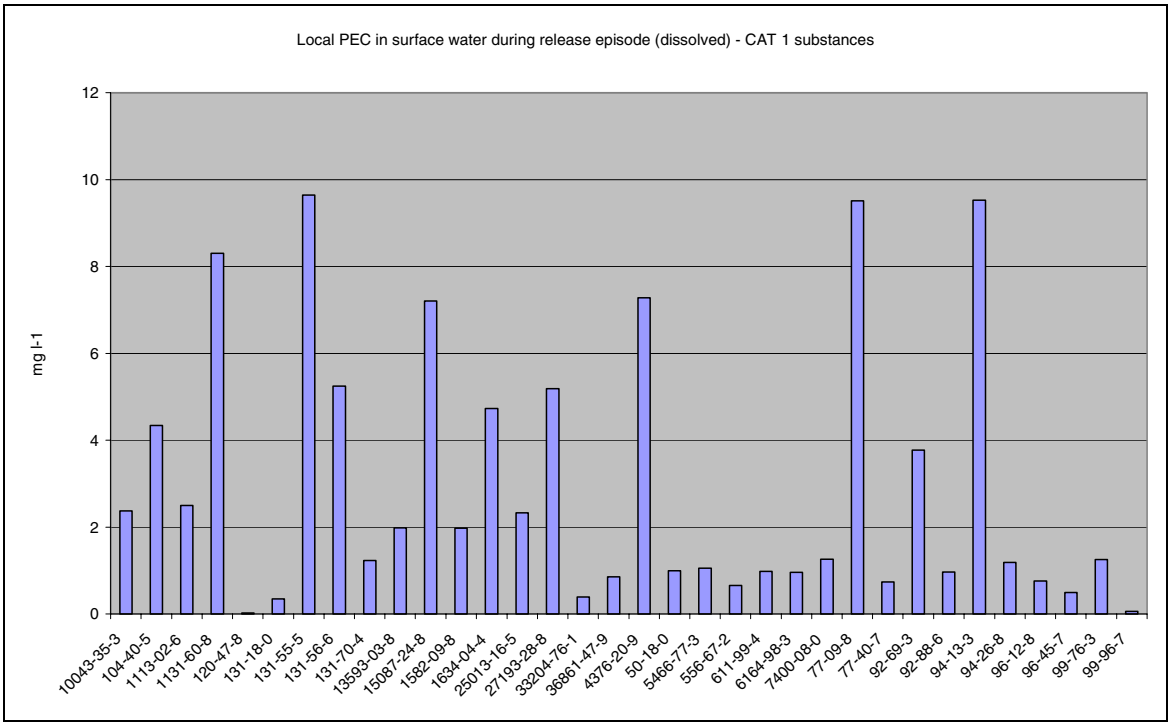

Figure 5.3 Local concentration in surface water

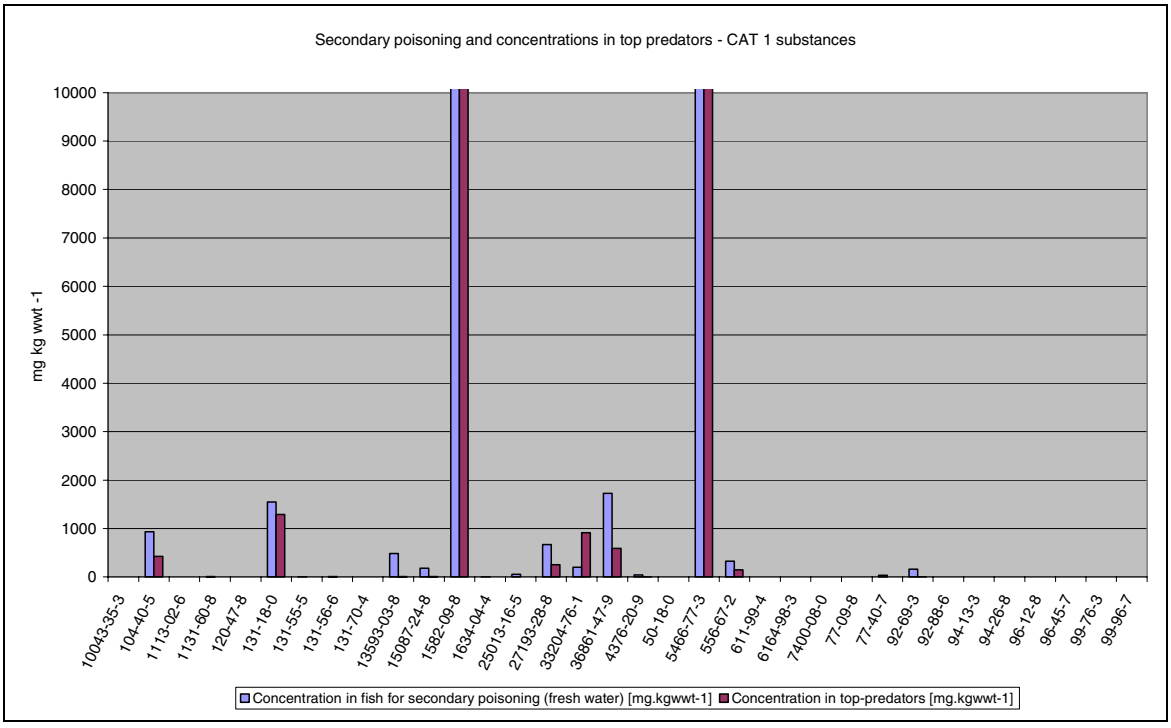

Figure 5.4 Secondary poisoning and concentration in top predators. Furthermore, considerable concentrations are found for 5-6 more substances.

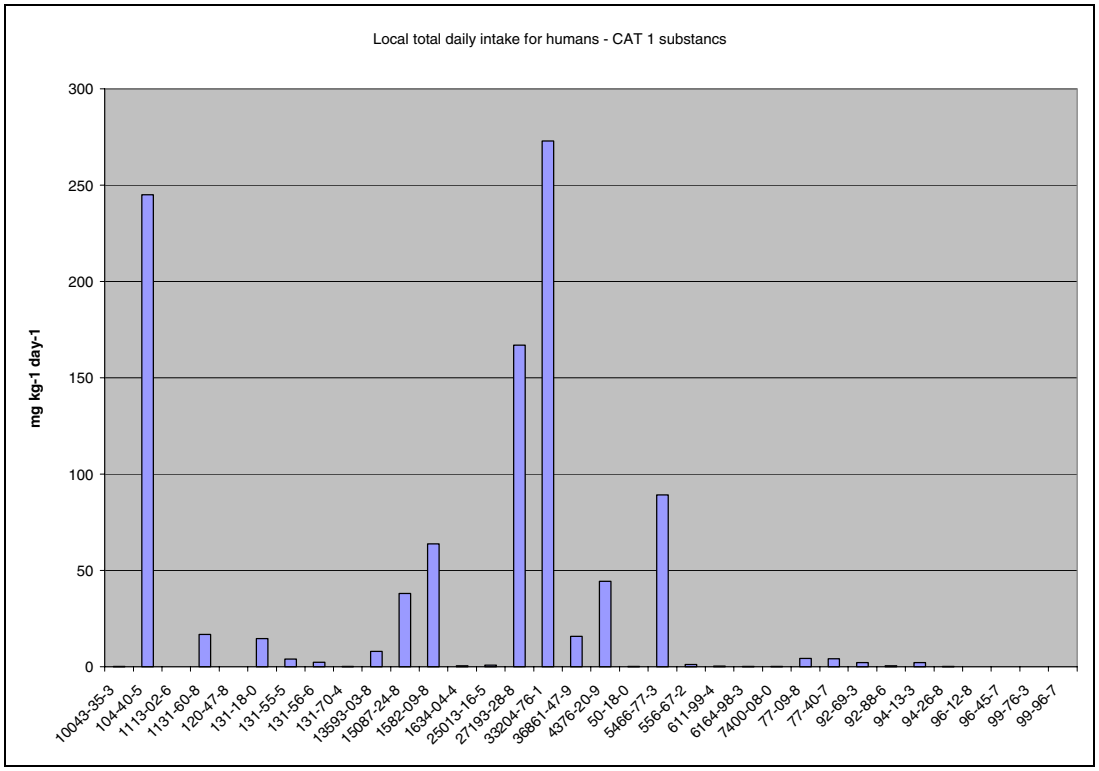

Figure 5.5 Estimated values for local total daily intake for humans

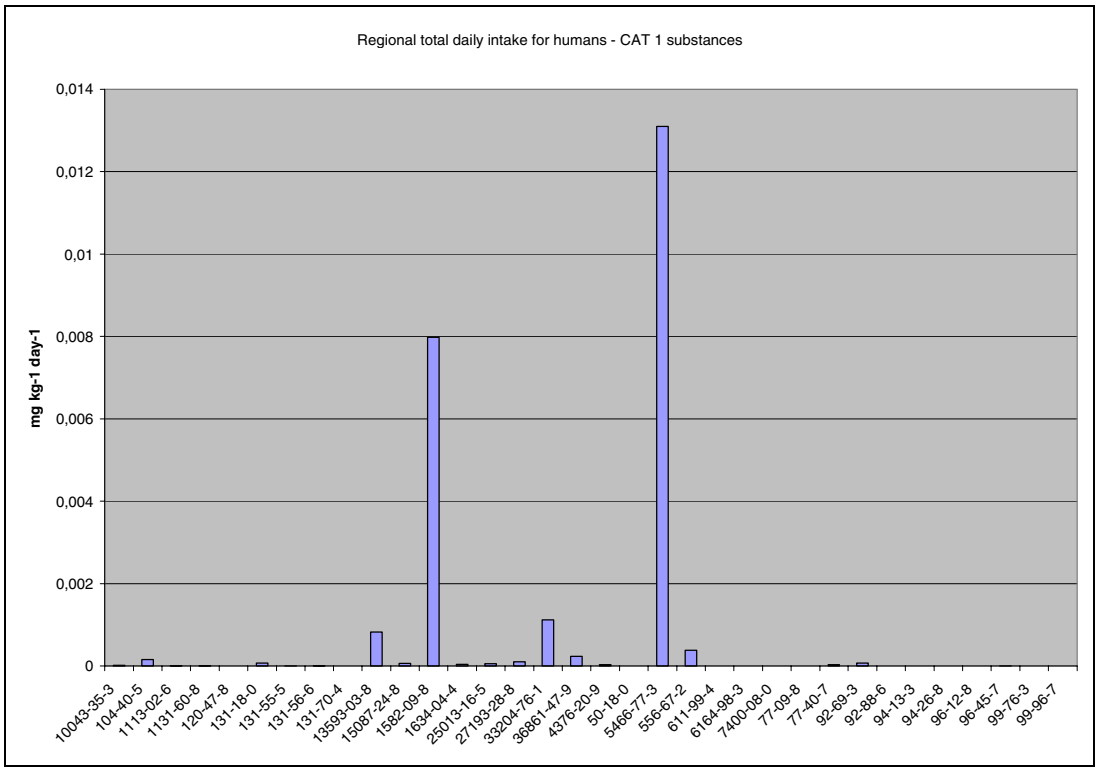

Figure 5.6 Estimated values for regional total daily intake for humans

The magnitude of release is dependent on the tonnage, the use pattern, and the physico-chemical properties of the substances. As indicated in the figures, large differences are seen in release of CAT 1 substances, from less than 1 kg/year and up to more than 1,300,000 kg/year. In average, 1.8% of the tonnage used is estimated to be released to the environment with a variability between 0-6% of the tonnage used.

The EUSES estimations indicated an accumulation of substances in sediments and soils for about half of the CAT 1 substances. The concentration of CAT 1 substances in surface waters may be up to 10 mg/l although, for about half of the substances, a concentration of $\leq$ 1 mg/L was found.

For secondary poisoning and concentration in top predators, EUSES estimations indicated very high concentration, up to 7,400 mg/kg wwt for two substances (CAS Nos. 1582-09-8 and 5466-77-3). Furthermore, considerable concentrations were found for 5-6 other substances.

Estimations for human intake of substances via the environment depict considerable intake of about one third of the CAT 1 substance (local human intake).

In Table 5.8, an overview of the human health relevant effect data for Category 1 substances in comparison with EUSES estimated local and regional intake via the environment is presented. In Table 5.9, an overview of wildlife relevant effect data for Category 1 substances in comparison with EUSES estimated local surface water concentrations is presented.

Table 5.8 Output from database: Overview of the human health relevant ED effect data of Category 1 substances. Plus EUSES estimated data on human intake (for abreviasions see Annex 1)

CAS NO	NAME	SPECIES	Qualifying remarks_HH	CRITERION	DOSE CONC.	UNIT_DOS	REC NO	Local total daily intake for humans (mg/kg/day)	Regional total daily intake for humans (mg/kg/day)
10043-35-3	Boric acid	Wistar rats	Rat in vivo study: After a 4-wk administration by gavage, testis and epididymis wts. were decreased in the 300 and 500 mg/kg groups.	LOAEL	300	mg/kg body weight. day	GPh131yr06	0.067000002	1.63E-05
104-40-5	4-Nonylphenol (4-NP)	rats. uterotrophic assay	Rat in vivo study: Uterine weight, uterine/body weight significantly increased in 90 mg/kg and 120 mg/kg groups and a dose-response relationship was observed.	LOAEL	90	mg/kg	GPh144yr06	245	0.000157
1113-02-6	Omethoate	Kunming male mice	Mice in vivo study: Increase in body wt. and decreased testicle wt. The activities of AKP, ACP, LDH in mouse testicles significantly increased compared with the control.	ED	1, 2 and 4	mg/kg	GPh043yr06	0.035999998	1.02E-05
1131-60-8	4-Cyclohexylphenol	Rat	Rat in vivo study: Uterotrophic assay. Increased uterine weight. LOAEL=200 mg/kg.	LOEL	200	mg/kg	TTh031yr06	16.70000076	9.63E-06
120-47-8	ethyl 4-hydroxybenzoate	CD1 mice and Wistar rats	Rat and mice in vivo study: Increased uterine weight in immature and ovariectomized animals. ED50 18-74 µmol/ kg body weight.	ED50	18 to 74	µmol/ kg body weight	GPh110yr06	0.00177	2.33E-07
131-18-0	Di-n-pentylphthalate (DPP) = Dipentylphthalate	Mice	Mice in vivo study: A continuous breeding protocol was utilized to examine the reproductive toxicity of di-n-pentyl phthalate (DPP). DPP was toxic to the reproductive system as evidenced by a complete inhibition of fertility at 1.25 and 2.5% DPP and reduced fertility.	LOAEL	1.25	%	GPh012yr06	14.69999981	7.74E-05

CAS NO	NAME	SPECIES	Qualifying remarks_HH	CRITERION	DOSE CONC.	UNIT_DOS	REC NO	Local total daily intake for humans (mg/kg/day)	Regional total daily intake for humans (mg/kg/day)
131-55-5	Benzophenone-2 (Bp-2), 2,2',4,4'-tetrahydroxybenzophenone	rat	Rat in vivo study: Increased rat uterine weights. ED10=544.6 mg/kg body weight/day.	ED10	544.6	mg/kg body weight. day	GPh123yr06	4.070000172	4.13E-06
131-56-6	2,4-Dihydroxybenzophenon = Resbenzophenone	Long Evans rats	Rat in vivo study: Benzophenone (Bp)-1 increased uterine wt. in immature rats. Furthermore, benzophenone-1 (Bp-1) was in a previous in vitro experiment (MCF-7 cells) shown to have clear estrogenic activity (EC-50: 2.08 uM)	ED50	2-1200	mg/kg body weight	GPh026yr06	2.319999933	1.05E-05
131-70-4	Mono-n-butylphthalate	Wistar rats	Rat in vivo study: Decreased male anogenital distance and increased incidence of fetuses with undescended testes. LOAEL=250 mg/kg body weight/day	LOAEL	250	mg/kg body weight. day	GPh206yr06	0.063100003	7.52E-08
13593-03-8	Quinalphos = Chinalphos	Adult male rats	In vivo rat study: Sublethal chronic administration of quinalphos resulted in: decreased testicular mass and AChE activity in central as well as peripheral organs; increased serum LH, FSH, prolactin, and testosterone concns.; decreased pituitary or increased testicular ACE. Ed 7-14 mg/kg/day.	ED	7-14	mg/kg/day	GPh050yr06	7.96999979	0.000822
15087-24-8	3-Benzylidene camphor (3-BC)	Rat uterotrophic assay	Rat in vivo study: Increase in uterus weight. LOED = 2 mg/kg body weight.day	LOED	2	mg/kg body weight.day	GPh120yr06	38	6.95E-05

CAS NO	NAME	SPECIES	Qualifying remarks_HH	CRITERION	DOSE CONC.	UNIT_DOS	REC NO	Local total daily intake for humans (mg/kg/day)	Regional total daily intake for humans (mg/kg/day)
1582-09-8	Trifluralin	Ewes	In vivo ewe study. Concentrations of estradiol were significantly increased in ewes given trifluralin. No effect on thyroxine concentration. Mean serum concentrations of LH were markedly decreased by trifluralin, and basal LH concentrations were significantly decreased. Only one dosis (17.5 mg/kg 2 times per week) was investigated	LOEC	17.5	mg/kg body weight	GPh136yr06	63.90000153	0.00798
1634-04-4	methyl tertiary butyl ether (MTBE)	Sprague-Dawley rats	Rat in vio study: Increase of testis weight. Interstitial fluid and serum testosterone levels as well as serum prolactin levels were decreased only in animals treated with 1500 mg MTBE/kg/day for 15 days.	LOEC	1500	mg/kg/day	GPh032yr06	0.395000011	4.1E-05
25013-16-5	tert.-Butylhydroxyanisole (BHA)	rats (one-generation reproduction study)	In vivo rat study. In one-generation rats, sex ratio of male was decreased and the anogenital distances were shortened and vaginal patency and preputial separation were observed later than control group. Also, BHA decreased sperm motility and number and the width and length. LOEL=10 mg/kg body weight/day	LOAEL	10	mg/kg body weight. day	GPh190yr06	0.833999991	6.33E-05
27193-28-8	Phenol, (1,1,3,3-tetramethylbutyl)- = Octylphenol	male Wistar rats	Rat in vivo study. Reduced sperm counts resulting from lowered plasma testosterone in male rats just after puberty. ED=3 mg/kg body weight.day	ED	3	mg/kg body weight.day	GPh171yr06	167	0.000107

CAS NO	NAME	SPECIES	Qualifying remarks_HH	CRITERION	DOSE CONC.	UNIT_DOS	REC NO	Local total daily intake for humans (mg/kg/day)	Regional total daily intake for humans (mg/kg/day)
33204-76-1	2,6-cis-Diphenyl-hexamethyl-cyclotetrasiloxane - 2,6-cis-[(PhMeSiO)2(Me2SiO)2][	Rat	In vivo rat study. Inhibited fertility and alterations in measured characteristics of the ejaculate. LOAEL=0.5 mg/kg/day	LOAEL	0.5	mg/kg/day	GPh210yr06	273	0.00112
36861-47-9	3-(4-Methylbenzylidene)camphor	Long Evans (LE) rats.	Rat in vivo study. Delayed male puberty, and dose-dependently affected reproductive organ wts. of adult male and female F1 offspring, with partly different effect patterns. Thyroid wt. was increased by higher 4-MBC doses. LOAEL=7 mg/kg/day	LOAEL	7	mg/kg.day	GPh091yr06	15.69999981	0.000237
4376-20-9	Mono 2 ethyl hexylphthalate (MEHP)	5-week old male rats Sprague-Dawley rats	Rat in vivo study. Significantly decreased body weights and motile sperms. LOAEL=250 mg/kg body weight/day	LOAEL	250	mg/kg body weight. day	GPh202yr06	44.29999924	2.94E-05
50-18-0	Cyclophosphamide	Rat	Rat in vivo assay: Decreased ovarian and uterin weight and reduction serum estradiol and progesterone. LOAEL=50 mg/kg body weight	LOEL	50	mg/kg body weight	CGh514	0.043499999	2.12E-07
5466-77-3	2-ethyl-hexyl-4-methoxycinnamate	immature Long-Evans rats	Rat in vivo assay. Uterine wt. was dose-dependently increased by OMC (ED50 935 mg/kg/day)	ED50	935	mg/kg body-weight.day	GPh084yr06	89.19999695	0.0131

CAS NO	NAME	SPECIES	Qualifying remarks_HH	CRITERION	DOSE CONC.	UNIT_DOS	REC NO	Local total daily intake for humans (mg/kg/day)	Regional total daily intake for humans (mg/kg/day)
556-67-2	Cyclotetrasiloxane	Sprague-Dawley (SD) and Fischer 344 (F-344) rats	Rat in vivo assay. Uterotrophic assay with two species: Relative uterine wts. and uterine epithelial cell height were statistically significantly increased in both strains of rats at doses above 100 mg/kg/day. LOAEL=250 mg/kg/day	LOAEL	250	mg/kg/day	GPh063yr06	1.149999976	0.000384
611-99-4	4,4'-Dihydroxybenzophenon	immature rat uterotrophic assay + Hershberger assay	rat in vivo assay: Induced uterotrophy and exerted both estrogen agonistic effect and reduced the estrogenic effect of ethynylestradiol		See remarks		GPh227yr06	0.344000012	4.36E-07
6164-98-3	Chlordimeform	female rat	In vivo rat study. Delay in breeding and a significant redn. in litter size. ED=50 mg/kg.	ED	50	mg/kg	GPh253yr06	0.134000003	7.53E-07
7400-08-0	p-Coumaric acid (PCA)	Wistar albino rats	Rat in vivo assay: 189 and 201% thyroid wts increase compared to control value. hyroid lesions in p-coumaric acid group were assocd. with significant increases in cellular proliferation as indicated by [3H]thymidine incorporation. In addn., the goitrogenic effect of p-coumaric acid was further confirmed by significant decreases (50%) in serum triiodothyronine (T3) and thyroxine (T4), and a parallel increase (90%) in serum TSH compared to control group. ED=0.25 mmol/kg/day	ED	0.25	mmol/kg/day	GPh238yr06	0.130999997	2.91E-08
77-09-8	3,3'-Bis(4-hydroxyphenyl)phthalid = Phenolphthaleine	F344/N rats and B6C3F mice	Rat and mice in vivo study. Exposure of mice to phenolphthalein in feed for 2 years resulted in increased incidences of atypical hyperplasia of the thymus in males and females, degeneration of the germinal epithelium of the testis in males, and ovarian hyperplasia in females. LOAEL=300 mg/kg	LOAEL	300	mg/kg	GPh229yr06	4.269999981	1.22E-06

CAS NO	NAME	SPECIES	Qualifying remarks_HH	CRITERION	DOSE CONC.	UNIT_DOS	REC NO	Local total daily intake for humans (mg/kg/day)	Regional total daily intake for humans (mg/kg/day)
77-40-7	2,2-Bis(4-hydroxy-phenyl)-n-butan = Bisphenol B	immature rat utero-trophic assay	In vivo immature rat uterotrophic assay: Positive response in the uterotrophic assay. Dose reponse relationship (0, 2, 20 and 200 mg/kg)	See remarks	0, 2, 20 and 200	mg/kg	GPh223yr06	4.179999828	2.94E-05
92-69-3	4-Hydroxybi-phenyl = 4-Phenylphenol	Sprague-Dawley female rats	Rat in vivo assay: Uterotrophic assay and Calbindin-D9k (CaBP-9K) mRNA expression were examd. in ovariec-tomized Sprague-Dawley female rats. 4-phenylphenol produced dose-dependent (10, 50, 200, and 400 mg/kg/day(increases in the uterine wts. of ovariectomized rats). LOAEL=200 mg/kg/day	LOAEL	200	mg/kg/day	GP002hyr06	2.160000086	7.51E-05
92-88-6	4,4'-Dihydroxybi-phenyl = 4,4'-Biphenol	Rat	Rat in vivo study. Rat uterotrophic as-say. Uterine weight increase. LO-AEL=60 mg/kg body weight/day.	LOEL	60	mg/kg body weight. day	TTh028yr06	0.409000009	8.48E-07
94-13-3	n-propyl p-hydroxyben-zoate	3.week-old rats	In vivo rat assay: The epididymal sperm reserves and concentrations decreased dose dependently and the difference was significant at doses of 0.1% and above. LOAEL=0.1%	LOEC	0.1	%	GPh114yr06	2.079999924	1.06E-06
94-26-8	n-Butyl p-Hydroxyben-zoate	Mice	In vivo mice study. A dose-dependent decrease of both round and elongated spermatid ounts in stages VII-VIII seminiferous tubules was observed, and the elongated spermatid counts were significantly lower in all of the treated groups. The serum testosterone concentration decreased in a dose-dependent fashion and was significant at 1.00%. LOAEL=1504 mg/kg body weight. Day	LOAEL	1504	mg/kg body weight. day	GPh272yr06	0.104999997	2.46E-07

CAS NO	NAME	SPECIES	Qualifying remarks_HH	CRITERION	DOSE CONC.	UNIT_DOS	REC NO	Local total daily intake for humans (mg/kg/day)	Regional total daily intake for humans (mg/kg/day)
96-12-8	Dibromo-chloropropane (DBCP)	Human	Exposed human workers. Azoospermia oligospermia and dose-dependent change in FSH, LH and testicle size				GFh009	0.041299999	1.77E-07
96-45-7	Ethylene Thiourea (ETU)	rat	In vivo rat assay: Alteration in thyroid function and a significant change in thyroid morphol (125 and 625 ppm) . NOEC = 25 ppm	NOEC	0, 1, 58, 125, or 625	ppm	GPh055yr06	0.0143	3.12E-06
99-76-3	Methyl p-Hydroxyben-zoate	adult ova-riec-tomized (Ovx) CD1 mice	In vivo mice assay: The highest MeP-ben dose (165 mg/kg) was able to pro-duce uterotrophic effects (38 to 76%) compared to E-2 efects (100%). LO-AEL=165 mg/kg	LOAEL	165	mg/kg	GPh103yr06	0.0276	1.45E-06
99-96-7	p-Hydroxyben-zoic acid	Immature and adult ovariec-tomized female mice (CD1)	Rat in vivo assay: Dose-dependent re-sponse (0.5, 5, 50, and 500 g/kg) on vaginal cornification and uterotrophic activity in both immature and adult ova-riectomized mice.	ED	0.5, 5, 50, and 500	g/kg	GPh102yr06	0.00863	4.17E-07

Table 5.9 Output from database: Overview of the wildlife relevant ED effect data of Category 1 substances. Plus EUSES estimated data on local surface water concentrations

CAS NO	NAME	SpecieName	CONC.	UNIT	Qualifying remarks_WL	Local PEC in surface water during emission episode (dissolved) (mg/L)
1582-09-8	Trifluralin	Cyprinodon variegatus (sheepshead m	1-5	ug/l	Fish in vivo study: Pituitary effects - possibly indirect effect of exposure.	1.97
25013-16-5	tert.-Butylhydroxyanisole (BHA)	Salmo gairdneri	14.14	ug/l	Fish in vivo study: Increased vitellogenin synthesis. EC50=14.14 ug/L	2.33
1634-04-4	methyl tertiary butyl ether (MTBE)	Rana temporaria	<2500	mg/l	Amphibian in vivo study: Accelarated development and earlier metamorphosis. LOEC<2500 mg/L	4.73
131-56-6	2,4-Dihydroxybenzophenon = Resbenzophenone	Pimephales promelas	4919	µg/l	Fish in vivo study: Aquatiic exposure of fathead minnow with BP1 induced vitellogenin significantly at 4919 mg/l	5.24
13593-03-8	Quinalphos = Chinalphos	Clarias batrachus	0.025	mg/l	Fish in vivo study: Impairment of testis function due to the inhibition of steroidogenic enzymes activities. EC=0.025 mg/L	1.98
96-45-7	Ethylene Thiourea (ETU)	Not specified	5, 10, 25, 50, and 100	mg/l	Amphibian in vivo assay: In a standardised ring-tested test proposal (Xenopus metamorphosis assay) and five different ETU concns. (5, 10, 25, 50, and 100 mg/L) a concn.-dependent inhibition of metamorphosis was obsd.	0.5
5466-77-3	2-ethyl-hexyl-4-methoxycinnamate	Oryzias latipes	.	.	Fish in vivo assay. Increase in plasma VTG + and increased mRNA expression levels of estrogen receptor (ER) alpha, among sex hormone receptors in the liver.	1.06
36861-47-9	3-(4-Methylbenzylidene)camphor	Xenopus laevis	1, 5 and 50	µg/l	Amphibian in vivo study.The rate of metamorphosis was not affected, and no obvious differences in body and tail length compared to controls were observed.	0.859
120-47-8	ethyl 4-hydroxybenzoate	Rainbow trout	100	mg/kg	Fish in vivo study. VTG induction in rainbow trouts. LOAEL=100 mgkg	0.0207
94-13-3	n-propyl p-hydroxybenzoate	Oncorchynchus mykiss	22	mg/kg body weight.day	Fish in vivo assay: Clear dose response increase in VTG response. ED50 = 22 mg kg-1 2-d. NOEC	9.52

CAS NO	NAME	SpecieName	CONC.	UNIT	Qualifying remarks_WL	Local PEC in surface water during emission episode (dissolved) (mg/L)
					= 225 mg/L	
15087-24-8	3-Benzylidene camphor (3-BC)	Oncorchynchus mykiss	6.4	mg/kg/injection	Fish in vivo study: Vitellogenin induction. ED10, ED50 and ED90 of 3-benzylidene camphor after 6 days (2 injections) were 6.4, 16 and 26 mg/kg/injection, resp	7.2
131-55-5	Benzophenone-2 (Bp-2), 2,2',4,4'-tetrahydroxybenzophenone	Pimephales promelas	8783	mg/l	Fish in vivo study: Dose response related VTG induction. LOEC = 8783 mg/L	9.64
10043-35-3	Boric acid	Xenopus laevis	.		Amphibian in vivo study: Boric acid exerted reproductive toxicity in Xenopus laevis + transgenerational toxicity to the developing progeny.	2.37
92-88-6	4,4'-Dihydroxybiphenyl = 4,4'-Biphenol	Oncorchynchus mykiss	10-8 - 10-4	mg	In vitro study. Recombinant yeast assay for trout ER and trout hepatocyte cultures. Competitive binding to ER	0.964
104-40-5	4-Nonylphenol (4-NP)	Oryzias latipes	24.8	µg/l	Fish in vivo study: Induction of VTG. LOEC= 24.8 ug/l	4.34
27193-28-8	Phenol, (1,1,3,3-tetramethylbutyl)- = Octylphenol	Oryzias latipes	11.4	µg/l	Fish in vivo study. VTG induction + intersex gonads. LOEC=11.4 ug/L	5.19
611-99-4	4,4'-Dihydroxybenzophenon	Pimephales promelas	.	.	Fish in vivo assay: VTG response. In vitro: Full dose-response curves in in vitro assay (recombinant yeast carrying the estrogen receptor of rainbow trout (rtERa)). In vivo: VTG response	0.982
94-26-8	n-Butyl p-Hydroxybenzoate	Oncorchynchus mykiss	35	mg/l	Rainbow trout in vivo study. Vitellogenin response. LOED: oral exposure to 9 mg butylparaben kg-1 2d-1	1.19

5.4 Update of database and list (Task 4)

The database, which was already available for the substances categorized in the BKH 2000 and the RPS-BKH 2002 studies, was revised to include the information gathered and conclusions drawn in the present study. Likewise, the existing Endocrine Disrupter priority list was revised. The database and the Priority List were delivered in formats applicable for publication on the Commission's Endocrine Disrupters Website (Access, Excel and PDF).

The revision included the addition of the new substances (identified under Task 2 and evaluated under Task 3). The ranked priority list contains the following information on all substances:

- CAS No. and substance name
- Endocrine Disrupter category (1, 2, 3a or 3b).
- Indication of High Production Volume or Low Production Volume substance
- If the substance is assigned a R53 phrase

The updated priority list is given in Appendix L as well as in the database.

A short manual to supplement the manual for the former version of the database (RPS-BKH 2002) is prepared and both the former manual and the supplementary manual is available from the internet: http://projects.dhi.dk/Endocrine_Disrupter/testsite/)) as well as given in Appendix K.

In total, the database now includes 428 substances. The distribution (CAT 1, 2 and 3) between the evaluated substances is given in Table 5.10.

Table 5.10 Distribution of CAT 1, 2 and 3 substances now included in the database

Total number of substances evaluated		**575**
CAT 1	At least one study providing evidence for endocrine disruption in an intact organism	194
CAT 2	Potential for endocrine disruption. *In-vitro* data indicating potential for endocrine disruption in intact organisms.	125
CAT 3	No scientific basis for inclusion in list or no data	109
Not evaluated	Not in ESIS; Mixtures; no CAS; group name etc.	147

Below, the summary profiles of the 34 category 1 substances identified in the present study are presented. The summary profiles give an overview of human and wildlife related endocrine effects, physical and chemical properties, selected EUSES estimations on bioaccumulation, biodegradability in the environment, an overview of the use, production volumes, emissions, estimated environmental concentration ranges and human daily intake, the present regulatory and legal status and finally a conclusion of the level of concern (High, Medium or Low concern).

Tert.-Butylhydroxyanisole (BHA) (CAS No.: 25013-16-5)

2(3)-tert-Butyl-4-hydroxyanisole; antioxyne b; BHA; BOA; Butylated hydroxyanisole; Butyl Hydroxyanisole; tert-butyl-4-hydroxyanisole; tert-butyl-4-methoxyphenol; tert-butylhydroxyanisole; Vertac;

Human related effects

In vivo rat study. In one-generation rats, sex ratio of male was decreased and the anogenital distances were shortened and vaginal patency and preputial separation were observed later than control group. Also, BHA decreased sperm motility and number and the width and length. LOEL=10 mg/kg body weight/day

Wildlife related effect

Fish in vivo study: Increased vitellogenin synthesis. EC50=14.14 ug/L

Chemical characteristics:
Molecular formula: C11 H16 O2

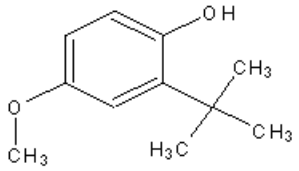

Table 1: Physical/chemical properties of tert.-Butylhydroxyanisole (BHA)

Parameter	Value	Unit	Reference
Molecular weight	180.25	g/mol	
Melting point	51	ºC	EPISUITE
Boiling point	268	ºC	EPISUITE
Vapour pressure at 25 [°C]	0.312	Pa	EPISUITE
Water solubility at 25 [°C]	212.8	mg/L	EPISUITE
Octanol-water partition coefficient	3.29	-	MST
Koc	1390	L/kg	EPISUITE
BCF	11.5	-	EPISUITE
Henry's law constant	0.00868	Pa·m^3/mole	EPISUITE
Biodegradation	Not readily biodegradable	-	CHRIP NITE
t½(hydrolysis)		Year	
t½(air)	3.56	hr	EPISUITE

Table 2: Use, exposure and emissions

Parameter	Value	Unit
Tonnage of substance in Europe	500	Tonnes/year
Release to air	3.75	kg/year
Release to wastewater	7500	kg/year
Local PEC in surface water during emission episode (dissolved)	2.3299999	mg/l
Local PEC in fresh-water sediment during emission episode	29.1	mg/(kg wet weight)
Local PEC in agric. soil (total) averaged over 180 days	43.599998	mg/(kg wet weight)
Local PEC in grassland (total) averaged over 180 days	13.5	mg/(kg wet weight)
Concentration in fish for secondary poisoning (fresh water)	59.799999	mg/(kg wet weight)
Concentration in fish-eating marine top-predators	1.29	mg/(kg wet weight)
Local total daily intake for humans	0.83399999	mg/(kg·d)
Regional total daily intake for humans	6.3300002E-5	mg/(kg wet weight)

Conclusion

Tert.-Butylhydroxyanisole (BHA) is used as an antioxidant to preserve and stabilize the freshness of food and feed and is according to the ESIS database a LPV substance. BHA is not readily biodegradable and has a high potential to bioaccumulate in the environment (log kow=3.29). BHA is in the environment

mainly distributed to surface water. Based on EUSES estimations for secondary poisoning BHA is not expected to be of significant concern. A relatively low daily human intake is expected. However, as BHA is added directly to food items to preserve and stabilize the freshness of food and feed a direct human exposure is obvious. BHA is thus considered as being of **High Concern.** None specifically regulatory or legal status for this substance was found.

Di-n-pentylphthalate (DPP) = Dipentylphthalate (CAS No.: 131-18-0)

Amoil; Di-N-pentyl phthalate; Dipentyl 1,2-benzenedicarboxylate; dipentyl ester phthalic acid; dipentyl phthalate; DPP; amyl phthalate; Phthalic acid di-n-amyl ester; phthalic acid dipentyl ester;

Human related effects

Mice in vivo study: A continuous breeding protocol was utilized to examine the reproductive toxicity of di-n-pentyl phthalate (DPP). DPP was toxic to the reproductive system as evidenced by a complete inhibition of fertility at 1.25 and 2.5% DPP and reduced fertility (litte

Wildlife related effect

No or insufficient data gathered

Chemical characteristics:
Molecular formula: C18 H26 O4

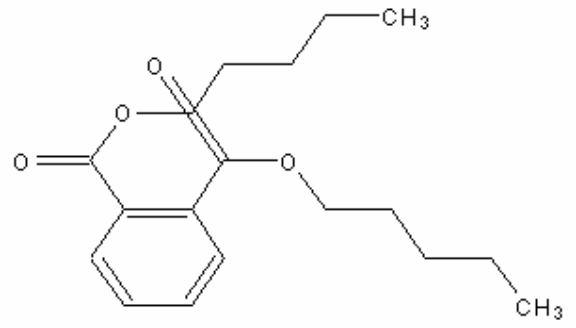

Table 1: Physical/chemical properties of Di-n-pentylphthalate (DPP) = Dipentylphthalate

Parameter	Value	Unit	Reference
Molecular weight	306.41	g/mol	
Melting point		ºC	
Boiling point	342	ºC	EPISUITE
Vapour pressure at 25 [°C]	0.026131112	Pa	EPISUITE
Water solubility at 25 [°C]	100	mg/L	EPISUITE
Octanol-water partition coefficient	5.62	-	EPISUITE
Koc	4966	L/kg	EPISUITE
BCF	29.17	-	EPISUITE
Henry's law constant	0.219	Pa·m^3/mole	EPISUITE
Biodegradation	Inherent biodegradable	-	MST
t½(hydrolysis)	3.427	Year	EPISUITE
t½(air)	10.605	hr	EPISUITE

Table 2: Use, exposure and emissions

Parameter	Value	Unit
Tonnage of substance in Europe	50	Tonnes/year
Release to air	0.3996	kg/year
Release to wastewater	799.20001	kg/year
Local PEC in surface water during emission episode (dissolved)	0.34999999	mg/l
Local PEC in fresh-water sediment during emission episode	66.900002	mg/(kg wet weight)
Local PEC in agric. soil (total) averaged over 180 days	128	mg/(kg wet weight)
Local PEC in grassland (total) averaged over 180 days	41.099998	mg/(kg wet weight)
Concentration in fish for secondary poisoning (fresh water)	1550	mg/(kg wet weight)
Concentration in fish-eating marine top-predators	1290	mg/(kg wet weight)
Local total daily intake for humans	14.7	mg/(kg·d)
Regional total daily intake for humans	0.0000774	mg/(kg wet weight)

Conclusion

Consumer and industrial applications for phthalates are numerous and range from making nail polish flexible and screwdriver handles less brittle to helping make the time-release coatings on numerous pharmaceutical products. **Dipentylphthalate** is according to the ESIS database a LPV substance. For the EUSES calculations a production volume of 50 tones per year has been used. Dipentylphthalate is inherently biodegradable and has a high potential to bioaccumulate (log Kow=5.62). Based on EUSES calculations dipentylphthalate is not expected to be found in significant amounts in the environment (surface waters and sediments). However as Dipentylphthalate is of medium concern in relation to secondary poisoning. Dipentylphthalate is thus considered as being of **Medium Concern.** None specifically regulatory or legal status for this substance was found.

2,6-cis-Diphenylhexamethylcyclotetrasiloxane - 2,6-cis-[(PhMeSiO)2(Me2SiO)2][(CAS No.: 33204-76-1)
Quadrosilan;

Human related effects
In vivo rat study. Inhibited fertility and alterations in measured characteristics of the ejaculate. LOAEL=0.5 mg/kg/day

Wildlife related effect
No or insufficient data gathered

Chemical characteristics:
Molecular formula: C18 H28 O4 Si4

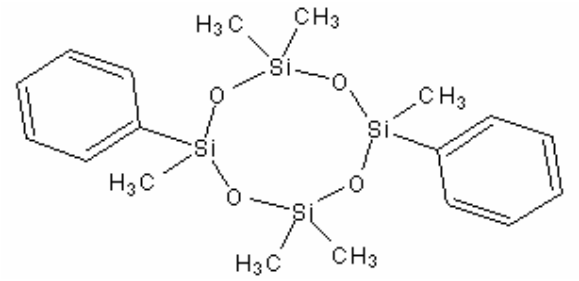

Table 1: Physical/chemical properties of 2,6-cis-Diphenylhexamethylcyclotetrasiloxane - 2,6-cis-[(PhMeSiO)2(Me2SiO)2][

Parameter	Value	Unit	Reference
Molecular weight	420.76001	g/mol	
Melting point	120.13	ºC	EPISUITE
Boiling point	360.69	ºC	EPISUITE
Vapour pressure at 25 [°C]	0.001116	Pa	EPISUITE
Water solubility at 25 [°C]	8.301e-005	mg/L	EPISUITE
Octanol-water partition coefficient	7.52	-	EPISUITE
Koc	10580000	L/kg	EPISUITE
BCF	7224	-	EPISUITE
Henry's law constant	33.5	Pa·m^3/mole	EPISUITE
Biodegradation	Not readily bio-degradable	-	EPISUITE
t½(hydrolysis)		Year	
t½(air)	26.755	hr	EPISUITE

Table 2: Use, exposure and emissions

Parameter	Value	Unit
Tonnage of substance in Europe	10	Tonnes/year
Release to air	0.1	kg/year
Release to wastewater	200	kg/year
Local PEC in surface water during emission episode (dissolved)	0.39199999	mg/l
Local PEC in fresh-water sediment during emission episode	727	mg/(kg wet weight)
Local PEC in agric. soil (total) averaged over 180 days	376	mg/(kg wet weight)
Local PEC in grassland (total) averaged over 180 days	87.099998	mg/(kg wet weight)
Concentration in fish for secondary poisoning (fresh water)	202	mg/(kg wet weight)
Concentration in fish-eating marine top-predators	913	mg/(kg wet weight)
Local total daily intake for humans	273	mg/(kg·d)
Regional total daily intake for humans	0.00112	mg/(kg wet weight)

Conclusion

Diphenylhexamethylcyclotetrasiloxane is used for various purposes as e.g. breast implants and bearing grease. Diphenylhexamethylcyclotetrasiloxane is according to the ESIS database not a LPV substance. For the EUSES calculations a production volume of 10 tones per year has been used. Diphenylhexamethylcyclotetrasiloxane is not readily biodegradable and has a high potential to bioaccumulate in the environment (log kow=7.52). Diphenylhexamethylcyclotetrasiloxane is in the environment distributed to surface water as well as sediments and agricultural soils. Based on EUSES estimations for secondary poisoning Diphenylhexamethylcyclotetrasiloxane is expected to be of medium concern. A high local daily human intake is expected (up to approx. 275 mg/kg/day). Diphenylhexamethylcyclotetrasiloxane is considered as being of **High Concern.** None specifically regulatory or legal status for this substance was found.

Ethylene Thiourea (ETU) (CAS No.: 96-45-7)

1,3-ethylene-2-thiourea; 1,3-Ethylenethiourea; Sanceller 22; sodium-22 neoprene accelerator; tetrahydro-2H-imidazole-2-thione; Vulkacit NPV/C; vulkacit npv/C2; warecure c; 2-Imidazolidimethione; 2-Imidazolidinethione; 2-mercapto-4,5-dihydroimidazole; 2-Mercaptoimidazoline; 2-thiol-dihydroglyoxaline; 4,5-dihydro-2-mercaptoimidazole; 4,5-dihydroimidazole-2(3H)-thione; Akrochem ETU-22; Ethylenethiourea; Ethylene Thiourea; Ethylene thiourea ; ETHYLENE THIOUREA (2-IMIDAZOLIDINETHIONE); ETU; imidizolidenethione; Imidazolidinethione; Imidazoline-2-thiol; Mercaptoimidazoline; Mercozen; NA-22; NA-22-D; N,N'-ethylenethiourea; pennac cra; rhodanin s 62; Robac 22;

Human related effects

In vivo rat assay: Alteration in thyroid function and a significant change in thyroid morphol (125 and 625 ppm) . NOEC = 25 ppm

Wildlife related effect

Amphibian in vivo assay: In a standardised ringtested test proposal (Xenopus metamorphosis assay) and five different ETU concns. (5, 10, 25, 50, and 100 mg/L) a concn.-dependent inhibition of metamorphosis was obsd.

Chemical characteristics:
Molecular formula: C3 H6 N2 S1

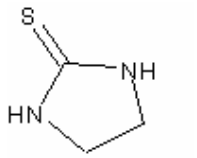

Table 1: Physical/chemical properties of Ethylene Thiourea (ETU)

Parameter	Value	Unit	Reference
Molecular weight	102.15	g/mol	
Melting point	203	ºC	
Boiling point	347.18	ºC	
Vapour pressure at 25 [°C]	0.01866508	Pa	
Water solubility at 25 [°C]	20000	mg/L	
Octanol-water partition coefficient	-0.66	-	
Koc	6.511	L/kg	
BCF	25	-	
Henry's law constant		$Pa \cdot m^3/mole$	
Biodegradation	Not readily bio-degradable	-	
t½(hydrolysis)		Year	
t½(air)		hr	

Table 2: Use, exposure and emissions

Parameter	Value	Unit
Tonnage of substance in Europe	1000	Tonnes/year
Release to air	9.9899998	kg/year
Release to wastewater	3000	kg/year
Local PEC in surface water during emission episode (dissolved)	0.5	mg/l
Local PEC in fresh-water sediment during emission episode	0.44299999	mg/(kg wet weight)
Local PEC in agric. soil (total) averaged over 180 days	0.00679	mg/(kg wet weight)
Local PEC in grassland (total) averaged over 180 days	0.00162	mg/(kg wet weight)
Concentration in fish for secondary poisoning (fresh water)	0.28999999	mg/(kg wet weight)
Concentration in fish-eating marine top-predators	5.8200001E-3	mg/(kg wet weight)
Local total daily intake for humans	0.0143	mg/(kg·d)
Regional total daily intake for humans	0.00000312	mg/(kg wet weight)

Conclusion

Ethylenethiourea (ETU) is one of the degradation products of ethylenebis-dithiocarbamate fungicides, such as maneb and zineb, which have been widely used on food crops. ETU is according to the ESIS database a LPV substance. For the EUSES calculations a production volume of 1000 tones per year has been used. ETU is not readily biodegradable and has a low potential for bioaccumulation (log Kow=-0.66). Based EUSES calculations ETU is in the environment mainly distributed to surface water in concentrations up to approx. 0.5 mg/L. ETU is expected to be found in fish, predators and human food in insignificant amounts. ETU is thus considered as being of **Low Concern.** The substance is covered by Council Directive 91/414/EEC. No RAR has been provided and the substance is not included in the list for pesticides to be reviewed. Classification: REP2;R61 XN;R22

Trifluralin (CAS No.: 1582-09-8)

2,6-Dinitro-N,N-dipropyl-4-(trifluoromethyl)-benzamine; 2,6-Dinitro-N,N-dipropyl-4-(trifluoromethyl)benzenamine; 2,6-dinitro-N,N-dipropyl-4-trifluoromethyl-aniline; 2,6-dinitro-N,N-dipropyl-alpha,alpha,alpha-trifluoro-p-toluidine; 4-(di-n-propylamino)-3,5-dinitro-1-trifluoromethylbenzene; alpha,alpha,alpha-Trifluoro-2,6-Dinitro-N,N-Dipropyl-p-Toluidine; Agreflan; agriflan 24; Benezeneamine, 2,6-dinitro-N,N-dipropyl-4-(trifluoromethyl)-; digermin; Commence; crisalin; Elancolan; elanocolan; L-36352; lilly 36,352; nitran; N,N-di-n-propyl-2,6-dinitro-4-trifluoromethylaniline; N,N-dipropyl-2,6-dinitro-4-trifluoromethylaniline; N,N-dipropyl-4-trifluoromethyl-2,6-dinitroaniline; olitref; Scotts Stop Weeds Before They Start; su seguro carpidor; TR-10; trefanocide; treficon; Treflam; Treflan; Treflan 10G; Treflan 4EC; Treflan 5G; Treflan EC; Treflan MTF; treflanocide elancolan; Treflan TR-10; Trifluralin; Trifluralin ; trifurex; trikepin; Trilin 4EC; Trim;

Human related effects

In vivo ewe study. Concentrations of estradiol were significantly increased in ewes given trifluralin. No effect on thyroxine concentration. Mean serum concentrations of LH were markedly decreased by trifluralin, and basal LH concentrations were significantly decreased. Only one dosis (17.5 mg/kg 2 times per week) was investigated

Wildlife related effect

Fish in vivo study: Pituitary effects - possibly indirect effect of exposure.

Chemical characteristics:
Molecular formula: C13 H16 F3 N3 O4

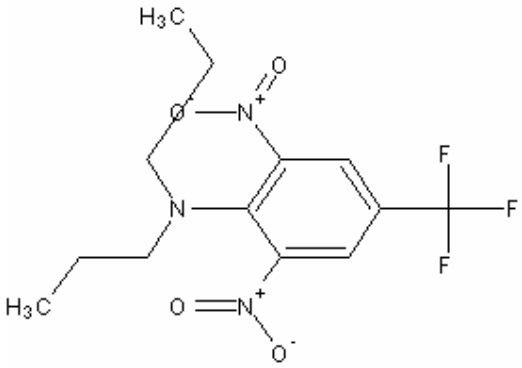

Table 1: Physical/chemical properties of Trifluralin

Parameter	Value	Unit	Reference
Molecular weight	335.29001	g/mol	
Melting point	49	ºC	EPISUITE
Boiling point	139.5	ºC	EPISUITE
Vapour pressure at 25 [°C]	0.0061061476	Pa	EPISUITE
Water solubility at 25 [°C]	0.184	mg/L	EPISUITE
Octanol-water partition coefficient	5.34	-	EPISUITE
Koc	9682	L/kg	EPISUITE
BCF	1.5	-	EPISUITE
Henry's law constant	10.43648	Pa·m^3/mole	EPISUITE
Biodegradation	Not readily biodegradable	-	CHRIP NITE
t½(hydrolysis)		Year	
t½(air)	5.347	hr	EPISUITE

Table 2: Use, exposure and emissions

Parameter	Value	Unit
Tonnage of substance in Europe	10000	Tonnes/year
Release to air	80.099998	kg/year
Release to wastewater	24000	kg/year
Local PEC in surface water during emission episode (dissolved)	1.97	mg/l
Local PEC in fresh-water sediment during emission episode	270	mg/(kg wet weight)
Local PEC in agric. soil (total) averaged over 180 days	540	mg/(kg wet weight)
Local PEC in grassland (total) averaged over 180 days	192	mg/(kg wet weight)
Concentration in fish for secondary poisoning (fresh water)	56000	mg/(kg wet weight)
Concentration in fish-eating marine top-predators	22500	mg/(kg wet weight)
Local total daily intake for humans	63.900002	mg/(kg·d)
Regional total daily intake for humans	7.9800002E-3	mg/(kg wet weight)

Conclusion

Trifluralin is used as a pesticide and is according to the ESIS database a HPV substance. For the EUSES calculations a production volume of 10000 tones per year has been used. Trifluralin is not readily biodegradable and has a high potential to bioaccumulate in the environment (log kow=5.34). Trifluralin is in the environment mainly distributed to surface water as well as sediments and agricultural soils. Based on EUSES estimations for secondary poisoning 2,4- Trifluralin is expected to be found in fish and top predators in extremely high amounts. A high human exposure up to 70 mg/kg/day is expected. Trifluralin is in the present evaluation considered as being of **High Concern.** Trifluralin is covered by Council Directive 91/414/EEC. No RAR has been provided and the substance is not included in the list for pesticides to be reviewed. Classification: XI;R36 R43 N;R50/53. Finalised assessments review by EFSA. Agreement that there is only limited evidence for endocrine effects and that this was recorded at high dose levels and was hard to distinguish from systemic toxicity. Trifluralin is considered as a POP candidate

Quinalphos = Chinalphos (CAS No.: 13593-03-8)

O,O-diethyl O-2-quinoxalinyl phosphorothioate; Bayrusil; Diethquinalphion; Diethyl O-2-quinoxalinyl phosphorothioate; Diethyl O-(2-quinoxalyl) phosphorothioate; Diethyl O-quinoxalin-2-yl thionophosphate; Diethyl O-(quinoxalin-2-yl) thiophosphate; Ekalux; Quinalphos; Quinalphos ; QUINALPHOS [O,O-DIETHYL-O-2-QUINOXALYLTHIOPHOSPHATE]; SRA 7312; Wie oben;

Human related effects

In vivo rat study: Sublethal chronic administration of quinalphos resulted in: decreased testicular mass and AChE activity in central as well as peripheral organs; increased serum LH, FSH, prolactin, and testosterone concns.; decreased pituitary or increased testicular ACE. Ed 7-14 mg/kg/day.

Wildlife related effect

Fish in vivo study: Impairment of testis function due to the inhibition of steroidogenic enzymes activities. EC=0.025 mg/L

Chemical characteristics:

Molecular formula: C12 H15 N2 O3 P1 S1

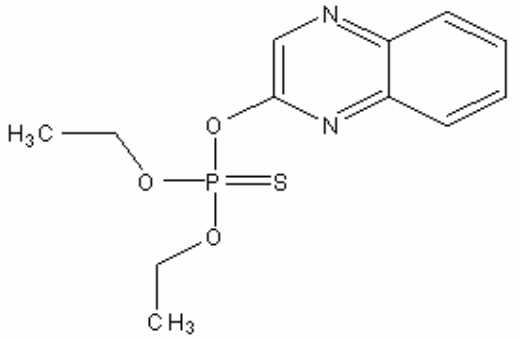

Table 1: Physical/chemical properties of Quinalphos = Chinalphos

Parameter	Value	Unit	Reference
Molecular weight	298.29999	g/mol	
Melting point	31.5	ºC	EPISUITE
Boiling point	142	ºC	EPISUITE
Vapour pressure at 25 [°C]	0.0003466372	Pa	EPISUITE
Water solubility at 25 [°C]	22	mg/L	EPISUITE
Octanol-water partition coefficient	4.44	-	EPISUITE
Koc	1857	L/kg	EPISUITE
BCF	4631	-	EPISUITE
Henry's law constant	0.005806	Pa·m^3/mole	EPISUITE
Biodegradation	Not readily bio-degradable	-	MST
t½(hydrolysis)		Year	
t½(air)	1.346	hr	EPISUITE

Table 2: Use, exposure and emissions

Parameter	Value	Unit
Tonnage of substance in Europe	500	Tonnes/year
Release to air	3.75	kg/year
Release to wastewater	7500	kg/year
Local PEC in surface water during emission episode (dissolved)	1.98	mg/l
Local PEC in fresh-water sediment during emission episode	93.099998	mg/(kg wet weight)
Local PEC in agric. soil (total) averaged over 180 days	180	mg/(kg wet weight)
Local PEC in grassland (total) averaged over 180 days	67.199997	mg/(kg wet weight)
Concentration in fish for secondary poisoning (fresh water)	482	mg/(kg wet weight)
Concentration in fish-eating marine top-predators	12.2	mg/(kg wet weight)
Local total daily intake for humans	7.9699998	mg/(kg·d)
Regional total daily intake for humans	8.2199997E-4	mg/(kg wet weight)

Conclusion

Quinalphos is used as a insecticide. Quinalphos is according to the ESIS database a LPV substance. Quinalphos is not readily biodegradable and has a high potential to bioaccumulate (log Kow=4.44). Based on EUSES estimations Quinalphos expected to be found in local surface water in concentrations up to 2 mg/L. Due to the persistency of the substance and the high potential bioaccumulation Quinalphos is of medium concern in relation to secondary poisoning and daily human intake. Quinalphos is considered as being of **Medium Concern.** Quinalphos is **c**overed by Council Directive 91/414/EEC. No RAR has been provided and the substance is not included in the list for pesticides to be reviewed. Classification: XN;R21 T;R25 N;R50/53.

Dibromochloropropane (DBCP) (CAS No.: 96-12-8)

1,2-Dibromo-3-Chloropropane; 1,3-Dibromo-3-chloropropane; os 1897; oxy dbcp; sd 1897; 1-chloro-2,3-dibromopropane; 3-chloro-1,2-dibromopropane; BBC 12; Dibromo-3-chloropropane, 1,2- (DBCP) ; dibromochloropropane; CBCP; DBCP; fumagon; Fumazone; fumazone 86; nemabrom; Nemafume; Nemagon; nemagon 20; nemagon 206; nemagon 20g; nemagon 90; nemagon soil fumigant; Nemanax; nemapaz; Nemaset; Nematocide; nematox; nemazon;

Human related effects

Exposed human workers. Azoospermia oligospermia and dose-dependent change in FSH, LH and testicle size

Wildlife related effect

No or insufficient data gathered

Chemical characteristics:

Molecular formula: C3 H5 Br2 CL1

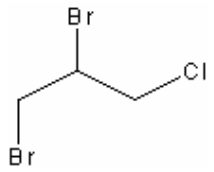

Table 1: Physical/chemical properties of Dibromochloropropane (DBCP)

Parameter	Value	Unit	Reference
Molecular weight	236.33	g/mol	
Melting point	6	ºC	EPISUITE
Boiling point	196	ºC	EPISUITE
Vapour pressure at 25 [°C]	77.32676	Pa	EPISUITE
Water solubility at 25 [°C]	1230	mg/L	SYRACUSE CHEMFATE
Octanol-water partition coefficient	2.96	-	EPISUITE
Koc	130.8	L/kg	EPISUITE
BCF	1.8	-	SYRACUSE CHEMFATE
Henry's law constant	14.89478	Pa·m^3/mole	EPISUITE
Biodegradation	Not readily biodegradable	-	MST
t½(hydrolysis)	36.124	Year	EPISUITE
t½(air)	28.636	hr	EPISUITE

Table 2: Use, exposure and emissions

Parameter	Value	Unit
Tonnage of substance in Europe	10	Tonnes/year
Release to air	9	kg/year
Release to wastewater	180	kg/year
Local PEC in surface water during emission episode (dissolved)	0.76200002	mg/l
Local PEC in fresh-water sediment during emission episode	6.5999999	mg/(kg wet weight)
Local PEC in agric. soil (total) averaged over 180 days	3.02	mg/(kg wet weight)
Local PEC in grassland (total) averaged over 180 days	0.68099999	mg/(kg wet weight)
Concentration in fish for secondary poisoning (fresh water)	0.61500001	mg/(kg wet weight)
Concentration in fish-eating marine top-predators	1.6100001E-2	mg/(kg wet weight)
Local total daily intake for humans	4.1299999E-2	mg/(kg·d)
Regional total daily intake for humans	1.77E-7	mg/(kg wet weight)

Conclusion

Dibromochloropropane (DBCP) is used as a pesticide as well as an industrial intermediate. DBCP is according to the ESIS database produced in amounts < 10 tones/year and is thus not a LPV substance. For the EUSES calculations a production volume of 10 tones per year has been used. DBCP is not readily biodegradable and has medium potential to bioaccumulate in the environment (log kow=2.96). DBCP is in the environment mainly distributed to surface water in concentrations up to approx. 1 mg/L. Based on EUSES estimations for secondary poisoning and human intake DBCP is expected to be found in fish, predators and human food in minor amounts. DBCP is considered as being of **Medium Concern.** Covered by Council Directive 91/414/EEC. No RAR has been provided and the substance is not included in the list for pesticides to be reviewed. Classification: CARC2;R45 MUT2;R46 REP1;R60 T;R25 XN;R48/20/22 R52/53.

4-Nonylphenol (4-NP) (CAS No.: 104-40-5)

4-Nonylphenol; 4-Nonylphenol, mixture of isomers;

Human related effects

Rat in vivo study: Uterine weight, uterine/body weight significantly increased in 90 mg/kg and 120 mg/kg groups and a dose-response relationship was observed.

Wildlife related effect

Fish in vivo study: Induction of VTG. LOEC= 24.8 ug/l

Chemical characteristics:
Molecular formula: C15 H24 O1

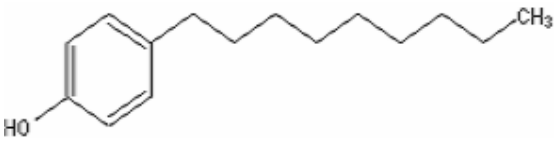

Table 1: Physical/chemical properties of 4-Nonylphenol (4-NP)

Parameter	Value	Unit	Reference
Molecular weight	220.36	g/mol	
Melting point	42	ºC	EPISUITE
Boiling point	324.47	ºC	MST
Vapour pressure at 25 [°C]	0.109057396	Pa	EPISUITE
Water solubility at 25 [°C]	7	mg/L	EPISUITE
Octanol-water partition coefficient	5.76	-	EPISUITE
Koc	60890	L/kg	EPISUITE
BCF	6.22	-	EPISUITE
Henry's law constant	3.44505	Pa·m^3/mole	EPISUITE
Biodegradation	Not readily bio-degradable	-	MST
t½(hydrolysis)		Year	
t½(air)	2.483	hr	EPISUITE

Table 2: Use, exposure and emissions

Parameter	Value	Unit
Tonnage of substance in Europe	10	Tonnes/year
Release to air	0.1	kg/year
Release to wastewater	200	kg/year
Local PEC in surface water during emission episode (dissolved)	4.3400002	mg/l
Local PEC in fresh-water sediment during emission episode	979	mg/(kg wet weight)
Local PEC in agric. soil (total) averaged over 180 days	1920	mg/(kg wet weight)
Local PEC in grassland (total) averaged over 180 days	743	mg/(kg wet weight)
Concentration in fish for secondary poisoning (fresh water)	933	mg/(kg wet weight)
Concentration in fish-eating marine top-predators	424	mg/(kg wet weight)
Local total daily intake for humans	245	mg/(kg·d)
Regional total daily intake for humans	0.000157	mg/(kg wet weight)

Conclusion

Nonylphenol (NP) is widely used as a component of detergents, paints, pesticides, and many other formulated products. 4-Nonylphenol is produced is low amount and is according to the ESIS database neither a HPV or LPV substance. 4-Nonylphenol is not readily biodegradable and has a high potential to bioaccumulate (log Kow=5.76). 4-Nonylphenol is in the environment mainly distributed to surface water as well as sediments and agricultural soils. Based on EUSES estimations for secondary poisoning 4-Nonylphenol is expected to be found both in fish and top predators in concentrations up to 1000 mg/kg wet weight. Local daily human intake is estimated to be up to 250 mg/kg body weight per day. Due to an

expected close human contact to 4-Nonylphenol via detergents and paints, 4-Nonylphenol is considered as being of **High Concern**. In the EU there is a restriction on the use of nonylphenol and its ethoxylates (Annex I of Directive 76/769/EEC) limiting the inclusion of these substances in a variety of products to no more than 0.1%. Proposed classification: Rep.3;R62 Rep.3;R63 Xn;R22 C;R34 N;R50/53

4-Cyclohexylphenol (CAS No.: 1131-60-8)
p-Cyclohexylphenol;

Human related effects
Rat in vivo study: Uterotrophic assay. Increased uterine weight. LOAEL=200 mg/kg

Wildlife related effect
No or insufficient data gathered

Chemical characteristics:
Molecular formula: C12 H16 O1

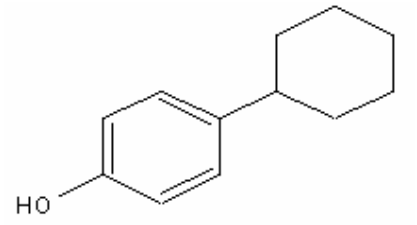

Table 1: Physical/chemical properties of 4-Cyclohexylphenol

Parameter	Value	Unit	Reference
Molecular weight	176.25999	g/mol	
Melting point	133	ºC	EPISUITE
Boiling point	294	ºC	EPISUITE
Vapour pressure at 25 [°C]	0.01016	Pa	EPISUITE
Water solubility at 25 [°C]	60	mg/L	EPISUITE
Octanol-water partition coefficient	4.22	-	EPISUITE
Koc	10120	L/kg	EPISUITE
BCF	15.92	-	EPISUITE
Henry's law constant	0.114	Pa·m^3/mole	EPISUITE
Biodegradation	Not readily bio-degradable	-	MST
t½(hydrolysis)		Year	
t½(air)	36.832	hr	EPISUITE

Table 2: Use, exposure and emissions

Parameter	Value	Unit
Tonnage of substance in Europe	10	Tonnes/year
Release to air	0.1	kg/year
Release to wastewater	200	kg/year
Local PEC in surface water during emission episode (dissolved)	8.3000002	mg/l
Local PEC in fresh-water sediment during emission episode	302	mg/(kg wet weight)
Local PEC in agric. soil (total) averaged over 180 days	569	mg/(kg wet weight)
Local PEC in grassland (total) averaged over 180 days	208	mg/(kg wet weight)
Concentration in fish for secondary poisoning (fresh water)	8.7700005	mg/(kg wet weight)
Concentration in fish-eating marine top-predators	0.211	mg/(kg wet weight)
Local total daily intake for humans	16.700001	mg/(kg·d)
Regional total daily intake for humans	0.00000963	mg/(kg wet weight)

Conclusion
4-Cyclohexylphenol is used in the formation of resin. Resin is widely used product. 4-Cyclohexylphenol is according to the ESIS database produced in low amount and is neither a HPV or LPV substance. For the EUSES calculations a production volume of 10 tones per year has been used. 4-Cyclohexylphenol is not readily biodegradable and has a high potential to bioaccumulate in the environment (log kow=4.22). 4-Cyclohexylphenol is in the environment mainly distributed to surface water as well as sediments and

agricultural soils. Based on EUSES estimations for secondary poisoning 4-Cyclohexylphenol is expected to be found in fish and top predators in minor amount. A medium human exposure is expected. 4-Cyclohexylphenol is considered as being of **Medium Concern.** None specifically regulatory or legal status for this substance was found, however the substance is related to nonylphenol.

2,4-Dihydroxybenzophenon = Resbenzophenone (CAS No.: 131-56-6)

2,4-Dihydroxybenzophenone; Benzoresorcinol; Methanone, (2,4-dihydroxyphenyl)phenyl-;

Human related effects

Rat in vivo study: Benzophenone (Bp)-1 increased uterine wt. in immature rats. Furthermore, benzophenone-1 (Bp-1) was in a previous in vitro experiment (MCF-7 cells) shown to have clear estrogenic activity (EC-50: 2.08 uM)

Wildlife related effect

Fish in vivo study: Aquatiic exposure of fathead minnow with BP1 induced vitellogenin significantly at 4919 mg/l

Chemical characteristics:

Molecular formula: C13 H10 O3

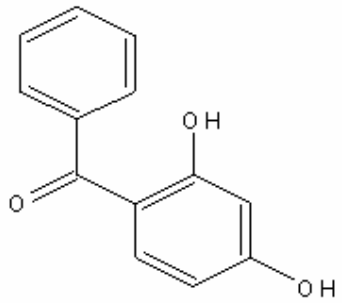

Table 1: Physical/chemical properties of 2,4-Dihydroxybenzophenon = Resbenzophenone

Parameter	Value	Unit	Reference
Molecular weight	214.22	g/mol	
Melting point	144	ºC	EPISUITE
Boiling point	374.59	ºC	MST
Vapour pressure at 25 [°C]	1.88e-005	Pa	EPISUITE
Water solubility at 25 [°C]	412.4	mg/L	EPISUITE
Octanol-water partition coefficient	2.96	-	MST
Koc	2885	L/kg	EPISUITE
BCF	94.5	-	EPISUITE
Henry's law constant	2.68e-006	Pa·m^3/mole	EPISUITE
Biodegradation	Not readily biodegradable	-	CHRIP NITE
t½(hydrolysis)		Year	
t½(air)	0.641	hr	EPISUITE

Table 2: Use, exposure and emissions

Parameter	Value	Unit
Tonnage of substance in Europe	50	Tonnes/year
Release to air	1.08	kg/year
Release to wastewater	2970	kg/year
Local PEC in surface water during emission episode (dissolved)	5.2399998	mg/l
Local PEC in fresh-water sediment during emission episode	45.400002	mg/(kg wet weight)
Local PEC in agric. soil (total) averaged over 180 days	62.099998	mg/(kg wet weight)
Local PEC in grassland (total) averaged over 180 days	18.4	mg/(kg wet weight)
Concentration in fish for secondary poisoning (fresh water)	12.7	mg/(kg wet weight)
Concentration in fish-eating marine top-predators	0.266	mg/(kg wet weight)
Local total daily intake for humans	2.3199999	mg/(kg·d)
Regional total daily intake for humans	0.0000105	mg/(kg wet weight)

Conclusion

2,4-Dihydroxybenzophenon is used as a UV sunscreen in cosmetics. 2,4-Dihydroxybenzophenon is according to the ESIS database a LPV substance. For the EUSES calculations a production volume of 50 tones per year has been used. 2,4-Dihydroxybenzophenon is not readily biodegradable and has a potential to bioaccumulate in the environment (log kow=2.96). 2,4-Dihydroxybenzophenon is in the environment mainly distributed to surface water as well as sediments and agricultural soils. Based on EUSES estimations for secondary poisoning 2,4-Dihydroxybenzophenon is not expected to be found in fish and top predators. A high human exposure is expected mainly due to the fact that the substance is used as a UV screen in cosmetics. 2,4-Dihydroxybenzophenon is therefore considered as being of **High Concern.** None specifically regulatory or legal status for this substance was found..

4,4'-Dihydroxybenzophenon (CAS No.: 611-99-4)

4,4'-Dihydroxybenzophenone; DHBP;

Human related effects

rat in vivo assay: Induced uterotrophy and exerted both estrogen agonistic effect and reduced the estrogenic effect of ethynylestradiol

Wildlife related effect

Fish in vivo assay: VTG response. In vitro: Full dose-response curves in in vitro assay (recombinant yeast carrying the estrogen receptor of rainbow trout (rtERa)). In vivo: VTG response

Chemical characteristics:
Molecular formula: C13 H10 O3

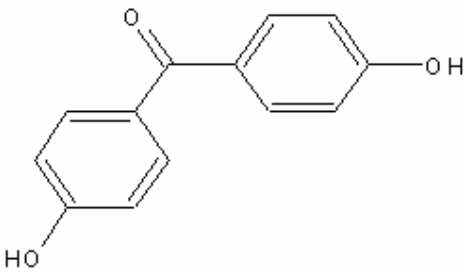

Table 1: Physical/chemical properties of 4,4'-Dihydroxybenzophenon

Parameter	Value	Unit	Reference
Molecular weight	214.22	g/mol	
Melting point	210	ºC	EPISUITE
Boiling point	374.59	ºC	MST
Vapour pressure at 25 [°C]	3.28e-006	Pa	EPISUITE
Water solubility at 25 [°C]	1905	mg/L	EPISUITE
Octanol-water partition coefficient	2.19	-	MST
Koc	2826	L/kg	EPISUITE
BCF	33.52	-	EPISUITE
Henry's law constant	2.13e-009	Pa·m^3/mole	EPISUITE
Biodegradation	Not readily biodegradable	-	MST
t½(hydrolysis)		Year	
t½(air)	2.103	hr	EPISUITE

Table 2: Use, exposure and emissions

Parameter	Value	Unit
Tonnage of substance in Europe	10	Tonnes/year
Release to air	9.0000004E-2	kg/year
Release to wastewater	180	kg/year
Local PEC in surface water during emission episode (dissolved)	0.98199999	mg/l
Local PEC in fresh-water sediment during emission episode	3.8499999	mg/(kg wet weight)
Local PEC in agric. soil (total) averaged over 180 days	3.05	mg/(kg wet weight)
Local PEC in grassland (total) averaged over 180 days	0.73199999	mg/(kg wet weight)
Concentration in fish for secondary poisoning (fresh water)	0.176	mg/(kg wet weight)
Concentration in fish-eating marine top-predators	0.00358	mg/(kg wet weight)
Local total daily intake for humans	0.34400001	mg/(kg·d)
Regional total daily intake for humans	4.3599999E-7	mg/(kg wet weight)

Conclusion

4,4'-Dihydroxybenzophenon is used as a UV sunscreen in cosmetics. 4,4'-Dihydroxybenzophenon is according to the ESIS database produced in amounts < 10 tones/year and thus not a LPV substance. For the EUSES calculations a production volume of 10 tones per year has been used. 4,4'-Dihydroxybenzophenon is not readily biodegradable and has a medium potential to bioaccumulate in the environment (log kow=2.19). 4,4'-Dihydroxybenzophenon is in the environment mainly distributed to surface water. Based on EUSES estimations for secondary poisoning 4,4-Dihydroxybenzophenon is expected to be found in fish and top predators in minor amounts. A high human exposure is expected mainly due to the fact that the substance is used as a UV screen in cosmetics. 4,4-Dihydroxybenzophenon is therefore considered as being of **Medium Concern.** None specifically regulatory or legal status for this substance was found.

Methyl tertiary butyl ether (MTBE) (CAS No.: 1634-04-4)

2-methoxy-2-methylpropane; methyl t-butyl ether; Methyl Tertiary Butyl Ether; Methyl Tertiary Butyl Ether (MTBE) ; MTBE; Tert-butyl methyl ether;

Human related effects

Rat in vio study: Increase of testis weight. Interstitial fluid and serum testosterone levels as well as serum prolactin levels were decreased only in animals treated with 1500 mg MTBE/kg/day for 15 days.

Wildlife related effect

Amphibian in vivo study: Accelarated development and earlier metamorphosis. LOEC<2500 mg/L

Chemical characteristics:
Molecular formula: C5 H12 O1

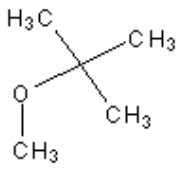

Table 1: Physical/chemical properties of methyl tertiary butyl ether (MTBE)

Parameter	Value	Unit	Reference
Molecular weight	88.150002	g/mol	
Melting point	-108.6	ºC	IUCLID
Boiling point	55.3	ºC	IUCLID
Vapour pressure at 25 [°C]	26800	Pa	IUCLID
Water solubility at 25 [°C]	26000	mg/L	IUCLID
Octanol-water partition coefficient	1.06	-	IUCLID
Koc	5.258	L/kg	EPISUITE
BCF	28.4	-	IUCLID
Henry's law constant	59.47778	Pa·m^3/mole	EPISUITE
Biodegradation	Not readily bio-degradable	-	IUCLID
t½(hydrolysis)		Year	
t½(air)	2.6	hr	IUCLID

Table 2: Use, exposure and emissions

Parameter	Value	Unit
Tonnage of substance in Europe	50000	Tonnes/year
Release to air	1251000	kg/year
Release to wastewater	75000	kg/year
Local PEC in surface water during emission episode (dissolved)	4.73	mg/l
Local PEC in fresh-water sediment during emission episode	7.54	mg/(kg wet weight)
Local PEC in agric. soil (total) averaged over 180 days	0.199	mg/(kg wet weight)
Local PEC in grassland (total) averaged over 180 days	8.6900003E-2	mg/(kg wet weight)
Concentration in fish for secondary poisoning (fresh water)	3.0899999	mg/(kg wet weight)
Concentration in fish-eating marine top-predators	0.163	mg/(kg wet weight)
Local total daily intake for humans	0.39500001	mg/(kg·d)
Regional total daily intake for humans	4.0999999E-5	mg/(kg wet weight)

Conclusion

Methyl tertiary butyl ether is used as a petrol additive and is according to the ESIS database a HPV substance. For the EUSES calculations a production volume of 50000 tones per year has been used. Methyl tertiary butyl ether is not readily biodegradable and has a low potential to bioaccumulate in the environment (log kow=1.06). Methyl tertiary butyl ether is in the environment mainly distributed to surface

waters. Based on EUSES estimations for secondary poisoning 2,4- Methyl tertiary butyl ether is expected to be found in fish and top predators in minor amount. A relatively low daily human intake is expected. Due to the fact that Methyl tertiary butyl ether is a high volume substance and not readily biodegradable relatively high concentrations in surface waters can be expected and Methyl tertiary butyl ether is thus considered as being of **Medium Concern.** RAR from 2002 is available on ESIS. Classification: F;R11 XI;R38

Cyclotetrasiloxane (CAS No.: 556-67-2)

Octamethylcyclotetrasiloxane;

Human related effects

Rat in vivo assay. Uterotrophic assay with two species: Relative uterine wts. and uterine epithelial cell height were statistically significantly increased in both strains of rats at doses above 100 mg/kg/day. LO-AEL=250 mg/kg/day

Wildlife related effect

No or insufficient data gathered

Chemical characteristics:

Molecular formula: C8 H24 O4 Si4

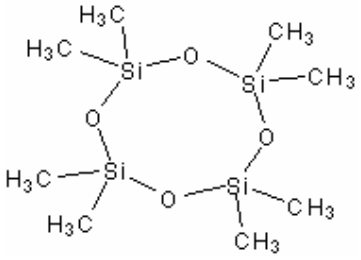

Table 1: Physical/chemical properties of Cyclotetrasiloxane

Parameter	Value	Unit	Reference
Molecular weight	296.62	g/mol	
Melting point	17.5	ºC	EPISUITE
Boiling point	175.8	ºC	EPISUITE
Vapour pressure at 25 [°C]	139.9881	Pa	EPISUITE
Water solubility at 25 [°C]	0.005	mg/L	EPISUITE
Octanol-water partition coefficient	4.45	-	SYRACUSE CHEMFATE
Koc	17960	L/kg	EPISUITE
BCF	1.392	-	EPISUITE
Henry's law constant	11855.03	Pa·m^3/mole	EPISUITE
Biodegradation	Not readily bio-degradable	-	EPISUITE
t½(hydrolysis)		Year	
t½(air)	107.246	hr	EPISUITE

Table 2: Use, exposure and emissions

Parameter	Value	Unit
Tonnage of substance in Europe	50000	Tonnes/year
Release to air	300000	kg/year
Release to wastewater	90000	kg/year
Local PEC in surface water during emission episode (dissolved)	0.65899998	mg/l
Local PEC in fresh-water sediment during emission episode	31.4	mg/(kg wet weight)
Local PEC in agric. soil (total) averaged over 180 days	4.3299999E-2	mg/(kg wet weight)
Local PEC in grassland (total) averaged over 180 days	8.7299999E-3	mg/(kg wet weight)
Concentration in fish for secondary poisoning (fresh water)	328	mg/(kg wet weight)
Concentration in fish-eating marine top-predators	149	mg/(kg wet weight)
Local total daily intake for humans	1.15	mg/(kg·d)
Regional total daily intake for humans	3.8400001E-4	mg/(kg wet weight)

Conclusion

Cyclotetrasiloxane has numerous industrial and consumer applications and is according to the ESIS database a HPV substance. For the EUSES calculations a production volume of 50000 tones per year has been used. Cyclotetrasiloxane is not readily biodegradable and has a high potential to bioaccumulate in the environment (log kow=5.45). Cyclotetrasiloxane is in the environment mainly distributed to surface water. Based on EUSES estimations for secondary poisoning Cyclotetrasiloxane is expected to be found in fish and top predators in minor amounts. Cyclotetrasiloxane has a potential for human exposure as it is used in numerous industrial and consumer. Applications. Cyclotetrasiloxane is considered as being of **High Concern.** None specifically regulatory or legal status for this substance was found. Classification: REP3;R62 R53

2-ethyl-hexyl-4-methoxycinnamate (CAS No.: 5466-77-3)

2-Ethylhexyl 4-methoxycinnamate; 2-Ethylhexyl cinnamate; 3-(4-Methoxyphenyl)-2-propenoic acid 2-ethylhexyl ester; Escalol 557; Neo Heliopan AV.; Octyl 4-methoxycinnamate; Octyl methoxycinnamate; Parsol MCX; Parsol MOX;

Human related effects

Rat in vivo assay. Uterine wt. was dose-dependently increased by OMC (ED50 935 mg/kg/day)

Wildlife related effect

Fish in vivo assay. Increase in plasma VTG + and increased mRNA expression levels of estrogen receptor (ER) alpha, among sex hormone receptors in the liver.

Chemical characteristics:
Molecular formula: C18 H26 O3

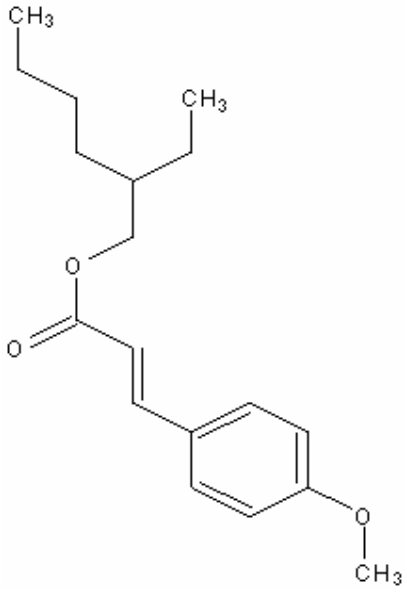

Table 1: Physical/chemical properties of 2-ethyl-hexyl-4-methoxycinnamate

Parameter	Value	Unit	Reference
Molecular weight	290.41	g/mol	
Melting point	99.87	ºC	EPISUITE
Boiling point	360.54	ºC	MST
Vapour pressure at 25 [°C]	0.00184	Pa	EPISUITE
Water solubility at 25 [°C]	0.1548	mg/L	EPISUITE
Octanol-water partition coefficient	5.8	-	MST
Koc	12280	L/kg	EPISUITE
BCF	12400	-	EPISUITE
Henry's law constant	0.18	Pa·m^3/mole	EPISUITE
Biodegradation	Readily biodegradable	-	MST
t½(hydrolysis)	35.562	Year	EPISUITE
t½(air)	2.483	hr	EPISUITE

Table 2: Use, exposure and emissions

Parameter	Value	unit
Tonnage of substance in Europe	5000	Tonnes/year
Release to air	5.0100002	kg/year
Release to wastewater	15000	kg/year
Local PEC in surface water during emission episode (dissolved)	1.0599999	mg/l
Local PEC in fresh-water sediment during emission episode	251	mg/(kg wet weight)
Local PEC in agric. soil (total) averaged over 180 days	490	mg/(kg wet weight)
Local PEC in grassland (total) averaged over 180 days	190	mg/(kg wet weight)
Concentration in fish for secondary poisoning (fresh water)	73900	mg/(kg wet weight)
Concentration in fish-eating marine top-predators	34400	mg/(kg wet weight)
Local total daily intake for humans	89.199997	mg/(kg·d)
Regional total daily intake for humans	0.0131	mg/(kg wet weight)

Conclusion

2-ethyl-hexyl-4-methoxycinnamate is used as a UV sunscreen in cosmetics. 2-ethyl-hexyl-4-methoxycinnamate is according to the ESIS database a HPV substance. For the EUSES calculations a production volume of 5000 tones per year has been used. 2-ethyl-hexyl-4-methoxycinnamate is readily biodegradable and has a high potential to bioaccumulate in the environment (log kow=5.8). 2-ethyl-hexyl-4-methoxycinnamate is in the environment mainly distributed to surface water as well as sediments and agricultural soils. Based on EUSES estimations for secondary poisoning 2-ethyl-hexyl-4-methoxycinnamate is expected to be found in fish and top predators in amounts up to approx. 70000 mg/kg ww. Furthermore a high regional human exposure is expected. Besides a high human exposure is expected mainly due to the fact that the substance is used as a UV screen in cosmetics. 2-ethyl-hexyl-4-methoxycinnamate is therefore considered as being of **High Concern.** None specifically regulatory or legal status for this substance was found.

3-(4-Methylbenzylidene)camphor (CAS No.: 36861-47-9)

3-(4-Methylbenzyliden)camphor; Eusolex 6300;

Human related effects

Rat in vivo study. Delayed male puberty, and dose-dependently affected reproductive organ wts. of adult male and female F1 offspring, with partly different effect patterns. Thyroid wt. was increased by higher 4-MBC doses. LOAEL=7 mg/kg/day

Wildlife related effect

Amphibian in vivo study.The rate of metamorphosis was not affected, and no obvious differences in body and tail length compared to controls were observed.

Chemical characteristics:
Molecular formula: C18 H22 O1

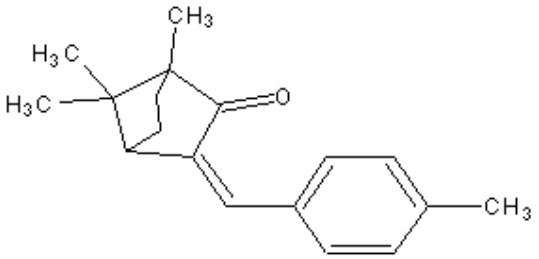

Table 1: Physical/chemical properties of 3-(4-Methylbenzylidene)camphor

Parameter	Value	Unit	Reference
Molecular weight	254.38	g/mol	
Melting point	121	ºC	EPISUITE
Boiling point	349.42	ºC	MST
Vapour pressure at 25 [°C]	0.002027	Pa	EPISUITE
Water solubility at 25 [°C]	0.1966	mg/L	EPISUITE
Octanol-water partition coefficient	5.22	-	MST
Koc	12210	L/kg	EPISUITE
BCF	3.162	-	EPISUITE
Henry's law constant	0.218	Pa·m^3/mole	EPISUITE
Biodegradation	Not readily bio-degradable	-	EPISUITE
t½(hydrolysis)		Year	
t½(air)	1.443	hr	EPISUITE

Table 2: Use, exposure and emissions

Parameter	Value	Unit
Tonnage of substance in Europe	50	Tonnes/year
Release to air	0.3996	kg/year
Release to wastewater	799.20001	kg/year
Local PEC in surface water during emission episode (dissolved)	0.85900003	mg/l
Local PEC in fresh-water sediment during emission episode	102	mg/(kg wet weight)
Local PEC in agric. soil (total) averaged over 180 days	202	mg/(kg wet weight)
Local PEC in grassland (total) averaged over 180 days	76.599998	mg/(kg wet weight)
Concentration in fish for secondary poisoning (fresh water)	1730	mg/(kg wet weight)
Concentration in fish-eating marine top-predators	594	mg/(kg wet weight)
Local total daily intake for humans	15.7	mg/(kg·d)
Regional total daily intake for humans	0.000237	mg/(kg wet weight)

Conclusion

3-(4-Methylbenzylidene)camphor is used as a UV sunscreen in cosmetics. 3-(4-Methylbenzylidene)camphor is according to the ESIS database a LPV substance. For the EUSES calculations a production volume of 50 tones per year has been used. 3-(4-Methylbenzylidene)camphor is not readily biodegradable and has a high potential to bioaccumulate in the environment (log kow=5.22). 3-(4-Methylbenzylidene)camphor is in the environment mainly distributed to surface water as well as sediments and agricultural soils. Based on EUSES estimations for secondary poisoning 3-(4-Methylbenzylidene)camphor is expected to be found in fish and top predators in amounts up to approx. 2000 mg/kg ww. A high human exposure is expected mainly due to the fact that the substance is used as a UV screen in cosmetics. 3-(4-Methylbenzylidene)camphor is therefore considered as being of **High Concern.** None specifically regulatory or legal status for this substance was found.

p-Hydroxybenzoic acid (CAS No.: 99-96-7)

4-Hydroxybenzenecarboxylic acid; 4-Hydroxybenzoic acid;

Human related effects

Rat in vivo assay: Dose-dependent response (0.5, 5, 50, and 500 g/kg) on vaginal cornification and uterotrophic activity in both immature and adult ovariectomized mice.

Wildlife related effect

No or insufficient data gathered

Chemical characteristics:

Molecular formula: C7 H6 O3

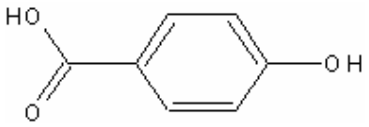

Table 1: Physical/chemical properties of p-Hydroxybenzoic acid

Parameter	Value	Unit	Reference
Molecular weight	138.12	g/mol	
Melting point	214.5	ºC	EPISUITE
Boiling point	298.03	ºC	MST
Vapour pressure at 25 [°C]	2.6397756e-005	Pa	EPISUITE
Water solubility at 25 [°C]	5000	mg/L	EPISUITE
Octanol-water partition coefficient	1.58	-	SYRACUSE CHEMFATE
Koc	23.47	L/kg	EPISUITE
BCF		-	EPISUITE
Henry's law constant	1.14e-006	Pa·m^3/mole	EPISUITE
Biodegradation	Readily biodegradable	-	CHRIP NITE
t½(hydrolysis)		Year	
t½(air)	9.873	hr	EPISUITE

Table 2: Use, exposure and emissions

Parameter	Value	Unit
Tonnage of substance in Europe	1000	Tonnes/year
Release to air	9.9899998	kg/year
Release to wastewater	3000	kg/year
Local PEC in surface water during emission episode (dissolved)	6.2899999E-2	mg/l
Local PEC in fresh-water sediment during emission episode	0.14399999	mg/(kg wet weight)
Local PEC in agric. soil (total) averaged over 180 days	0.0275	mg/(kg wet weight)
Local PEC in grassland (total) averaged over 180 days	0.0106	mg/(kg wet weight)
Concentration in fish for secondary poisoning (fresh water)	0.114	mg/(kg wet weight)
Concentration in fish-eating marine top-predators	1.8100001E-2	mg/(kg wet weight)
Local total daily intake for humans	8.6300001E-3	mg/(kg·d)
Regional total daily intake for humans	4.17E-7	mg/(kg wet weight)

Conclusion

p-Hydroxybenzoic acid is the common metabolite of all parabens and thus used as a preservative in food, pharmaceutical and cosmetic formulations. p-Hydroxybenzoate is according to the ESIS database a LPV substance. For the EUSES calculations a production volume of 1000 tonnes per year has been used. P-hydroxybenzoic acid is readily biodegradable and has a low potential for bioaccumulation (log Kow=1.58). Based EUSES calculations p-Hydroxybenzoic acid is distributed to the environment at low concentrations. P-hydroxybenzoic acid is expected to be found in fish, predators and human food in in-

significant amounts. However, as P-hydroxybenzoic acid is used as a preservative in food and cosmetics a high direct human exposure is expected. P-hydroxybenzoic acid is thus considered as being of **Medium Concern.** None specifically regulatory or legal status for this substance was found. It is the opinium of the Scientific Commitee on Consumer Products (SCCP) that, viewing the current knowledge, there is no evidence of demonstrable risk for the development of breast cancer caused by the use of underarm cosmetics including parabens.

Methyl p-hydroxybenzoate (CAS No.: 99-76-3)

4-Hydroxybenzoic acid methyl ester; 4-Hydroxy methyl benzoate; Aseptoform; Methyl paraben; Methyl 4-hydroxybenzoate; Methyl Parasept; Methyl Chemosept; Nipagin; Nipagin M; Tegosept M;

Human related effects

In vivo mice assay: The highest MePben dose (165 mg/kg) was able to produce uterotrophic effects (38 to 76%) compared to E-2 efects (100%). LOAEL=165 mg/kg

Wildlife related effect

No or insufficient data gathered

Chemical characteristics:
Molecular formula: C8 H8 O3

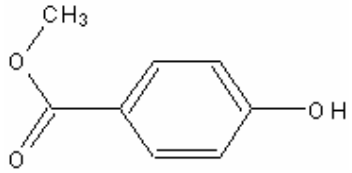

Table 1: Physical/chemical properties of Methyl p-Hydroxybenzoate

Parameter	Value	Unit	Reference
Molecular weight	152.14999	g/mol	
Melting point	131	ºC	EPISUITE
Boiling point	275	ºC	EPISUITE
Vapour pressure at 25 [°C]	0.114	Pa	EPISUITE
Water solubility at 25 [°C]	2500	mg/L	EPISUITE
Octanol-water partition coefficient	1.96	-	EPISUITE
Koc	125.6	L/kg	EPISUITE
BCF	3.162	-	EPISUITE
Henry's law constant	0.000366	Pa·m^3/mole	EPISUITE
Biodegradation	Readily biode-gradable	-	MST
t½(hydrolysis)	34.506	Year	EPISUITE
t½(air)	11.6	hr	EPISUITE

Table 2: Use, exposure and emissions

Parameter	Value	Unit
Tonnage of substance in Europe	500	Tonnes/year
Release to air	5	kg/year
Release to wastewater	10000	kg/year
Local PEC in surface water during emission episode (dissolved)	1.25	mg/l
Local PEC in fresh-water sediment during emission episode	3.96	mg/(kg wet weight)
Local PEC in agric. soil (total) averaged over 180 days	0.87199998	mg/(kg wet weight)
Local PEC in grassland (total) averaged over 180 days	0.33899999	mg/(kg wet weight)
Concentration in fish for secondary poisoning (fresh water)	0.79500002	mg/(kg wet weight)
Concentration in fish-eating marine top-predators	0.127	mg/(kg wet weight)
Local total daily intake for humans	0.0276	mg/(kg·d)
Regional total daily intake for humans	0.00000145	mg/(kg wet weight)

Conclusion

Methyl p-Hydroxybenzoate is used as a preservative in food, pharmaceutical and cosmetic formulations. Methyl p-Hydroxybenzoate is according to the ESIS database a LPV substance. For the EUSES calculations a production volume of 500 tones per year has been used. Methyl p-hydroxybenzoate is readily biodegradable and has a low potential for bioaccumulation (log Kow=1.96). Based EUSES calcu-

lations Methyl p-hydroxybenzoate is in the environment mainly distributed to surface water in concentrations up to approx. 1 mg/L. Methyl p-hydroxybenzoate is expected to be found in fish, predators and human food in insignificant amounts. However, as Methyl p-hydroxybenzoate is used as a preservative in food and cosmetics a high direct human exposure is expected. Methyl p-hydroxybenzoate is thus considered as being of **Medium Concern.** None specifically regulatory or legal status for this substance was found. It is the opinium of the Scientific Commitee on Consumer Products (SCCP) that, viewing the current knowledge, there is no evidence of demonstrable risk for the development of breast cancer caused by the use of underarm cosmetics including parabens.

Ethyl 4-hydroxybenzoate (CAS No.: 120-47-8)

4-Hydroxybenzoic acid ethyl ester; Ethyl paraben; Ethyl 4-hydroxybenzoate; Ethyl Parasept; Nipagin A; Solbrol A;

Human related effects

Rat and mice in vivo study: Increased uterine weight in immature and ovariectomized animals. ED50 18-74 µmol/ kg body weight

Wildlife related effect

Fish in vivo study. VTG induction in rainbow trouts. LOAEL=100 mgkg

Chemical characteristics:

Molecular formula: C9 H10 O3

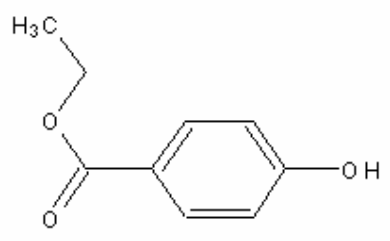

Table 1: Physical/chemical properties of ethyl 4-hydroxybenzoate

Parameter	Value	Unit	Reference
Molecular weight	254.38	g/mol	
Melting point	117	ºC	EPISUITE
Boiling point	297.5	ºC	EPISUITE
Vapour pressure at 25 [°C]	0.01239	Pa	EPISUITE
Water solubility at 25 [°C]	885	mg/L	EPISUITE
Octanol-water partition coefficient	2.47	-	EPISUITE
Koc	231.6	L/kg	EPISUITE
BCF	9.141	-	EPISUITE
Henry's law constant	0.000486	Pa·m^3/mole	EPISUITE
Biodegradation	Readily biode-gradable	-	MST
t½(hydrolysis)		Year	
t½(air)	10.207	hr	EPISUITE

Table 2: Use, exposure and emissions

Parameter	Value	Unit
Tonnage of substance in Europe	50	Tonnes/year
Release to air	0.50099999	kg/year
Release to wastewater	999	kg/year
Local PEC in surface water during emission episode (dissolved)	0.0207	mg/l
Local PEC in fresh-water sediment during emission episode	0.107	mg/(kg wet weight)
Local PEC in agric. soil (total) averaged over 180 days	2.6799999E-2	mg/(kg wet weight)
Local PEC in grassland (total) averaged over 180 days	0.0105	mg/(kg wet weight)
Concentration in fish for secondary poisoning (fresh water)	0.214	mg/(kg wet weight)
Concentration in fish-eating marine top-predators	3.4400001E-2	mg/(kg wet weight)
Local total daily intake for humans	0.00177	mg/(kg·d)
Regional total daily intake for humans	2.3299999E-7	mg/(kg wet weight)

Conclusion

Ethyl 4-hydroxybenzoate is used as preservatives in food, pharmaceutical and cosmetic formulations. Ethyl 4-hydroxybenzoate is produced in amounts up to 50 tones per year and thus a LPV substance.

Ethyl 4-hydroxybenzoate is readily biodegradable and has a medium potential for bioaccumulation. Based EUSES calculations Ethyl 4-hydroxybenzoate is expected to be released to the environment in insignificant amounts and is not expected to give any problems in relation to secondary poisoning. However, as ethyl 4-hydroxybenzoate as a preservative in food and cosmetics a high human exposure is expected. Ethyl 4-hydroxybenzoate is thus considered as being of **Medium Concern**. None specifically regulatory or legal status for this substance was found.

n-propyl p-hydroxybenzoate (CAS No.: 94-13-3)

Parabens; 4-Hydroxybenzoic acid propyl ester; Propyl chemsept; protaben p; pulvis conservans; Solbrol P; tegosept p; 4-hydroxybenzoic propyl ester; p-hydroxy propyl benzoate; aseptoform p; betacide p; bonomold op; Chemacide PK; Chemocide PK; Chemoside PK; nipagin p; Nipasol; nipasol m; nipasol p; nipazol; n-Propyl paraben; n-propyl p-hydroxybenzoate; paseptol; preserval p; propagin; Propyl paraben; Propyl 4-hydroxybenzoate; Propyl Parasept; propyl aseptoform; propyl butex; Propyl Chemosept;

Human related effects

In vivo rat assay: The epididymal sperm reserves and concentrations decreased dose dependently and the difference was significant at doses of 0.1% and above. LOAEL=0.1%

Wildlife related effect

Fish in vivo assay: Clear dose response increase in VTG response. ED50 = 22 mg kg-1 2-d. NOEC = 225 mg/L

Chemical characteristics:
Molecular formula: C10 H12 O3

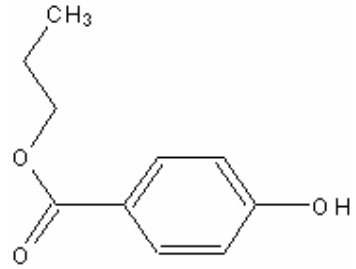

Table 1: Physical/chemical properties of n-propyl p-hydroxybenzoate

Parameter	Value	Unit	Reference
Molecular weight	180.21001	g/mol	
Melting point	97	ºC	EPISUITE
Boiling point	285.14	ºC	MST
Vapour pressure at 25 [°C]	0.04093	Pa	EPISUITE
Water solubility at 25 [°C]	500	mg/L	EPISUITE
Octanol-water partition coefficient	3.04	-	EPISUITE
Koc	427.2	L/kg	EPISUITE
BCF	111.9	-	EPISUITE
Henry's law constant	0.000645	Pa·m^3/mole	EPISUITE
Biodegradation	Readily biodegradable	-	MST
t½(hydrolysis)	43.052	Year	EPISUITE
t½(air)	9.124	hr	EPISUITE

Table 2: Use, exposure and emissions

Parameter	Value	Unit
Tonnage of substance in Europe	10	Tonnes/year
Release to air	0.1	kg/year
Release to wastewater	200	kg/year
Local PEC in surface water during emission episode (dissolved)	9.5200005	mg/l
Local PEC in fresh-water sediment during emission episode	90	mg/(kg wet weight)
Local PEC in agric. soil (total) averaged over 180 days	124	mg/(kg wet weight)
Local PEC in grassland (total) averaged over 180 days	36.799999	mg/(kg wet weight)
Concentration in fish for secondary poisoning (fresh water)	0.99900001	mg/(kg wet weight)
Concentration in fish-eating marine top-predators	0.021	mg/(kg wet weight)
Local total daily intake for humans	2.0799999	mg/(kg·d)
Regional total daily intake for humans	0.00000106	mg/(kg wet weight)

Conclusion

N-propyl p-hydroxybenzoate is used as a preservative in food, pharmaceutical and cosmetic formulations. N-propyl p-hydroxybenzoate is produced in amounts up to 10 tones per year and thus a LPV substance. N-propyl p-hydroxybenzoate is readily biodegradable and has potential for bioaccumulation (log Kow=3.04). Based EUSES calculations N-propyl p-hydroxybenzoate is in the environment mainly distributed to surface waters in concentrations up to approx. 10 mg/L. N-propyl p-hydroxybenzoate is expected to be found in fish, predators and human food in insignificant amounts. However, as n-propyl p-hydroxybenzoate is used as a preservative in food and cosmetics a high human exposure is expected. N-propyl p-hydroxybenzoate is thus considered as being of **Medium Concern.** None specifically regulatory or legal status for this substance was found. It is the opinium of the Scientific Commitee on Consumer Products (SCCP) that, viewing the current knowledge, there is no evidence of demonstrable risk for the development of breast cancer caused by the use of underarm cosmetics including parabens

n-Butyl p-Hydroxybenzoate (CAS No.: 94-26-8)

4-(butoxycarbonyl)phenol; 4-Hydroxybenzoic acid butyl ester; p-hydroxybenzoic acid n-butyl ester; p-Hydroxy butyl benzoate; aseptoform butyl; Butoben; Butyl paraben; Butyl 4-hydroxybenzoate; Butyl Parasept; butyl butex; Butyl Chemosept; butyl tegosept; n-Butyl paraben; n-Butyl p-Hydroxybenzoate; nipabutyl; preserval b; solbrol b; SPF; Tegosept B; tegosept butyl;

Human related effects

In vivo mice study. A dose-dependent decrease of both round and elongated spermatid ounts in stages VII-VIII seminiferous tubules was observed, and the elongated spermatid counts were significantly lower in all of the treated groups. The serum testosterone concentration decreased in a dose-dependent fashion and was significant at 1.00%. LOAEL=1504 mg/kg body weight. Day

Wildlife related effect

Rainbow trout in vivo study. Vitellogenin response. LOED: oral exposure to 9 mg butylparaben kg-1 2d-1

Chemical characteristics:
Molecular formula: C11 H14 O3

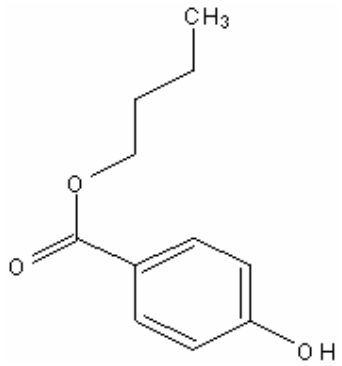

Table 1: Physical/chemical properties of n-Butyl p-Hydroxybenzoate

Parameter	Value	Unit	Reference
Molecular weight	194.23	g/mol	
Melting point	68.5	ºC	EPISUITE
Boiling point	300.26	ºC	MST
Vapour pressure at 25 [°C]	0.0334	Pa	EPISUITE
Water solubility at 25 [°C]	207	mg/L	EPISUITE
Octanol-water partition coefficient	3.57	-	EPISUITE
Koc	787.8	L/kg	EPISUITE
BCF	37.95	-	EPISUITE
Henry's law constant	0.000856	Pa·m^3/mole	EPISUITE
Biodegradation	Readily biodegradable	-	MST
t½(hydrolysis)	43.052	Year	EPISUITE
t½(air)	8.291	hr	EPISUITE

Table 2: Use, exposure and emissions

Parameter	Value	Unit
Tonnage of substance in Europe	10	Tonnes/year
Release to air	0.1	kg/year
Release to wastewater	200	kg/year
Local PEC in surface water during emission episode (dissolved)	1.1900001	mg/l
Local PEC in fresh-water sediment during emission episode	20.4	mg/(kg wet weight)
Local PEC in agric. soil (total) averaged over 180 days	5.6700001	mg/(kg wet weight)
Local PEC in grassland (total) averaged over 180 days	2.26	mg/(kg wet weight)
Concentration in fish for secondary poisoning (fresh water)	0.35299999	mg/(kg wet weight)
Concentration in fish-eating marine top-predators	5.9099998E-2	mg/(kg wet weight)
Local total daily intake for humans	0.105	mg/(kg·d)
Regional total daily intake for humans	2.4600001E-7	mg/(kg wet weight)

Conclusion

n-Butyl p-Hydroxybenzoate is used as a preservative in food, pharmaceutical and cosmetic formulations. N-Butyl p-hydroxybenzoate is according to the ESIS database produced in amounts < 10 tones/year and is thus not a LPV substance. For the EUSES calculations a production volume of 10 tones per year has been used. n-Butyl p-hydroxybenzoate is readily biodegradable and has a relatively high potential for bioaccumulation (log Kow=3.57). Based EUSES calculations N-Butyl p-hydroxybenzoate is in the environment mainly distributed to surface waters in concentrations up to approx. 1 mg/L. N-Butyl p-hydroxybenzoate is expected to be found in fish, predators and human food in insignificant amounts. However, as n-Butyl p-hydroxybenzoate is used as a preservative in food and cosmetics a high direct human exposure is expected. N-Butyl p-hydroxybenzoate is thus considered as being of **Medium Concern.** None specifically regulatory or legal status for this substance was found. It is the opinium of the Scientific Commitee on Consumer Products (SCCP) that, viewing the current knowledge, there is no evidence of demonstrable risk for the development of breast cancer caused by the use of underarm cosmetics including parabens

3-Benzylidene camphor (3-BC) (CAS No.: 15087-24-8)

Human related effects
Rat in vivo study: Increase in uterus weight. LOED = 2 mg/kg body weight.day

Wildlife related effect
Fish in vivo study: Vitellogenin induction. ED10, ED50 and ED90 of 3-benzylidene camphor after 6 days (2 injections) were 6.4, 16 and 26 mg/kg/injection, resp

Chemical characteristics:
Molecular formula: C17 H20 O1

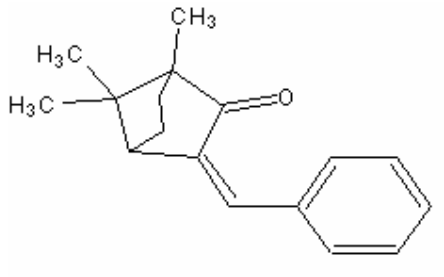

Table 1: Physical/chemical properties of 3-Benzylidene camphor (3-BC)

Parameter	Value	Unit	Reference
Molecular weight	240.35001	g/mol	
Melting point	109.87	ºC	EPISUITE
Boiling point	337.59	ºC	MST
Vapour pressure at 25 [°C]	0.005066	Pa	EPISUITE
Water solubility at 25 [°C]	0.6893	mg/L	EPISUITE
Octanol-water partition coefficient	4.67	-	MST
Koc	7540	L/kg	EPISUITE
BCF	385	-	EPISUITE
Henry's law constant	0.198	Pa·m^3/mole	EPISUITE
Biodegradation	Not readily bio-degradable	-	EPISUITE
t½(hydrolysis)		Year	
t½(air)	2.015	hr	EPISUITE

Table 2: Use, exposure and emissions

Parameter	Value	Unit
Tonnage of substance in Europe	50	Tonnes/year
Release to air	0.5	kg/year
Release to wastewater	1000	kg/year
Local PEC in surface water during emission episode (dissolved)	7.1999998	mg/l
Local PEC in fresh-water sediment during emission episode	445	mg/(kg wet weight)
Local PEC in agric. soil (total) averaged over 180 days	861	mg/(kg wet weight)
Local PEC in grassland (total) averaged over 180 days	316	mg/(kg wet weight)
Concentration in fish for secondary poisoning (fresh water)	183	mg/(kg wet weight)
Concentration in fish-eating marine top-predators	10.2	mg/(kg wet weight)
Local total daily intake for humans	38	mg/(kg·d)
Regional total daily intake for humans	6.9499998E-5	mg/(kg wet weight)

Conclusion
3-Benzylidene camphor is used as a UV sunscreen in cosmetics. 3-Benzylidene camphor is according to the ESIS database a LPV substance. For the EUSES calculations a production volume of 50 tones per year has been used. 3-Benzylidene camphor is not readily biodegradable and has a high potential to bio-

accumulate in the environment (log kow=4.67). 3-Benzylidene camphor is in the environment mainly distributed to surface water as well as sediments and agricultural soils. Based on EUSES estimations for secondary poisoning 3-Benzylidene camphor is expected to be found in fish and top predators in minor amount. A high human exposure is expected mainly due to the fact that the substance is used as a UV screen in cosmetics. 2,4-3-Benzylidene camphor is therefore considered as being of **High Concern.** None specifically regulatory or legal status for this substance was found.

Benzophenone-2 (Bp-2), 2,2',4,4'-tetrahydroxybenzophenone (CAS No.: 131-55-5)
2,2',4,4'-Tetrahydroxybenzophenone; Benzophenone-2 (2,2',4,4'-tetrahydroxybenzophenone; Methanone, bis(2,4-dihydroxyphenyl)-;

Human related effects
Rat in vivo study: Increased rat uterine weights. ED10=544.6 mg/kg body weight/day

Wildlife related effect
Fish in vivo study: Dose response related VTG induction. LOEC = 8783 mg/L

Chemical characteristics:
Molecular formula: C13 H10 O5

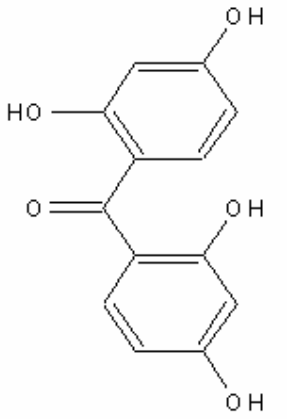

Table 1: Physical/chemical properties of Benzophenone-2 (Bp-2), 2,2',4,4'-tetrahydroxybenzophenone

Parameter	Value	Unit	Reference
Molecular weight	246.22	g/mol	
Melting point	186.56	ºC	EPISUITE
Boiling point	444.26	ºC	MST
Vapour pressure at 25 [°C]	6.586e-008	Pa	EPISUITE
Water solubility at 25 [°C]	398.5	mg/L	EPISUITE
Octanol-water partition coefficient	2.78	-	MST
Koc	7726	L/kg	EPISUITE
BCF	5.521	-	EPISUITE
Henry's law constant	3.66e-011	Pa·m^3/mole	EPISUITE
Biodegradation	Not readily bio-degradable	-	MST
t½(hydrolysis)		Year	
t½(air)	0.64	hr	EPISUITE

Table 2: Use, exposure and emissions

Parameter	Value	Unit
Tonnage of substance in Europe	50	Tonnes/year
Release to air	0.5	kg/year
Release to wastewater	1000	kg/year
Local PEC in surface water during emission episode (dissolved)	9.6400003	mg/l
Local PEC in fresh-water sediment during emission episode	68.800003	mg/(kg wet weight)
Local PEC in agric. soil (total) averaged over 180 days	85.599998	mg/(kg wet weight)
Local PEC in grassland (total) averaged over 180 days	24.1	mg/(kg wet weight)
Concentration in fish for secondary poisoning (fresh water)	3.04	mg/(kg wet weight)
Concentration in fish-eating marine top-predators	6.3199997E-2	mg/(kg wet weight)
Local total daily intake for humans	4.0700002	mg/(kg·d)
Regional total daily intake for humans	0.00000413	mg/(kg wet weight)

Conclusion

Benzophenone-2 (Bp-2), 2,2',4,4'-tetrahydroxybenzophenone is used as a UV sunscreen in cosmetics. Benzophenone-2 (Bp-2), 2,2',4,4'-tetrahydroxybenzophenone is according to the ESIS database a LPV substance. For the EUSES calculations a production volume of 50 tones per year has been used. Benzophenone-2 (Bp-2), 2,2',4,4'-tetrahydroxybenzophenone is not readily biodegradable and has a medium potential to bioaccumulate. Benzophenone-2 (Bp-2), 2,2',4,4'-tetrahydroxybenzophenone is in the environment mainly distributed to surface water as well as sediments and agricultural soils. Based on EUSES estimations for secondary poisoning Benzophenone-2 (Bp-2), 2,2',4,4'-tetrahydroxybenzophenone is not expected to be found in fish and top predators. A high human exposure is expected mainly due to the fact that the substance is used as a UV screen in cosmetics. Benzophenone-2 (Bp-2), 2,2',4,4'-tetrahydroxybenzophenone is therefore considered as being of **High Concern.** None specifically regulatory or legal status for this substance was found.

Boric acid (CAS No.: 10043-35-3)

Orthoboric acid; Orthoboric acid (H3BO3); Boracic acid; Borofax; Boron trihydroxide; hydrogen orthoborate; Kill-off; Kjel-sorb; three elephant; Trihydroxyborane;

Human related effects

Rat in vivo study: After a 4-wk administration by gavage, testis and epididymis wts. were decreased in the 300 and 500 mg/kg groups

Wildlife related effect

Amphibian in vivo study: Boric acid exerted reproductive toxicity in Xenopus laevis + transgenerational toxicity to the developing progeny.

Chemical characteristics:
Molecular formula: H3 O3 B1

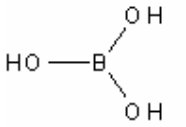

Table 1: Physical/chemical properties of Boric acid

Parameter	Value	Unit	Reference
Molecular weight	61.830002	g/mol	
Melting point	171	ºC	IUCLID
Boiling point	300	ºC	IUCLID
Vapour pressure at 25 [°C]	9.799e-015	Pa	EPISUITE
Water solubility at 25 [°C]	50000	mg/L	EPISUITE
Octanol-water partition coefficient	-0.757	-	IUCLID
Koc	35.04	L/kg	EPISUITE
BCF	543.5	-	EPISUITE
Henry's law constant	0	Pa·m^3/mole	EPISUITE
Biodegradation	Readily biodegradable	-	EPISUITE
t½(hydrolysis)		Year	
t½(air)	25.467	hr	EPISUITE

Table 2: Use, exposure and emissions

Parameter	Value	Unit
Tonnage of substance in Europe	50000	Tonnes/year
Release to air	375	kg/year
Release to wastewater	112500	kg/year
Local PEC in surface water during emission episode (dissolved)	2.3699999	mg/l
Local PEC in fresh-water sediment during emission episode	2.0799999	mg/(kg wet weight)
Local PEC in agric. soil (total) averaged over 180 days	0.0517	mg/(kg wet weight)
Local PEC in grassland (total) averaged over 180 days	1.7999999E-2	mg/(kg wet weight)
Concentration in fish for secondary poisoning (fresh water)	1.38	mg/(kg wet weight)
Concentration in fish-eating marine top-predators	0.21799999	mg/(kg wet weight)
Local total daily intake for humans	6.7000002E-2	mg/(kg·d)
Regional total daily intake for humans	0.0000163	mg/(kg wet weight)

Conclusion

Boric acid is used in consumer products as e.g. cosmetics and is according to the ESIS database a HPV substance. For the EUSES calculations a production volume of 50000 tones per year has been used. Boric acid is not bioaccumulative and is readily biodegradable in the environment. EUSES calculations for secondary poisoning shows that the substance is not accumulated in significant amounts in fish and top predators. A relatively high human exposure is however expected due to the defined use of the sub-

stance. Based on these evaluations Boric acid is considered as being of **Medium Concern.** Presently no EU classification is applied to Boric acid. A risk assessment on Boric acid is at the moment being performed by Austria. Proposed classification: R62; R63.

2,2-Bis(4-hydroxyphenyl)-n-butan = Bisphenol B (CAS No.: 77-40-7)

Human related effects
In vivo immature rat uterotrophic assay: Positive response in the uterotrophic assay. Dose reponse relationship (0, 2, 20 and 200 mg/kg)

Wildlife related effect
No or insufficient data gathered

Chemical characteristics:
Molecular formula: C16 H18 O2

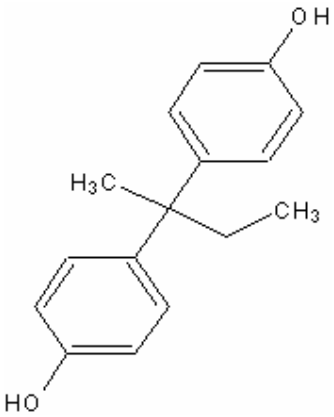

Table 1: Physical/chemical properties of 2,2-Bis(4-hydroxyphenyl)-n-butan = Bisphenol B

Parameter	Value	Unit	Reference
Molecular weight	242.32001	g/mol	
Melting point	102.5	ºC	EPISUITE
Boiling point	379.74	ºC	MST
Vapour pressure at 25 [°C]	3.293e-005	Pa	EPISUITE
Water solubility at 25 [°C]	29.23	mg/L	EPISUITE
Octanol-water partition coefficient	4.69	-	MST
Koc	149000	L/kg	EPISUITE
BCF	14.72	-	EPISUITE
Henry's law constant	1.23e-006	Pa·m^3/mole	EPISUITE
Biodegradation	Not readily biodegradable	-	MST
t½(hydrolysis)		Year	
t½(air)	1.571	hr	EPISUITE

Table 2: Use, exposure and emissions

Parameter	Value	Unit
Tonnage of substance in Europe	10	Tonnes/year
Release to air	9.0000004E-2	kg/year
Release to wastewater	180	kg/year
Local PEC in surface water during emission episode (dissolved)	0.73799998	mg/l
Local PEC in fresh-water sediment during emission episode	46.700001	mg/(kg wet weight)
Local PEC in agric. soil (total) averaged over 180 days	91.699997	mg/(kg wet weight)
Local PEC in grassland (total) averaged over 180 days	35	mg/(kg wet weight)
Concentration in fish for secondary poisoning (fresh water)	35.200001	mg/(kg wet weight)
Concentration in fish-eating marine top-predators	1.9	mg/(kg wet weight)
Local total daily intake for humans	4.1799998	mg/(kg·d)
Regional total daily intake for humans	0.0000294	mg/(kg wet weight)

Conclusion

Bisphenol B is component of Phenolic Resin which is thermosetting resin used as Adhesive and Reinforcement. Bisphenol B is used in many industrial applications. Bisphenol B is according to the ESIS database produced in low amount and is neither a HPV or LPV substance. For the EUSES calculations a production volume of 10 tones per year has been used. Bisphenol B is not readily biodegradable and has a high potential to bioaccumulate in the environment (log kow=4.69). Bisphenol B is in the environment mainly distributed to surface water as well as sediments and agricultural soils. Based on EUSES estimations for secondary poisoning Bisphenol B is expected to be found in fish and top predators in minor amount. A medium human exposure is expected. Bisphenol B is considered as being of **Medium Concern.** None specifically regulatory or legal status for this substance was found.

3,3'-Bis(4-hydroxyphenyl)phthalid = Phenolphthaleine (CAS No.: 77-09-8)

2-[Bis (4-hydroxyphenyl)methyl]benzoic acid; 3,3-bis(4-hydroxyphenyl)-1(3H)-isobenzofuranone; 3,3-bis(p-hydroxyphenyl)phthalide; Alophen; Espotabs; Ex-Lax; Feen-a-mint; feen-a-mint gum; Figsen; Laxettes; Phenolax; Phenolphthalein;

Human related effects

Rat and mice in vivo study. Exposure of mice to phenolphthalein in feed for 2 years resulted in increased incidences of atypical hyperplasia of the thymus in males and females, degeneration of the germinal epithelium of the testis in males, and ovarian hyperplasia in females. LOAEL=300 mg/kg

Wildlife related effect

No or insufficient data gathered

Chemical characteristics:
Molecular formula: C20 H14 O4

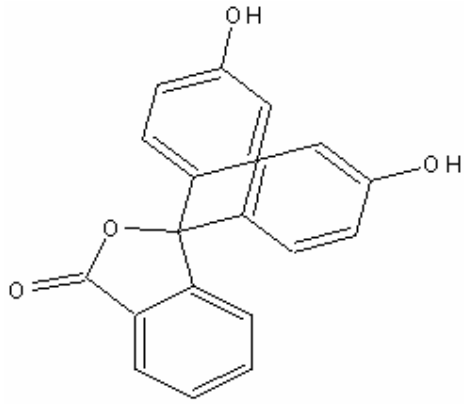

Table 1: Physical/chemical properties of 3,3'-Bis(4-hydroxyphenyl)phthalid = Phenolphthaleine

Parameter	Value	Unit	Reference
Molecular weight	318.32999	g/mol	
Melting point	262.5	ºC	EPISUITE
Boiling point	512.44	ºC	MST
Vapour pressure at 25 [°C]	8.373e-011	Pa	EPISUITE
Water solubility at 25 [°C]	400	mg/L	EPISUITE
Octanol-water partition coefficient	3.06	-	MST
Koc	307000	L/kg	EPISUITE
BCF	304.3	-	EPISUITE
Henry's law constant	9.1e-011	Pa·m^3/mole	EPISUITE
Biodegradation	Not readily biodegradable	-	EPISUITE
t½(hydrolysis)		Year	
t½(air)	1.525	hr	EPISUITE

Table 2: Use, exposure and emissions

Parameter	Value	Unit
Tonnage of substance in Europe	10	Tonnes/year
Release to air	0.1	kg/year
Release to wastewater	200	kg/year
Local PEC in surface water during emission episode (dissolved)	9.5100002	mg/l
Local PEC in fresh-water sediment during emission episode	91.900002	mg/(kg wet weight)
Local PEC in agric. soil (total) averaged over 180 days	132	mg/(kg wet weight)
Local PEC in grassland (total) averaged over 180 days	40.099998	mg/(kg wet weight)
Concentration in fish for secondary poisoning (fresh water)	1.04	mg/(kg wet weight)
Concentration in fish-eating marine top-predators	0.0218	mg/(kg wet weight)
Local total daily intake for humans	4.27	mg/(kg·d)
Regional total daily intake for humans	1.2199999E-6	mg/(kg wet weight)

Conclusion

Phenolphthalein is used as a laboratory reagent and acid-base indicator and in over-the-counter laxative preparations. Phenolphthalein is according to the ESIS database produced in amounts < 10 tones/year and thus not a LPV substance. For the EUSES calculations a production volume of 10 tones per year has been used. Phenolphthalein is not readily biodegradable and has potential to bioaccumulate (log Kow=3.06). Based on EUSES estimations Phenolphthalein is expected to be found in local surface water in relatively high concentrations (approx. 10 mg/L) as well as sediments and agricultural soils. Based on EUSES estimations for secondary poisoning and human intake Chlordimeform is expected to be found in fish, predators and human food in insignificant amounts. Based on the expected high concentrations in surface waters PCA is considered as being of **Medium Concern.** None specifically regulatory or legal status for this substance was found.

4,4'-Dihydroxybiphenyl = 4,4'-Biphenol (CAS No.: 92-88-6)

4,4[-Dihydroxybiphenyl; 4,4'-Dihydroxybiphenyl; 4,4'-Biphenol; 4,4'-Biphenyldiol; PPDP;

Human related effects

Rat in vivo study. Rat uterotrophic assay. Uterine weight increase. LOAEL=60 mg/kg body weight/day.

Wildlife related effect

In vitro study. Recombinant yeast assay for trout ER and trout hepatocyte cultures. Competitive binding to ER

Chemical characteristics:
Molecular formula: C12 H10 O2

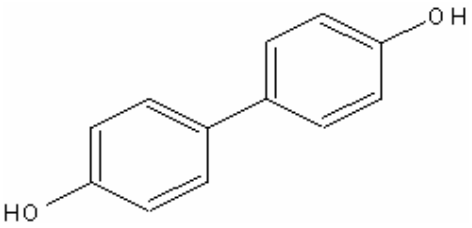

Table 1: Physical/chemical properties of 4,4'-Dihydroxybiphenyl = 4,4'-Biphenol

Parameter	Value	Unit	Reference
Molecular weight	186.21001	g/mol	
Melting point	126.99	ºC	EPISUITE
Boiling point	354.41	ºC	MST
Vapour pressure at 25 [°C]	1.533e-006	Pa	EPISUITE
Water solubility at 25 [°C]	798.2	mg/L	EPISUITE
Octanol-water partition coefficient	2.8	-	MST
Koc	16400	L/kg	EPISUITE
BCF	43.73	-	EPISUITE
Henry's law constant	4.54e-007	Pa·m^3/mole	EPISUITE
Biodegradation	Not readily bio-degradable	-	CHRIP NITE
t½(hydrolysis)		Year	
t½(air)	2.68	hr	EPISUITE

Table 2: Use, exposure and emissions

Parameter	Value	Unit
Tonnage of substance in Europe	10	Tonnes/year
Release to air	9.0000004E-2	kg/year
Release to wastewater	180	kg/year
Local PEC in surface water during emission episode (dissolved)	0.96399999	mg/l
Local PEC in fresh-water sediment during emission episode	7.02	mg/(kg wet weight)
Local PEC in agric. soil (total) averaged over 180 days	8.8299999	mg/(kg wet weight)
Local PEC in grassland (total) averaged over 180 days	2.51	mg/(kg wet weight)
Concentration in fish for secondary poisoning (fresh water)	0.56900001	mg/(kg wet weight)
Concentration in fish-eating marine top-predators	0.0118	mg/(kg wet weight)
Local total daily intake for humans	0.40900001	mg/(kg·d)
Regional total daily intake for humans	8.4800001E-7	mg/(kg wet weight)

Conclusion

4,4'-Biphenol used as sunscreens, preservatives, disinfectants, antioxidants, flavorings, or for perfumery. 4,4'-Biphenol is according to the ESIS database produced in amounts < 10 tones/year and is thus not a LPV substance. For the EUSES calculations a production volume of 10 tones per year has been used. 4,4'-Biphenol is not readily biodegradable and has a medium potential to bioaccumulate in the environ-

ment (log kow=2.8). 4,4'-Biphenol is in the environment mainly distributed to surface water in concentrations up to approx. 1 mg/L. Based on EUSES estimations for secondary poisoning and human intake 4,4'-Biphenol is expected to be found in fish, predators and human food in insignificant amounts, however, a high human exposure is expected due to the defined use of the substance. 4,4'-Biphenol is considered as being of **High Concern.** None specifically regulatory or legal status for this substance was found.

4-Hydroxybiphenyl = 4-Phenylphenol (CAS No.: 92-69-3)

[1,1'-Biphenyl]-4-ol; 4-Biphenylol; 4-hydroxybiphenyl; 4-Phenylphenol; Paraxenol; Biphenyl-4-ol;

Human related effects

Rat in vivo assay: Uterotrophic assay and Calbindin-D9k (CaBP-9K) mRNA expression were examd. in ovariectomized Sprague-Dawley female rats. 4-phenylphenol produced dose-dependent (10, 50, 200, and 400 mg/kg/day(increases in the uterine wts. of ovariectomized rats). LOAEL=200 mg/kg/day

Wildlife related effect

No or insufficient data gathered

Chemical characteristics:

Molecular formula: C12 H10 O1

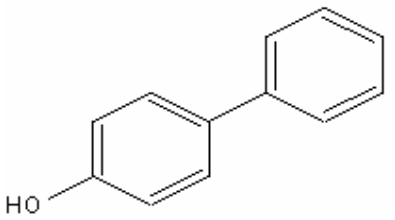

Table 1: Physical/chemical properties of 4-Hydroxybiphenyl = 4-Phenylphenol

Parameter	Value	Unit	Reference
Molecular weight	170.21001	g/mol	
Melting point	166	ºC	EPISUITE
Boiling point	305	ºC	EPISUITE
Vapour pressure at 25 [°C]	0.002306	Pa	EPISUITE
Water solubility at 25 [°C]	56.2	mg/L	EPISUITE
Octanol-water partition coefficient	3.2	-	EPISUITE
Koc	10120	L/kg	EPISUITE
BCF	25	-	EPISUITE
Henry's law constant	0.00436	Pa·m^3/mole	EPISUITE
Biodegradation	Not readily bio-degradable	-	CHRIP NITE
t½(hydrolysis)		Year	
t½(air)	4.695	hr	EPISUITE

Table 2: Use, exposure and emissions

Parameter	Value	Unit
Tonnage of substance in Europe	1000	Tonnes/year
Release to air	30	kg/year
Release to wastewater	24000	kg/year
Local PEC in surface water during emission episode (dissolved)	3.77	mg/l
Local PEC in fresh-water sediment during emission episode	42.5	mg/(kg wet weight)
Local PEC in agric. soil (total) averaged over 180 days	63.900002	mg/(kg wet weight)
Local PEC in grassland (total) averaged over 180 days	19.9	mg/(kg wet weight)
Concentration in fish for secondary poisoning (fresh water)	162	mg/(kg wet weight)
Concentration in fish-eating marine top-predators	3.4400001	mg/(kg wet weight)
Local total daily intake for humans	2.1600001	mg/(kg·d)
Regional total daily intake for humans	7.5099997E-5	mg/(kg wet weight)

Conclusion

4-Phenylphenol in an industrial intermediate. 4-Phenylphenol is according to the ESIS database a LPV substance. For the EUSES calculations a production volume of 1000 tones per year has been used. 4-Phenylphenol is not readily biodegradable and has potential to bioaccumulate in the environment (log

kow=3.2). 4-Phenylphenol is in the environment mainly distributed to surface water in concentrations up to approx. 4 mg/L. Based on EUSES estimations for secondary poisoning and human intake 4-Phenylphenol is expected to be found in fish, predators and human food in minor amounts. 4-Phenylphenol is considered as being of **Medium Concern.** None specifically regulatory or legal status for this substance was found.

p-Coumaric acid (PCA) (CAS No.: 7400-08-0)

3-(4-Hydroxyphenyl)propenoic acid; p-hydroxy-cinnamic acid; 4'-hydroxycinnamic acid;

Human related effects

Rat in vivo assay: 189 and 201% thyroid wts increase compared to control value. hyroid lesions in p-coumaric acid group were assocd. with significant increases in cellular proliferation as indicated by [3H]thymidine incorporation. In addn., the goitrogenic effect of p-coumaric acid was further confirmed by significant decreases (50%) in serum triiodothyronine (T3) and thyroxine (T4), and a parallel increase (90%) in serum TSH compared to control group. ED=0.25 mmol/kg/day

Wildlife related effect

No or insufficient data gathered

Chemical characteristics:
Molecular formula: C9 H8 O3

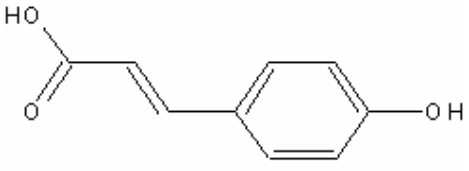

Table 1: Physical/chemical properties of p-Coumaric acid (PCA)

Parameter	Value	Unit	Reference
Molecular weight	164.16	g/mol	
Melting point	211.5	ºC	EPISUITE
Boiling point	329.8	ºC	MST
Vapour pressure at 25 [°C]	0.0001613	Pa	EPISUITE
Water solubility at 25 [°C]	18300	mg/L	EPISUITE
Octanol-water partition coefficient	1.79	-	EPISUITE
Koc	78.21	L/kg	EPISUITE
BCF	45.18	-	EPISUITE
Henry's law constant	1.36e-007	Pa·m^3/mole	EPISUITE
Biodegradation	Readily biode-gradable	-	MST
t½(hydrolysis)		Year	
t½(air)	2.481	hr	EPISUITE

Table 2: Use, exposure and emissions

Parameter	Value	Unit
Tonnage of substance in Europe	10	Tonnes/year
Release to air	0.1	kg/year
Release to wastewater	200	kg/year
Local PEC in surface water during emission episode (dissolved)	1.26	mg/l
Local PEC in fresh-water sediment during emission episode	3.4200001	mg/(kg wet weight)
Local PEC in agric. soil (total) averaged over 180 days	0.71100003	mg/(kg wet weight)
Local PEC in grassland (total) averaged over 180 days	0.27500001	mg/(kg wet weight)
Concentration in fish for secondary poisoning (fresh water)	0.0114	mg/(kg wet weight)
Concentration in fish-eating marine top-predators	0.00182	mg/(kg wet weight)
Local total daily intake for humans	0.131	mg/(kg·d)
Regional total daily intake for humans	2.9100001E-8	mg/(kg wet weight)

Conclusion

p-Coumaric acid (PCA) is a natural phenolic acid. PCA is according to the ESIS database produced in amounts < 10 tones/year and thus not a LPV substance. For the EUSES calculations a production vol-

ume of 10 tones per year has been used. PCA is readily biodegradable and has a low potential to bioaccumulate (log Kow=1.79). Based on EUSES estimations PCA is expected to be found in local surface water in concentrations up to approx. 1 mg/L. Based on EUSES estimations for secondary poisoning and human intake PCA is expected to be found in fish, predators and human food in insignificant amounts. PCA is considered as being of **Low Concern.** None specifically regulatory or legal status for this substance was found.

Phenol, (1,1,3,3-tetramethylbutyl)- = Octylphenol (CAS No.: 27193-28-8)

(1,1,3,3-tetramethylbutyl)phenol; octyl phenol; OP; (Tetramethylbutyl)phenol;

Human related effects

Rat in vivo study. Reduced sperm counts resulting from lowered plasma testosterone in male rats just after puberty. ED=3 mg/kg body weight.day

Wildlife related effect

Fish in vivo study. VTG induction + intersex gonads. LOEC=11.4 ug/L

Chemical characteristics:
Molecular formula: C14 H22 O1

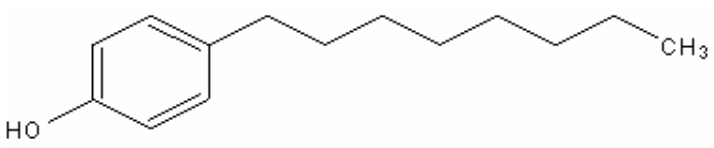

Table 1: Physical/chemical properties of Phenol, (1,1,3,3-tetramethylbutyl)- = Octylphenol

Parameter	Value	Unit	Reference
Molecular weight	206.33	g/mol	
Melting point	82.77	ºC	EPISUITE
Boiling point	310.93	ºC	MST
Vapour pressure at 25 [°C]	0.01301	Pa	EPISUITE
Water solubility at 25 [°C]	3.114	mg/L	EPISUITE
Octanol-water partition coefficient	5.5	-	MST
Koc	33010	L/kg	EPISUITE
BCF	5.623	-	EPISUITE
Henry's law constant	0.456	Pa·m^3/mole	EPISUITE
Biodegradation	Not readily bio-degradable	-	MST
t½(hydrolysis)		Year	
t½(air)	2.553	hr	EPISUITE

Table 2: Use, exposure and emissions

Parameter	Value	Unit
Tonnage of substance in Europe	10	Tonnes/year
Release to air	0.1	kg/year
Release to wastewater	200	kg/year
Local PEC in surface water during emission episode (dissolved)	5.1900001	mg/l
Local PEC in fresh-water sediment during emission episode	860	mg/(kg wet weight)
Local PEC in agric. soil (total) averaged over 180 days	1690	mg/(kg wet weight)
Local PEC in grassland (total) averaged over 180 days	659	mg/(kg wet weight)
Concentration in fish for secondary poisoning (fresh water)	672	mg/(kg wet weight)
Concentration in fish-eating marine top-predators	256	mg/(kg wet weight)
Local total daily intake for humans	167	mg/(kg·d)
Regional total daily intake for humans	0.000107	mg/(kg wet weight)

Conclusion

Octylphenol is used as a precursor to produce surfactants (ethoxylates) and in plastic products. Octylphenol is according to the ESIS database not a LPV substance. For the EUSES calculations a production volume of 10 tones per year has been used. Octylphenol is not readily biodegradable and has a high potential to bioaccumulate in the environment (log kow=5.5). Octylphenol is in the environment mainly distributed to surface water as well as sediments and agricultural soils. Based on EUSES estimations for secondary poisoning Octylphenol is expected to be of medium concern. A high local daily human intake is

expected (up to approx. 170 mg/kg/day). Octylphenol is considered as being of **High Concern.** The PBT properties have been assessed by the EU and it was concluded that Octylphenol does not fulfil the PBT criteria. The database for p-tert.-octylphenol is very comprehensive, including a high quality multi-generation study. The EU CMR group recently decided that Octylphenol should not be classified for re-protoxic effects.

Chlordimeform (CAS No.: 6164-98-3)

Acaron; Bermat; Dimethyl-N'-(2-methyl-4-chlorophenyl)formamidine; CDM; Chlordimeform; Chloro-phenamidine; Formamidine, N'-(4-chloro-o-tolyl)-N,N-dimethyl-; Fundal; Fundex; Galecon; Galecron; N'-(4-chloro-2-methylphenyl)-N,N-dimethylmethanimidamide; Ovatoxion; RS-141; Spanone;

Human related effects

In vivo rat study. Delay in breeding and a significant redn. in litter size. ED=50 mg/kg.

Wildlife related effect

No or insufficient data gathered

Chemical characteristics:

Molecular formula: C10 H13 CL1 N2

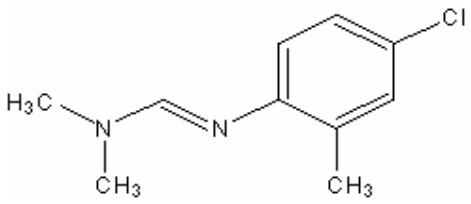

Table 1: Physical/chemical properties of Chlordimeform

Parameter	Value	Unit	Reference
Molecular weight	196.67999	g/mol	
Melting point	35	ºC	EPISUITE
Boiling point	156.5	ºC	EPISUITE
Vapour pressure at 25 [°C]	0.123056206	Pa	EPISUITE
Water solubility at 25 [°C]	270	mg/L	EPISUITE
Octanol-water partition coefficient	2.89	-	EPISUITE
Koc	3090	L/kg	EPISUITE
BCF	1524	-	EPISUITE
Henry's law constant	0.034857	Pa·m^3/mole	EPISUITE
Biodegradation	Not readily bio-degradable	-	EPISUITE
t½(hydrolysis)		Year	
t½(air)	1.416	hr	EPISUITE

Table 2: Use, exposure and emissions

Parameter	Value	Unit
Tonnage of substance in Europe	10	Tonnes/year
Release to air	9.0000004E-2	kg/year
Release to wastewater	180	kg/year
Local PEC in surface water during emission episode (dissolved)	0.958	mg/l
Local PEC in fresh-water sediment during emission episode	7.6900001	mg/(kg wet weight)
Local PEC in agric. soil (total) averaged over 180 days	9.71	mg/(kg wet weight)
Local PEC in grassland (total) averaged over 180 days	2.74	mg/(kg wet weight)
Concentration in fish for secondary poisoning (fresh water)	0.67400002	mg/(kg wet weight)
Concentration in fish-eating marine top-predators	0.0141	mg/(kg wet weight)
Local total daily intake for humans	0.134	mg/(kg·d)
Regional total daily intake for humans	7.5299999E-7	mg/(kg wet weight)

Conclusion

Chlordimeform is used as a insecticide. Chlordimeform is according to the ESIS database produced in amounts < 10 tones/year and thus not a LPV substance. For the EUSES calculations a production volume of 10 tones per year has been used. Chlordimeform is not readily biodegradable and has a medium potential to bioaccumulate (log Kow=2.89). Based on EUSES estimations Chlordimeform is expected to

be found in local surface waters in concentrations up to approx. 1 mg/L. Based on EUSES estimations for secondary poisoning and human intake Chlordimeform is expected to be found in fish, predators and human food in minor amounts. Chlordimeform is considered as being of **Low Concern.** Covered by Council Directive 91/414/EEC. No RAR has been provided and the substance is not included in the list for pesticides to be reviewed.

Cyclophosphamide (CAS No.: 50-18-0)

Cyclophosphoramide; Cytophosphane; 2-(bis(2-Chloroethyl)-amino)tetrahydro-2H-1,3,2-oxazaphosphorine 2-oxide; Cycloblastin; Cyclostin; Sendoxan; bis(2-Chloroethyl)phosphamide cyclic propanolamide ester; bis(2-Chloroethyl)phosphoramide cyclic propanolamide ester; N,N-bis(beta-Chloroethyl)-N',O-propylenephosphoric acid ester diamide; N-bis(beta-Chloroethyl)-N'O,trimethylenephosphoric acid ester diamide; N,N-Bis(beta-chloroethyl)-N',O-trimethylenephosphoric acid ester diamide; N,N-Bis(2-chloroethyl)-N',O-propylenephosphoric acid ester diamide; N,N-Di(2-chloroethyl)-N,O-propylene-phosphoric acid ester diamide; Semdoxan; Senduxan; sk 20501; tatrahydro-2-(Bis(2-chloroethyl)amino)-2H-1,3,2-oxazaphosphorine 2-oxide; (-)-Cyclophosphamide; Asta B 518; Clafen; Claphene; Cyclophosphamidum; cb 4564; Endoxan R; Endoxan-Asta; Endoxana; Endoxanal; Endoxane; Enduxan; Genoxal; Mitoxan; Cyclophosphamides; Procytox; Cyclophosphamide; N,N-Bis(2-Chloroethyl)tetrahydro-2H-1,3,2-Oxazaphosphorin-2-Amine, 2-Oxide; Cytoxan; Cyclophosphane; B 518; Neosar; 1-(bis(2-chloroethyl)amino)-1-oxo-2-aza-5-oxaphosphoridine; 2-(di(2-chloroethyl)amino)-1-oxa-3-aza-2-phosphacyclohexane 2-oxide; ASTA; N,N-bis(2-chloroethyl)-N'-(3-hydroxypropyl)phosphorodiamidic acid intramol. ester; tetrahydro-N,N-bis(2-chloroethyl)-2H-1,3,2-oxazaphosphorin-2-amine 2-oxide;

Human related effects

Rat in vivo assay: Decreased ovarian and uterin weight and reduction serum estradiol and progesterone. LOAEL=50 mg/kg body weight

Wildlife related effect

No or insufficient data gathered

Chemical characteristics:

Molecular formula: C7 H15 CL2 N2 O2 P1

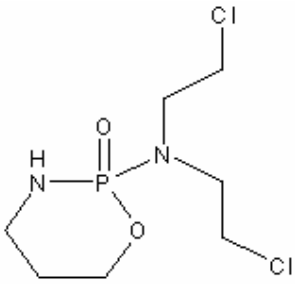

Table 1: Physical/chemical properties of Cyclophosphamide

Parameter	Value	Unit	Reference
Molecular weight	261.09	g/mol	
Melting point	51.5	ºC	EPISUITE
Boiling point	359.82	ºC	MST
Vapour pressure at 25 [°C]	0.005866	Pa	EPISUITE
Water solubility at 25 [°C]	40000	mg/L	EPISUITE
Octanol-water partition coefficient	0.63	-	EPISUITE
Koc	317.7	L/kg	EPISUITE
BCF	5856	-	EPISUITE
Henry's law constant	1.38e-006	Pa·m^3/mole	EPISUITE
Biodegradation	Not readily biodegradable	-	EPISUITE
t½(hydrolysis)		Year	
t½(air)	1.826	hr	EPISUITE

Table 2: Use, exposure and emissions

Parameter	Value	Unit
Tonnage of substance in Europe	10	Tonnes/year
Release to air	9.0000004E-2	kg/year
Release to wastewater	180	kg/year
Local PEC in surface water during emission episode (dissolved)	0.99699998	mg/l
Local PEC in fresh-water sediment during emission episode	1.26	mg/(kg wet weight)
Local PEC in agric. soil (total) averaged over 180 days	0.12800001	mg/(kg wet weight)
Local PEC in grassland (total) averaged over 180 days	3.0200001E-2	mg/(kg wet weight)
Concentration in fish for secondary poisoning (fresh water)	0.0174	mg/(kg wet weight)
Concentration in fish-eating marine top-predators	3.4900001E-4	mg/(kg wet weight)
Local total daily intake for humans	4.3499999E-2	mg/(kg·d)
Regional total daily intake for humans	2.12E-7	mg/(kg wet weight)

Conclusion

Cyclophosphamide is used as a insecticide as well as in chemotherapy. Cyclophosphamide is according to the ESIS database produced in amounts < 10 tones/year and thus not a LPV substance. For the EUSES calculations a production volume of 10 tones per year has been used. Cyclophosphamide is not readily biodegradable and has a low potential to bioaccumulate (log Kow=0.63). Based on EUSES estimations Cyclophosphamide is expected to be found in local surface water in concentrations up to approx. 1 mg/L. Based on EUSES estimations for secondary poisoning and human intake Cyclophosphamide is expected to be found in fish, predators and human food in minor amounts. Chlordimeform is considered as being of **Low Concern.** The substance is covered by Council Directive 91/414/EEC. No RAR has been provided and the substance is not included in the list for pesticides to be reviewed.

Mono-n-butylphthalate (CAS No.: 131-70-4)

Butyl Hydrogen Phthalate; Monobutyl phthalate;

Human related effects

Rat in vivo study: Decreased male anogenital distance and increased incidence of fetuses with undescended testes. LOAEL=250 mg/kg body weight/day

Wildlife related effect

No or insufficient data gathered

Chemical characteristics:

Molecular formula: C12 H14 O4

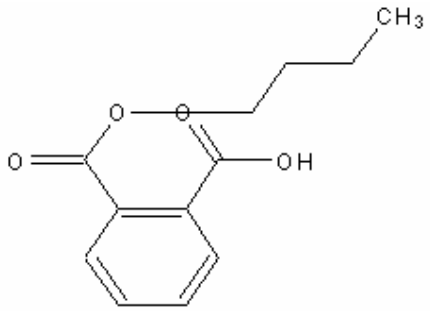

Table 1: Physical/chemical properties of Mono-n-butylphthalate

Parameter	Value	Unit	Reference
Molecular weight	222.24001	g/mol	
Melting point	117.82	ºC	EPISUITE
Boiling point	353.12	ºC	MST
Vapour pressure at 25 [°C]	0.001787	Pa	EPISUITE
Water solubility at 25 [°C]	125.7	mg/L	EPISUITE
Octanol-water partition coefficient	2.84	-	MST
Koc	43.49	L/kg	EPISUITE
BCF	523.4	-	EPISUITE
Henry's law constant	0.000166	Pa·m^3/mole	EPISUITE
Biodegradation	Readily biode-gradable	-	MST
t½(hydrolysis)	6.855	Year	EPISUITE
t½(air)	24.405	hr	EPISUITE

Table 2: Use, exposure and emissions

Parameter	Value	Unit
Tonnage of substance in Europe	10	Tonnes/year
Release to air	0.1	kg/year
Release to wastewater	200	kg/year
Local PEC in surface water during emission episode (dissolved)	1.23	mg/l
Local PEC in fresh-water sediment during emission episode	9.3800001	mg/(kg wet weight)
Local PEC in agric. soil (total) averaged over 180 days	2.48	mg/(kg wet weight)
Local PEC in grassland (total) averaged over 180 days	0.98199999	mg/(kg wet weight)
Concentration in fish for secondary poisoning (fresh water)	8.7499999E-2	mg/(kg wet weight)
Concentration in fish-eating marine top-predators	0.0142	mg/(kg wet weight)
Local total daily intake for humans	6.3100003E-2	mg/(kg·d)
Regional total daily intake for humans	7.5199999E-8	mg/(kg wet weight)

Conclusion

Consumer and industrial applications for phthalates are numerous and range from making nail polish flexible and screwdriver handles less brittle to helping make the time-release coatings on numerous pharmaceutical products. **Mono-n-butylphthalate** is according to the ESIS database produced in amounts < 10 tones/year and thus not a LPV substance. For the EUSES calculations a production volume of 10 tones per year has been used. Mono-n-butylphthalate is readily biodegradable and has a medium potential to bioaccumulate (log Kow=2.84). Based on EUSES calculations Mono-n-butylphthalate is not expected to be found in significant amounts in the environment (surface waters and sediments) and is not expected to give any problems in relation to secondary poisoning and human intake. Mono-n-butylphthalate is considered as being of **Low Concern.** None specifically regulatory or legal status for this substance was found. The related substance Dibutylphthalat is on the list of dangerous substances (Annex I to Directive 67/548/EEC)

Omethoate (CAS No.: 1113-02-6)

O,O-dimethyl S-(2-methylamino)-2-oxoethyl phosphorothioate; BAY 45432; Dimethoate oxon; dimethoate oxygen analog; dimethoxon; Dimethyl S-((methylcarbamoyl)methyl) phosphorothioate; Folimat; Omethoate; Phosphorothioic acid, O,O-dimethyl ester, S-ester with 2-mercapto-N-methylacetamide;

Human related effects

Mice in vivo study: Increase in body wt. and decreased testicle wt. The activities of AKP, ACP, LDH in mouse testicles significantly increased compared with the control.

Wildlife related effect

No or insufficient data gathered

Chemical characteristics:

Molecular formula: C5 H12 N1 O4 P1 S1

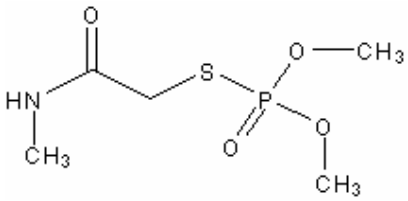

Table 1: Physical/chemical properties of Omethoate

Parameter	Value	Unit	Reference
Molecular weight	213.19	g/mol	
Melting point	87.02	ºC	EPISUITE
Boiling point	364.27	ºC	MST
Vapour pressure at 25 [°C]	0.0033063856	Pa	EPISUITE
Water solubility at 25 [°C]	1000000	mg/L	EPISUITE
Octanol-water partition coefficient	-0.75	-	EPISUITE
Koc	77.67	L/kg	EPISUITE
BCF	707.5	-	EPISUITE
Henry's law constant	4.62e-009	Pa·m^3/mole	EPISUITE
Biodegradation	Not readily biodegradable	-	MST
t½(hydrolysis)		Year	
t½(air)	4.938	hr	EPISUITE

Table 2: Use, exposure and emissions

Parameter	Value	Unit
Tonnage of substance in Europe	500	Tonnes/year
Release to air	3.75	kg/year
Release to wastewater	7500	kg/year
Local PEC in surface water during emission episode (dissolved)	2.5	mg/l
Local PEC in fresh-water sediment during emission episode	2.1900001	mg/(kg wet weight)
Local PEC in agric. soil (total) averaged over 180 days	0.0297	mg/(kg wet weight)
Local PEC in grassland (total) averaged over 180 days	7.0400001E-3	mg/(kg wet weight)
Concentration in fish for secondary poisoning (fresh water)	0.72600001	mg/(kg wet weight)
Concentration in fish-eating marine top-predators	0.0146	mg/(kg wet weight)
Local total daily intake for humans	3.5999998E-2	mg/(kg·d)
Regional total daily intake for humans	0.0000102	mg/(kg wet weight)

Conclusion

Omethoate is used as a pesticide. Omethoate is according to the ESIS database a LPV substance. For the EUSES calculations a production volume of 500 tones per year has been used. Omethoate is not readily biodegradable, but has a low potential to bioaccumulate (log Kow=-0.75). Based on EUSES esti-

mations Omethoate expected to be found in local surface water in concentrations up to 4 mg/L. As Omethoate is not potential bioaccumulative the substance is not expected to give any problems in relation to secondary poisoning. Omethoate is considered as being of **Low Concern.** Covered by Council Directive 91/414/EEC. No RAR has been provided and the substance is not included in the list for pesticides to be reviewed. Classification: XN;R21 T;R25 N;R50.

Mono 2 ethyl hexylphthalate (MEHP) (CAS No.: 4376-20-9)

1,2-benzenedicarboxylic acid, mono-(2-ethylhexyl)ester; MEHP; mono(2-ethylhexyl) phthalate; Mono-ethylhexyl phthalate; PHTHALIC ACID MONO-2-ETHYLHEXYL ESTER;

Human related effects

Rat in vivo study. Significantly decreased body weights and motile sperms. LOAEL=250 mg/kg body weight/day

Wildlife related effect

No or insufficient data gathered

Chemical characteristics:

Molecular formula: C16 H22 O4

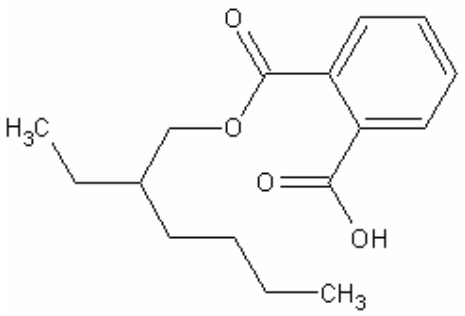

Table 1: Physical/chemical properties of Mono 2 ethyl hexylphthalate (MEHP)

Parameter	Value	Unit	Reference
Molecular weight	278.35001	g/mol	
Melting point	142.61	ºC	EPISUITE
Boiling point	392.54	ºC	MST
Vapour pressure at 25 [°C]	0.0001087	Pa	EPISUITE
Water solubility at 25 [°C]	1.492	mg/L	EPISUITE
Octanol-water partition coefficient	4.73	-	MST
Koc	463	L/kg	EPISUITE
BCF	3.162	-	EPISUITE
Henry's law constant	0.000514	Pa·m^3/mole	EPISUITE
Biodegradation	Not readily bio-degradable	-	MST
t½(hydrolysis)	10.671	Year	EPISUITE
t½(air)	11.066	hr	EPISUITE

Table 2: Use, exposure and emissions

Parameter	Value	Unit
Tonnage of substance in Europe	10	Tonnes/year
Release to air	0.1	kg/year
Release to wastewater	200	kg/year
Local PEC in surface water during emission episode (dissolved)	7.2800002	mg/l
Local PEC in fresh-water sediment during emission episode	483	mg/(kg wet weight)
Local PEC in agric. soil (total) averaged over 180 days	948	mg/(kg wet weight)
Local PEC in grassland (total) averaged over 180 days	361	mg/(kg wet weight)
Concentration in fish for secondary poisoning (fresh water)	41.799999	mg/(kg wet weight)
Concentration in fish-eating marine top-predators	2.29	mg/(kg wet weight)
Local total daily intake for humans	44.299999	mg/(kg·d)
Regional total daily intake for humans	0.0000294	mg/(kg wet weight)

Conclusion

Mono 2 ethyl hexylphthalate (MEHP) is the major DEHP metabolite. MEHP is according to the ESIS database produced in amounts < 10 tones/year and thus not a LPV substance. For the EUSES calculations a production volume of 10 tones per year has been used. MEHP is not readily biodegradable and has a high potential to bioaccumulate (log Kow=4.73). MEHP is in the environment mainly distributed to surface water as well as sediments and agricultural soils. Based on EUSES calculations MEHP is expected to give minor problems in relation to secondary poisoning and human intake. Due to the persistency and high bioaccumulation potential Mono-n-butylphthalate is considered as being of **Medium Concern.** None specifically regulatory or legal status for this substance was found.

A P P E N D I X A

Minutes from kick off meeting (17 November 2006)

Study on ED priority list with a focus on LPV chemicals – First meeting
Brussels 17 November 2005, Beaulieu 9 Salle D
MINUTES

Attendants: Katharina Spens (KS) The Commission, D4, Gitte Petersen (GIP) and Lise Samsøe-Petersen (LSP) both DHI.

1. Practical information (K. Spens)
   - Re: Organisational framework.
     - The position of the person who described this project is vacant and will be filled by February. Until the KS will manage this project.
   - Re: Financial issues
     - The project must be finalised in time for the invoice to be paid before December 31 2006. The implications of this were discussed and the attached time schedule was prepared.
   - Re: Database related issues
     - KS explained that the database for storage of raw data from the data collection, which was developed during the RPS BKH 2002 project, was available in an Access format.
     - This database will be used for reporting the data from the present project as well.
     - The Access database is not suitable as an internet databases. For this, ORACLE or FULCRUM formats have been recommeded. It was agreed that DHI will make a proposal for the work needed for converting the Access database into an internet compatible database.
     - .

2. Presentation of the work plan (DHI) and discussion, including identification of stakeholders
   - Identification of stakeholders- method. It was agreed that
     - KS will identify the stakeholders, which were contacted during the RPS BKH 2002 project.
     - KS will contact colleagues working with general chemicals (REACH), plant protection products, biocides and food.
     - DHI will contact DK EPA expert on REACH, Members of the OECD VMG-eco and Mammalian, member of recent EU EDC projects, and scientific colleagues

- Identification of stakeholders - timing. It was agreed that
  - The list of stakeholders for written consultation must be ready before Christmas.
  - The stakeholders for the consultation group will be identified when the answers on the questionnaires have been received.
  - The stakeholders for the consultation group need not to be established before summer 2006
  - Number of stakeholders should not be fixed

- Questionnaire for stakeholders - timing. It was agreed that
  - A draft questionnaire must be forwarded to KS on December 10.
  - The final questionnaire must be ready before Christmas.
  - The questionnaire will be distributed to the stakeholders immediately after New Year with a deadline for answers of 1 February 2006.

- Questionnaire for stakeholders - reporting. It was agreed that
  - The procedure and questionnaire as well as a summary of the answers will be described in the report.
  - The original answers of the questionnaires will be stores in electronic format and attached to the final report as a CD-ROM.

- List of substances to be assessed - method. It was agreed that
  - DHI needs the list of the 172 substances, which were not evaluated in the RPS BKH 2002 project. If it is not available on the CD with the Access database, KS will try to find it.
  - Otherwise, it must be constructed based on files containing the lists of the 553, the 435 and the 204 substances, described in the strategy. If relevant, DHI will request readable files with these lists.

- List of substances to be assessed - timing. It was agreed that
  - The list must be forwarded to D4February 28, 2006.
  - The discussion of the list will take place on a meeting between DHI and D4 on March 15, 2006.

- Reporting and meetings - timing. It was agreed that
  - Meeting (D4 + DHI): Discussion on list of substances to be evaluated: March 15, 2006
  - Interim report: May 31, 2006
  - Meeting (D4 + DHI): Discussion of interim report: June29, 2006
  - Draft final report: September 15, 2006
  - Stakeholder meeting: October 12, 2006
  - Meeting on draft final deliverable (D4 + DHI): October 13, 2006
  - Informal “close-to-final” report: November 10, 2006

- Comment from D4 on informal report November 17, 2006
- Final report a.o. deliverables: November 20, 2006
- Approval of final report a.o. deliverables: November 22, 2006

3. Conclusions and agreement of next steps. This is described above.
4. Any other business

– KS pointed out that there is a call for FP6, which is including the establishment of a database on EDCs. KS will contact the relevant colleagues in DG Research and inform them about this and previous projects.

2005.11.18 / Lise Samsøe-Petersen

TIME SCHEDULE
Study on enhancing the Endocrine Disrupter priority list with a focus on low production volume chemicals

Contractor: DHI Water & Environment, Agern Allé, DK-2970 Hørsholm, Denmark
DG ENV contact: Katharina Spens, unit D.4, tel. 02-2990521, katharina.spens@cec.eu.int

- 28 October 2005: Contract signed = starting date
- 17 November: kick-off meeting between contractor and D4 for discussing the tasks.
- 28 February 2006: Discussion on the list of substances to be evaluated between contractor and Commission.
- 31 May 2006: Interim report sent to Commission
- 29 June 2006: Discussion of interim report between contractor and Commission
- 15 September 2006: Submission of draft final report
- **12 October 2006: draft final report to be discussed in a stakeholder meeting in Brussels (Beaulieu), it is planned that contractor presents report, D4 should be present and report on the strategy)**
- 13 October 2006: Discussion of draft final deliverables (report and database) between contractor and Commission (D4)
- 10 November 2006: Informal “close-to-final” report
- 17 November 2006: Comments on informal report from D4 to DHI
- 20 November 2006: Final report including database to be submitted to Commission
- Final payment *has to be made* before 31 December (22 December in practice). The report therefore has to be approved by 22 November at the latest.

A P P E N D I X B

Minutes – List of substances (15 March 2006)

Study on ED priority list with a focus on LPV chemicals – Second meeting
Brussels 15 March 2006, Beaulieu 9 Salle D
MINUTES

Attendants: Katharina Spens (KS) The Commission, D4, Sylvain Bintein (SB) The Commission, C3 and Gitte Petersen (GIP) DHI.

1. Stakeholder response

GIP presented the aim of the project to SB and the outcome of the request to written stakeholders was briefly presented.
The questionnaire was sent to 160 potential stakeholders both by normal mail and by e-mail in December 2005. Two letters were received in return and 5 e-mails were received in return with a message on delivery failure. Thus in total the request was send to approximately 155 people.

Although the deadline for response was February 1st, quite many did not respond before late February/beginning of March. A total of 34 stakeholders responded to the questionnaire. This means that the answer percentage was approx. 22%, which is regarded as acceptable. Most of the response received was a kind reply that the questionnaire was received but that no further data could be provided (65%). However, among the replies, in which new information and data were provided, a total of 27 new substances has been suggested for addition to the list and thus to be evaluated in the present project

As the amount of information which followed the suggested new substances were quite diverse (from just a CAS No. to thorough information about the substances including attached references about EDC effects) it was decided to include all suggested chemicals in the present study and perform the evaluation on these as on the rest of the priority substances. The suggested substances to be added to the list are the following:

CAS No.	Substance name
556-67-2	Cyclotetrasiloxane
125116-23-6	Metconazole
81-14-1	1-tert-Butyl-3,5-dimethyl-2,6-dinitro-4-acetylbenzene
81-14-1	4,6-Dinitro-1,1,3,3,5-pentamethylindane
1222-05-5	1,3,4,6,7,8-Hexahydro-4,6,6,7,8,8-hexamethylcyclopenta(g)-2-benzopyrane
13171-00-1	4-Acetyl-1,1-dimethyl-6-tert.-butylindane
33704-61-9	6,7-dihydro-1,1,2,3,3-pentamethyl-4(5H)indanone
5466-77-3	2-ethyl-hexyl-4-methoxycinnamate
118-56-9	3,3,5-trimethyl-cyclohexyl salicilate
21245-02-3	2-ethyl-hexyl-4-dimethyl-aminobenzoate
36861-47-9	3-(4-Methylbenzylidene)camphor
131-57-7	2-hydroxy-4-methoxy-benzophenone
No CAS	Benzophenone derivatives
99-96-7	p-Hydroxybenzoic acid
99-76-3	Methyl p-Hydroxybenzoate
120-47-8	ethyl 4-hydroxybenzoate
94-13-3	n-propyl p-hydroxybenzoate
94-26-8	n-Butyl p-Hydroxybenzoate
15087-24-8	3-Benzylidene camphor (3-BC)

CAS No.	Substance name
131-55-5	Benzophenone-2 (Bp-2), 2,2',4,4'-tetrahydroxybenzophenone
10043-35-3	Boric acid
1303-96-4	Borax
1582-09-8	Trifluralin
13593-03-8	Chinalphos
100-02-7	4-nitrophenol
2581-34-2	3-methyl-4-nitrophenol
No CAS	4-nitro-3-phenylphenol

It was agreed that GIP will prepare a list of approx. 20 potential stakeholders who will be invited to participate as a stakeholder group. The participating stakeholders should as far as possible represent NGO, governmental institutions and researchers furthermore it was emphasised that as many countries as possible should be represented.
Concerning the stakeholders meetings KS will find out the financial issues related to travel money and accommodation.

2. Definition of Low Production Volume Chemicals

The definition of Low Production Volume Chemicals has not been made clear neither in the invitation to tender nor in the proposal. A clear definition was thus necessary and it was decided to use the definitions given in ESIS: European chemical substances information system which is the following:

HPVC (High Production Volume Chemical). A HPVC, is a chemical which is defined as being produced or imported in quantity of at least 1000 tonnes per year in EU by at least one Industry.
LPVC (Low Production Volume Chemical). A LPVC, is a chemical which has been produced or imported in EU with a tonnage >10 t/y but never more than 1000 t/y. By definition a LPV Chemical is a chemical which is not a HPV Chemical.

3. Priority list of substances to be evaluated

SB was invited by KS to attend the meeting for having his response on the stakeholder responses on new chemicals to be added to the list. Before the meeting SB reviewed the priority list and found that several substances were not included in the ECB-ESIS database and thus not in use any longer. He also found that few of the substances were HPVC and that the majority of the substances were neither HPVC nor LPVC substances. These are existing substances but produced or imported in amounts ≤10 tons per year. Based on this information it was decided that the priority list of substances should include HPVC and LPVC plus existing substances registered in the ECB-ESIS database although they were produced or imported in amounts ≤10 tons per year. It was agreed that GIP should make a close evaluation of the priority substances list including the 27 new substances added by the written stakeholders and classify the substances into the following categories:

1 = Current LPVC and HPVC according to ECB-ESIS.
2 = Substance found on ECB-ESIS list, but neither LPV or HPV (production volume < 10 ton/year)
3 = Substances not found on ECB-ESIS list and therefore excluded from the evaluation
4 = Substances with no CAS number and therefore excluded from the evaluation

For substances in category 3 and 4 it was decided that GIP should contact CEFIC to ask if they have any knowledge if the substances are still produced and if yes in which amounts. GIP will prepare a draft request to CEFIC and send it to KS. Based on this KS will prepare an official supporting letter from ENV.D4.
After the meeting GIP did categorise the priority list and based on this evaluation it was found that:

- Category 1 contains 10 HPVC and 26 LPVC.

- Category 2 contains 74 substances registered in ECB-ESIS database
- Category 3 contains 73 substances not registered ECB-ESIS database and thus excluded from the present study. Contact to CEFIC will be made for more information about these substances.
- Category 4 contains 17 substances without CAS No. and thus excluded from the present study. Contact to CEFIC will be made for more information about these substances.

The revised categorised list of substances is attached as Annex 1 (in this document Appendix D)

4. Time schedule

As the official start of the project is 2005.10.28 it is for administrative reasons necessary to send a draft final report by October 28. 2006. It was agreed that this report should include the draft final report planned to be send September 15 plus minutes from the stakeholder meeting October 12 and the meeting on draft final deliverables October 13.

5. DHI web page

It was agreed that DHI web page prepared for the present project needs to be updated. The background and state of the art shall be clearer. It was also agreed that the revised priority list including the latest categorisation shall be made available. GIP will take action.

2006.03.17 / Gitte Petersen

A P P E N D I X C

Minutes – List of substances (29 June 2006)

Study on ED priority list with a focus on LPV chemicals – Interim meeting
Brussels 29 June 2006, Beaulieu 9 Salle BU 9 0/191, 12.00-17.00
MINUTES

Attendants: DHI: Gitte Petersen; DG ENV: Katharina Spens, Sylvain Bintain, Reinhild Puergy

1. *DHI - Presentation of the work status – Preliminary Interim report and presentation of the database*

It was specified that, in the final report, the main objective of the present project shall be made clear i.e., the development of a database including collected data on endocrine disrupting properties of substances placed on the priority list/candidate list.

The definition of '**priority list**' was discussed under this agenda item: According to the Community Strategy for Endocrine Disrupters (1999), a short-term key action is the establishment of a priority list of substances for further evaluation of their role in endocrine disruption. The first study carried out in 2000 on the behalf of the Commission (BKH 2000) identified a candidate list of 553 substances. This candidate list of substances has thus since the BKH project in 2000 been named as 'The Priority List'. The meaning of this wording is that substances placed on 'The Priority List' have higher priority at data collection on endocrine disrupting properties than other substance lists, e.g. PBT substances, CMR substances etc.

Due to limitations in time, the number of substances to be evaluated, amount of data available and cost limitations, the evaluation of data collected on each individual substance is only based on a screening exercise. The wording 'priority list of substances' is therefore to be regarded as a starting point for further in depth evaluation of the endocrine disrupting properties of the substances placed on the priority list.

Gitte briefly presented the work status and it was decided that for the draft final report the following issues should be included and explained more thoroughly:

Task 3.2 Evaluation of data on their endocrine disrupting properties

- The methodology used for the evaluation of data shall be more thoroughly explained and shall be fully transparent. E.g., the categories defined in the previous work (BKH 2002) shall be included:

CAT1, 2, 3a or 3b	Category 1, 2, 3a or 3b
CAT 1.	At least one study providing evidence of endocrine disruption in an intact organism. Not a formal weight of evidence approach.
CAT 2.	Potential for endocrine disruption. *In vitro* data indicating potential for endocrine disruption in intact organisms. Also includes effects *in-vivo* that may, or may not, be ED-mediated. May include structural analyses and metabolic considerations
CAT 3a.	No scientific basis for inclusion in list (ED studies available but no indications on ED effects)
CAT 3b.	Substances with no or insufficient data gathered.

- It shall be clear that the Categorisation of the substances is based on evaluation of data at a screening level. E.g., a thorough literature research has been adopted, but mainly only the abstracts have been evaluated. In cases in which the information obtained from the abstracts were not sufficient for categorisation of the individual substance, a primarily reference check was performed (the original article was purchased). In the database, abstracts from the articles are copied and an evaluated extract of the effects obtained is reflected in the 'effect field'. It shall be clearly stated that the choices for the categorisation were made by the consultant, and apart from the definition on the categories given above, it may thus be regarded as subjective.
- According to the tender from the Commission and the proposal made by DHI, a clear statement on the data evaluation to be performed was given. Namely "*Starting points are the methodology developed in the RPS-BKH report (2002) and the database including the candidate substances which were identified in the BKH report of 2000, with data from background documents. The methodological approaches and evaluation of the selected substances with respect to endocrine disrupter potency towards humans and wildlife will be elaborated by the project team.*" As stated in the interim report, the evaluation of endocrine disrupting potential will be based on the following screening criteria:
    1. *Relevance of test parameter (with aspects such as relations between endocrine disrupting effects and mechanistic causes)*
    2. *Test reliability (validated protocols; experimental design; suitability, health and life stage of test species; statistics. Ranked indication of Data Quality (DQ 1-4). DQ: good data quality, fulfilling all (important) criteria; DQ2: Sufficient Data Quality, study fulfilling most of the (important) criteria; DQ3: Insufficient Data Quality, study cannot be used for identification; and DQ4: Not evaluated*
    3. *Dose-response relationship or indications of effects thresholds*
    4. *Endocrine disruption potency (including a categorization of the chemicals into 3 groups: 1. Evidence for endocrine disrupting (ED) effect; 2. Potential ED effect; 3. No evidence for ED effect)*
    5. *Comparison with systemic toxicity (Standard toxicity data –NOECs/LOECs, E(L)C50s, NOALs/LOAELs from RTECS, ECOTOX (AQUIRE), DOSE and Vershuren databases)*
- As the present work is based on a screening of available data for the substances on the priority list (a total of 109 substances) and as the quality of the available data is not standardised but quite diverse, a description of a more standardised procedure than the one

given above can be difficult. It was agreed that, in future, in depth evaluations of the collected data the criteria and the methodology for evaluation of the substances as having endocrine disrupting properties shall be well defined and fully transparent. In the present work a preliminary description and set up of a standard operating procedure (SOP) for the update of the database and the inclusion and exclusion of substances on the working list shall as far as possible be included.

2. Financial status

- *Interim report payment*

It was agreed that Reinhild will send the forwarded interim report for approval and, in 4 weeks time, it should be possible for DHI to forward an invoice for the interim payment (EUR 40,000.00) to the Commission.

- *Amount of time until this date and final invoice*

Gitte presented the amount of time used until date and it was briefly discussed that as far the revised time schedule (see item 3) is not exceeded, there should be no problems in having the final invoice paid before 31.12.06.

1. Revised time schedule

Gitte presented the revised time schedule forwarded for the meeting and the following dates were agreed:

- 01.10.2006: Draft final report shall be sent to Reinhild
- 08.10.2006: Draft final report available on the web at the DHI-web page (http://projects.dhi.dk/Endocrine_Disrupter/testsite/) for stakeholder response
- 08.11.2006: Response back from stakeholders
- 17.11.2006: DHI/DG ENV meeting: Discussion of final deliverables
- 20.11.2006: Final report

It was agreed that at the 4th meeting (17.11.2006) Reinhild will invite colleagues specifically interested in endocrine disrupting chemicals to participate.

According to the contract, a final report shall be available to the Commission by 28.10.2006. Reinhild will check up if the above time schedule will give any problems in this respect.

2. Stakeholder meeting

Due to accommodation and travel expenses in relation to a stakeholder meeting it was decided not to have a physical meeting but instead have web-based stakeholder responses. Thus stakeholders and experts from a list, based on the one used for the written consultation, will be invited to go through the draft final report and collected data on selected CAT 1 chemicals in the database. The list will be provided by Reinhild after discussion with Gitte. It will be available on 31. August latest. If there are more than 35 stakeholders are commenting, the potential revision work will be divided between DHI and DG ENV.

As stated above, the draft final report will be made available for selected stakeholders by 08.10.2006 and deadline for response will be 08.11.2006.
Sylvain suggested that the substances evaluated in the present project are checked to ensure that they are not already regulated by other current community legislation (e.g. Dir 76/769/EEC or REG 793/93/EEC or DIR 91/414/EC).

3. DHI EDS Website comments

Reinhild will correct the link (http://projects.dhi.dk/Endocrine_Disrupter/testsite/) and make sure that it will be made more visible on the EEC web page than presently.
The preliminary quotation for transformation of the Access database to either SQL or an Oracle database made by DHI was briefly discussed. According to Bjørn Hansen (who was contacted after the meeting), this work might be performed by ECB (*Reinhild please correct me here*) and until this has been clarified, DHI will not provide a final quotation. It was briefly discussed that due to the fact that the present evaluation of the available data and substances in the database is based on a screening level, there might be a second project aiming at update and maintenance of an iterative EDC priority list. However, as long as the Community Strategy for Endocrine Disrupting substances are not perfectly clear it was decided not to discuss this item further.

4. How to proceed further with substances lacking info on Category 3 and 4 substances. Outcome of Bjorn Hansen's contact to CEFIC

There was still no response from CEFIC. Bjørn Hansen was contacted after the meeting and once more he will try to get a reply. The final cut for response from CEFIC is 15.07.2006. It was decided that if no reply was obtained, the categories 3 and 4 substances (substances presently not included in the ESIS database and substances without CAS number) will not be included in the present evaluation.

5. *Discuss perspectives how to proceed with the elaborated knowledge about EDS*

Gitte presented the proposal "**The EU dynamic priority list/candidate list of substances with potential endocrine disrupting effects – proposal for ensuring a dynamic process**" forwarded to the Commission by the Danish Environmental Protection Agency, October 2003. The proposal was briefly discussed and it was decided that Reinhild will distribute the paper to relevant people at DG ENV and thereby try to make the EU strategy on EDCs more exposed in order to ensure a prioritisation of the EDC area. The proposal is attached as a pdf.file to the e-mail forwarded to Reinhild with the present minutes from the 3rd meeting.

A P P E N D I X D

Minutes. Discussion on final deliverables. 8 December 2006

Study on ED priority list with a focus on LPV chemicals – Discussion of draft final deliverables, i.e. report, database list

Brussels 8 December 2006, Beaulieu 9 Salle BU 9 0/191, 09.30-16.00

MINUTES

Attendants:; DG ENV: Sylvain Bintain and Reinhild Puergy DHI: Kim Gustavson and Gitte Petersen

1. Stakeholder response

Stakeholders and experts from the list, based on the one used for the written consultation, were invited to go through the draft final report and collected data on selected CAT 1 chemicals in the database. An invitation to go through the report was forwarded to the stakeholders by November 3 2006 and as stated in the invitation the draft final report was made available on the web site: (http://projects.dhi.dk/Endocrine_Disrupter/testsite/) by November 15.

Of the 141 stakeholders contacted 9 did respond by e-mail and approx 5 did respond by phone. The stakeholders that responded by phone did not have any comments to the report. Most of the comments received by e-mail were mainly minor. Major comments and criticism were received by the industry (CEFIC and European Crop Protection Association). Reinhild will have a meeting with CEFIC (Germot Klotz) before Christmas and comment the issues raised by CEFIC and European Crop Protection Association.

At the meeting all comments received were handled and discussed one by one and it was agreed that most of the comments received are appreciated very much and that they as far as possible will be taken into consideration in the final report.

Beside taking the comments received into account in the final report the following specific corrections were agreed to be performed:

- A table with an overview of the systemic toxicity shall be included
- In the summary a clear overview of the substances evaluated in the present study and previous studies (BKH 2000 and RPS-BKH 2002) shall be given
- In the summary a clear 'break down' of the 553 candidate substances shall be given
- In the summary it shall be clearly described that the present evaluation is the last out of 3 evaluations of substances placed on the EU candidate list and that the primary goal is the establishment of an EU priority-list on which further in depth evaluation of the endocrine properties shall be performed: 553 candidate substances => Evaluation at a screening level (BKH 2000 + RPS-BKH 2003 + DHI 2006)=> Priority list (CAT 1 substances) => Future in depth evaluation.
- The methodology was criticised by CEFIC. It shall therefore be clearly stated that due to the continuation of the project (last out of 3 evaluations on the EU candidate list) the methodology used is comparable to the methodology used in the RPS-BKH 2002 project.
- In the summary and throughout the report it shall be clearly indicated that the present evaluation of the endocrine properties has been based on a screening level, that the evaluation shall be seen in line with previous studies and that the evaluations shall NOT be seen as risk assessments

- In the presentation of the evaluated substances e.g., figures and tables the substances shall be ordered by ascending CAS numbers.
- The use category of CAT 1 substances listed in table 5.3 shall be included in the table
- The tonnage level used in the EUSES calculations shall be checked in relation to the tonnage level (HPV/LPV) given in the ESIS database.
- General editing (Headlines and wordings, annex with 2. stakeholder request)

2. Other issues
Sylvain joined the meeting in the afternoon and the legal status of the evaluated CAT 1 substances were discussed. Among others Sylvain pointed out that Trifluralin was a POP candidate and that 4-nonylphenol has been restricted in the EU for some time.

It was agreed that the legal status for all substances evaluated as CAT 1 substances in the present evaluation are checked carefully and that the legal status of the CAT 1 substances shall be described in the datasheets of all 34 CAT 1 substances.

3. Discuss perspectives how to proceed with the elaborated knowledge about EDS
Reinhild informed that ECB-Ispra are interested in taking the lead for the update of the Assess database to an ORACLE database. The hosting and future in depth evaluation of the priority substances will most probably be outsourced.

2006.12.11
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A P P E N D I X F

Questionnaire for identification of new candidate LPVC

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Dear

Study on enhancing the Endocrine Disrupter priority list with focus on low production volume chemicals

The European Commission DG Environment has contracted DHI Water and Environment to perform a study on enhancing the Endocrine Disrupter priority list with focus on Low Production Volume Chemicals (LPVC).

The project includes two main tasks:

- Identify new candidate substances that are LPVC and may have endocrine disrupting properties
- Collect data on LPVC identified in this and previous studies in order to assess the potential of endocrine disruption of each candidate substance

For this, DHI needs the co-operation from academia, industry and governments. We have identified you, as a potential stakeholder because you belong to one or several of the following groups:

- National focal points in EU Member States
- NGOs
- Industrial branch organisations, e.g. CEFIC, EUROCHLOR, ECETOC and individual industries
- Experts involved in international work regarding endocrine disrupters, e.g. OECD Validation Management Groups for Ecotoxicity Tests (VMG-eco) and Mammalian toxicity test (VMG-mammal) of the Task Force on Endocrine Disrupters Testing and Assessment (EDTA)
- Participants in EU research projects on endocrine disrupters e.g., CREDO, EDEN, FIRE
- Stakeholders consulted for previous studies to set up the ED priority list

As belonging to one of the above groups, we expect you to have access to specific knowledge on endocrine disrupting chemicals and the effects related to these. Therefore, we would like to invite you to join this project as a stakeholder.

Background

In December 1999, the European Commission adopted the Communication Community Strategy for Endocrine Disrupters (COM(1999)706). One of the actions identified in the Strategy is the establishment of a priority list of substances for further evaluation of their role in endocrine disruption.

In two previous studies (BKH-report 2000 and RPS-BKH report 2002[1]) a preliminary candidate list of 553 substances was evaluated. The assessment exercise concentrated mainly on substances, which were either High Production Volume Chemicals and/or highly persistent in the environment.

In their evaluation, the Scientific Committee on Toxicity, Eco-toxicity and Environment (CSTEE) concluded that the RPS-BKH report provided a significantly improved assessment methodology in comparison with the previous BKH report. The Committee was, however, of the opinion that LPVC of high endocrine potency or with high emission rates were not sufficiently covered in the evaluation[2].

Aims of this project and our request for information

The overall objective of the present project is to enhance the Endocrine Disrupter priority list with special focus on LPVC. The study will be based on the candidate substance list, which was identified in the BKH-project and those of the candidate substances, which were not evaluated in the RPS-BKH-project. An overview of the chemicals in question is presented in Table 1 and from this it appears that 173 substances will be evaluated in the present project. The candidate list including all 553 substances and their present status of evaluation is available on the web site: http://projects.dhi.dk/Endocrine_Disrupter.

Table 1. Overview of candidate list substances

Selection criteria	**No. substances**	**No substance**
Original candidate list of substances with ED effects	*565*	*565*
Excluded at the ED expert meeting of 1999	11	
Candidate list of substances with ED effects, 2000	*553*	*553*
HPV already restricted to bans (109) + in depth evaluation (9)	118	
Remaining substances	*435*	*435*
HPV and/or persistent and/or high exposure (in depth evaluation RPS-BKH-2002)	204	
Group names (not to be evaluated)	13	
Mixtures or polymers (not to be evaluated)	41	
Substances two times in list (not to be evaluated)	4	
Remaining substances to be evaluated in the present project	**173**	**173**

In the IUCLID database, 7829 chemicals are registered as LPVC but no information regarding their potential endocrine disrupting effects is registered. One of the aims of this project is to identify additional substances with endocrine disrupting properties among these 7829 chemicals. For this identification, we ask for your cooperation.

Therefore, we kindly ask you as a stakeholder to assist us in:

6. Identifying new candidate substances, which are not included in the present list
7. Collecting data regarding endocrine disrupting effects on any of the chemicals to be evaluated in the present project

In order to facilitate your contribution to the project we have prepared a table (Appendix 1) for information delivering. We kindly ask you to fill in your data and knowledge on chemicals, which you

[1] http://europa.eu.int/comm/environment/endocrine/strategy/substances_en.htm#r
[2] http://europa.eu.int/comm/health/ph_risk/committees/sct/documents/out208_en.pdf

identify as new candidate substances, and/or regarding the 173 substances, which have already been identified for evaluation in the project.

We need the following information on each chemical:

- Production volume
- Persistence in the environment
- Evidence of endocrine disruption from literature data (including reference)
- Exposure considerations

We kindly ask you to provide answers (preferably by e-mail) to one of the below e-mail addresses. The deadline for the answers is 1 February, 2006. We thank you in advance for your cooperation and are looking forward hearing from you.

Yours sincerely
DHI Water & Environment

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Appendix 1

Questionnaire scheme for ***Study on enhancing the Endocrine Disrupter priority list with focus on low production volume chemicals***

Name and contact details (for possible contact regarding clarification of answers)			
Substance name:			
CAS no.			
SMILE notation:			
Other information:			
Production volume	Persistence in the environment	Evidence of endocrine disruption from literature data (including reference)	Exposure considerations

A P P E N D I X G

Request to CEFIC

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CEFIC
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Belgium

Att.: Simon Webb (I am not sure if he is the right person to contact)

Dear Simon Webb??

Re.: Study on enhancing the Endocrine Disrupter priority list with focus on low production volume chemicals

The European Commission DG Environment has contracted DHI Water and Environment to perform a study on enhancing the Endocrine Disrupter priority list with focus on Low Production Volume Chemicals (LPVC).

Background
In December 1999, the European Commission adopted the Communication Community Strategy for Endocrine Disrupters (COM(1999)706). One of the actions identified in the Strategy is the establishment of a priority list of substances for further evaluation of their role in endocrine disruption.

In two previous studies (BKH-report 2000 and RPS-BKH report 2002[3]) a preliminary candidate list of 553 substances was evaluated. The assessment exercise concentrated mainly on substances, which were either High Production Volume Chemicals and/or highly persistent in the environment.

In their evaluation, the Scientific Committee on Toxicity, Eco-toxicity and Environment (CSTEE) concluded that the RPS-BKH report provided a significantly improved assessment methodology in comparison with the previous BKH report. The Committee was, however, of the opinion that LPVC of high endocrine potency or with high emission rates were not sufficiently covered in the evaluation[4].

Aims of this project and our request for information

[3] http://europa.eu.int/comm/environment/endocrine/strategy/substances_en.htm#r
[4] http://europa.eu.int/comm/health/ph_risk/committees/sct/documents/out208_en.pdf

The overall objective of the present project is to enhance the Endocrine Disrupter priority list with special focus on LPVC. The study will be based on the candidate substance list, which was identified in the BKH-project and those of the candidate substances, which were not evaluated in the RPS-BKH-project. The candidate list of substances to be evaluated in the present project consists of approx. 200 substances.

After a close evaluation of the priority list of substances it was found that 73 substances were not registered in the ECB-ESIS database (http://ecb.jrc.it/esis/) and thus regarded as chemicals not in use any longer and furthermore, that 17 substances were without CAS No. Please find these substances attached as Annex 1 and Annex 2.

We kindly ask if CEFIC could assist us in identifying if the substances listed in Appendix 1 and 2 are still produced and if yes in which amounts.

We kindly ask you to provide answers (preferably by e-mail) to the e-mail address below. We thank you for your kind cooperation and are looking forward hearing from you.

Yours sincerely
DHI Water & Environment

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A P P E N D I X H

Request for comments to the draft final deliverables

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Dear

Re.: Study on enhancing the Endocrine Disrupter priority list with focus on low production volume chemicals

As previously informed, the European Commission - DG Environment has contracted DHI Water & Environment to perform a study on enhancing the Endocrine Disrupter priority list with focus on Low Production Volume Chemicals (LPVC), which will be finalised at the end of this year

Background
In December 1999, the European Commission adopted the Communication Community Strategy for Endocrine Disrupters (COM(1999)706). One of the actions identified in the Strategy is the establishment of a priority list of substances for further evaluation of their role in endocrine disruption.

In two previous studies (BKH-report 2000 and RPS-BKH report 2002[5]), a preliminary candidate list of 553 substances was evaluated. The assessment exercise concentrated mainly on substances, which were either High Production Volume Chemicals and/or highly persistent in the environment.

In their evaluation, the Scientific Committee on Toxicity, Eco-toxicity and Environment (CSTEE) concluded that the RPS-BKH report provided a significantly improved assessment methodology in comparison with the previous BKH report. The Committee was, however, of the opinion that LPVC of high endocrine potency or with high emission rates were not sufficiently covered in the evaluation[6].

Aims of this project and our request for information
The overall objective of the present project is to enhance the Endocrine Disrupter priority list with special focus on LPVC. The study is based on the candidate substance list, which was identified in the BKH project and those of the candidate substances, which were not evaluated in the RPS-BKH project. The evaluated data are entered in the Access database developed in the RPS-BKH 2002 project.

We are now close to finalising the study and would therefore kindly invite you to go through the draft final report and the collected data on selected CAT 1 chemicals in the database. Your comments would be highly appreciated.

[5] http://europa.eu.int/comm/environment/endocrine/strategy/substances_en.htm#r

[6] http://europa.eu.int/comm/health/ph_risk/committees/sct/documents/out208_en.pdf

The draft final report and database will be made available for your evaluation on the web site: http://projects.dhi.dk/Endocrine_Disrupter/testsite/ on 15 November 2006.

We kindly ask you to provide your response (preferably by e-mail) to the below e-mail address. **The deadline for the answers is 1 December 2006.**

We thank you in advance for your cooperation and are looking forward to hearing from you.

Yours sincerely
DHI Water & Environment

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A P P E N D I X I

Revised list of priority substances for evaluation in the present study

According to ECB-ESIS database, current LPV and HPV substances. LPV: 10-<1000 ton/year; HPV >1000 ton/year
Will be evaluated in the present study

No.	CAS	Name	LPV/HPV	Existing labeling (ESIS)
302	92-69-3	4-Hydroxybiphenyl = 4-Phenylphenol	LPV	
244	3115-49-9	4-nonylphenoxy acetic acid	LPV	
271	131-18-0	Di-n-pentylphthalate (DPP) = Dipentylphthalate	LPV	R60/61: May impair fertility / May cause harm to unborn child
291	131-54-4	2,2'-Dihydroxy-4,4'-dimethoxybenzophenon	LPV	
293	131-56-6	2,4-Dihydroxybenzophenon = Resbenzophenone	LPV	
295	620-92-8	Bis(4-hydroxyphenyl)methane	LPV	
320	90-15-3	1-Naphthol	HPV	
429	84-69-5	Diisobutylphthalate	HPV	
551	1634-04-4	methyl tertiary butyl ether (MTBE)	HPV	
158	79-44-7	Dimethyl carbamyl chloride	LPV	
182	2597-03-7	Elsan = Dimephenthoate	LPV	
184	2540-82-1	Formothion	LPV	
187	1113-02-6	Omethoate	LPV	
205	314-40-9	Bromacil	LPV	
190	13593-03-8	Quinalphos = Chinalphos	LPV	
169	96-45-7	Ethylene Thiourea (ETU)	LPV	R61: May cause harm to unborn child
New-4	556-67-2	Cyclotetrasiloxane	HPV	
New-8	81-14-1	1-tert-Butyl-3,5-dimethyl-2,6-dinitro-4-acetylbenzene	LPV	
New-8	1222-05-5	1,3,4,6,7,8-Hexahydro-4,6,6,7,8,8-hexamethylcyclopenta(g)-2-benzopyrane	HPV	
New-8	13171-00-1	4-Acetyl-1,1-dimethyl-6-tert.-butylindane	LPV	
New-8	5466-77-3	2-ethyl-hexyl-4-methoxycinnamate	HPV	
New-8	118-56-9	3,3,5-trimethyl-cyclohexyl salicilate	LPV	
New-8	21245-02-3	2-ethyl-hexyl-4-dimethyl-aminobenzoate	LPV	
New-8/10	36861-47-9	3-(4-Methylbenzylidene)camphor	LPV	
New-8	131-57-7	2-hydroxy-4-methoxy-benzophenone	LPV	
New-8	99-96-7	p-Hydroxybenzoic acid	LPV	
New-8	99-76-3	Methyl p-Hydroxybenzoate	LPV	
New-8	120-47-8	ethyl 4-hydroxybenzoate	LPV	
New-8	94-13-3	n-propyl p-hydroxybenzoate	LPV	
New-10	15087-24-8	3-Benzylidene camphor (3-BC)	LPV	
New-10	131-55-5	Benzophenone-2 (Bp-2), 2,2',4,4'-tetrahydroxybenzophenone	LPV	
New-12	10043-35-3	Boric acid	HPV	
New-17	1582-09-8	Trifluralin	HPV	
New-28	100-02-7	4-nitrophenol	HPV	
New-28	106-44-5	4-nitro-3-phenylphenol	HPV	

Substance found on ECB-ESIS list, but neither LPV or HPV (Production volume < 10 ton/year	
Will be evaluated in the present study	

No.	CAS	Name	Existing labeling (ESIS)
549	485-72-3	Formononetin	
548	491-80-5	Biochanin A	
300	1806-29-7	2,2'-Dihydroxybiphenyl = 2,2'-Biphenol	
301	92-88-6	4,4'-Dihydroxybiphenyl = 4,4'-Biphenol	
309	2051-60-7	PCB 1 (2-Chlorobiphenyl)	
311	2050-68-2	PCB 15 (4,4'-Dichlorobiphenyl)	
313	2051-61-8	PCB 2 (3-Chlorobiphenyl)	
315	2051-62-9	PCB 3 (4-Chlorobiphenyl)	
233	104-51-8	n-Butylbenzene	
235	25167-81-1	Dichlorophenol	
238	87-26-3	2-sec-Pentylphenol = 2-(1-Methylbutyl)phenol	
239	1131-60-8	4-Cyclohexylphenol	
240	1009-11-6	4-Hydroxy-n-butyrophenone	
241	70-70-2	4-Hydroxypropiophenone	
242	104-40-5	4-Nonylphenol (4-NP)	
243	20427-84-3	4-Nonylphenoldiethoxylate (NP2EO)	
245	99-71-8	4-sec-Butylphenol = 4-(1-Methylpropyl)phenol	
247	7786-61-0	4-vinylguaiacol (4-VG)	
248	2628-17-3	4-vinylphenol (4-VP)	
249	27986-36-3	Ethanol, 2-(nonylphenoxy)-	
250	1322-97-0	Ethanol, 2-(octylphenoxy)- = Octylphenolethoxy-late	
255	27193-28-8	Phenol, (1,1,3,3-tetramethylbutyl)- = Octylphenol	
256	27985-70-2	Phenol, (1-methylheptyl)-	
257	3884-95-5	Phenol, 2-(1,1,3,3-tetramethylbutyl)-	
258	17404-44-3	Phenol, 2-(1-ethylhexyl)-	
259	18626-98-7	Phenol, 2-(1-methylheptyl)-	
260	37631-10-0	Phenol, 2-(1-propylpentyl)-	
261	949-13-3	Phenol, 2-octyl-	
262	3307-00-4	Phenol, 4-(1-ethylhexyl)-	
263	1818-08-2	Phenol, 4-(1-methylheptyl)-	
264	3307-01-5	Phenol, 4-(1-propylpentyl)-	
268	25013-16-5	tert.-Butylhydroxyanisole (BHA)	
270	84-75-3	Di-n-hexyl phthalate (DnHP) = Dihexylphthalate (DHP)	
272	131-16-8	Di-n-propylphthalate (DprP) = Dipropylphthalate	
273	4376-20-9	Mono 2 ethyl hexylphthalate (MEHP)	
274	131-70-4	Mono-n-butylphthalate	
275	33204-76-1	2,6-cis-Diphenylhexamethylcyclotetrasiloxane - 2,6-cis-[(PhMeSiO)2(Me2SiO)2][	
277	56-33-7	Diphenyltetramethyldisiloxane PhMe2-SiOSiMe2Ph	
278	10448-09-6	Phenylheptamethylcyclotetrasiloxane [(PhMe-SiO)(Me2SiO)3]	
279	28994-41-4	Phenyl-2-hydroxyphenylmethane = 2-Benzylphenol = o-Benzylphenol	
284	3373-03-3	1,1-Bis(4-hydroxyphenyl)-n-heptane	
285	24362-98-9	1,1-Bis(4-hydroxyphenyl)-n-hexane	
288	6807-17-6	2,2-Bis(4-hydroxyphenyl)-4-methyl-n-pentane	R60: May impair fertility
289	77-40-7	2,2-Bis(4-hydroxyphenyl)-n-butan = Bisphenol B	
290	14007-30-8	2,2-Bis(4-hydroxyphenyl)-n-hexane	

No.	CAS	Name	Existing labeling (ESIS)
292	52479-85-3	2,3,4,3',4',5'-Hexahydroxybenzophenon	
294	611-99-4	4,4'-Dihydroxybenzophenon	
297	81-92-5	2-[Bis(4-hydroxyphenyl)methyl]benzylalkohol = Phenolphthalol	
298	77-09-8	3,3'-Bis(4-hydroxyphenyl)phthalid = Phenol-phthaleine	
321	1125-78-6	5,6,7,8-Tetrahydro-2-naphthol = 6-Hydroxytetralin	
322	15231-91-1	6-Bromo-2-naphthol	
323	530-91-6	Tetrahydronaphthol-2	
335	303-38-8	2,3-dihydroxybenzoicacid (2,3-DHBA)	
337	490-79-9	2,5-dihydroxybenzoicacid (2,5-DHBA)	
342	537-98-4	Ferulic acid (FA)	
343	533-73-3	Hydroxyhydroquinone	
346	7400-08-0	p-Coumaric acid (PCA)	
348	463-56-9	Thiocyanate	
409	26401-75-2	Phenol, 2-sec-octyl-	
411	27214-47-7	Phenol, 4-sec-octyl-	
552	545-55-1	TEPA	
328	53-96-3	n-2-fluorenylacetamide	
178	50-18-0	Cyclophosphamide	
179	682-80-4	Demefion	
220	6164-98-3	Chlordimeform	
223	25550-58-7	Dinitrophenol	
375	70393-85-0	Glufosinate-ammonium	
222	96-12-8	Dibromochloropropane (DBCP)	R60: May impair fertility
377	121-29-9	Pyrethrin	
365	83-05-6	p,p'-DDA	
667	114369-43-6	Fenobucanazole	
170	14868-03-2	Bis-OH-MDDE	
New-8	33704-61-9	6,7-dihydro-1,1,2,3,3-pentamethyl-4(5H)indanone	
New-8	94-26-8	n-Butyl p-Hydroxybenzoate	
New-28	2581-34-2	3-methyl-4-nitrophenol	

Substances not found on ECB - ESIS list and therefore excluded from the evaluation

No.	CAS	Name
229	135505-63-4	4-Hydroxyphenyl-di-a-naphthylmethane
230	630-95-5	Diphenyl-a-naphthylcarbinol
339	57-12-5	Cyanide
513	20291-73-0	1,9-Dimethylphenanthrene
515	58024-06-9	2,8-Dihydroxy-4b,5,6,10b,11,12-hexahydrochrysene
522	5684-12-8	Dehydrodoisynolacid = Bisdehydrodoisynolacid
303	53905-30-9	2-Hydroxy-2',5'-dichlorobiphenyl
304	53905-29-6	3-Hydroxy-2',5'-dichlorobiphenyl
305	53905-28-5	4-Hydroxy-2',5'-dichlorobiphenyl
306	23719-22-4	4-Hydroxy-2-chlorobiphenyl
308	28034-99-3	4-Hydroxy-4'-chlorobiphenyl
310	2050-67-1	PCB 11 (3,3'-Dichlorobiphenyl)
316	13029-08-8	PCB 4 (2,2'-Dichlorobiphenyl)
317	34883-43-7	PCB 8 (2,4'-Dichlorobiphenyl)
318	11104-28-2	PCB Aroclor 1221
319	11141-16-5	PCB Aroclor 1232
479	34883-39-1	2,5-Dichlorobiphenyl
481	34883-41-5	3,5-Dichlorobiphenyl
484	56858-70-9	4,4'-Dihydroxy-2'-chlorobiphenyl
489	79881-33-7	4-Hydroxy-2',6'-dichlorobiphenyl
246	94-06-4	4-sec-Pentylphenol = 4-(1-Methylbutyl)phenol = p-sec-amylphenol
276	30026-85-8	Diphenylhexamethylcyclotetrasiloxane [(PhMeSiO)2(Me2SiO)2]
281	2081-08-5	1,1-Bis(4-hydroxyphenyl)ethane
282	2081-32-5	1,1-Bis(4-hydroxyphenyl)-iso-pentane
283	4731-84-4	1,1-Bis(4-hydroxyphenyl)-n-butane
286	1576-13-2	1,1-Bis(4-hydroxyphenyl)-n-propane
299	4081-02-1	Bis(4-Hydroxyphenyl)phenylmethane
340	482-49-5	Doisynolic acid
392	1805-61-4	4-iso-Pentylphenol = 4-(3-Methylbutyl)phenol
408	1331-54-0	Phenol, (2-ethylhexyl)-
433	31751-59-4	2,4-trans-Diphenyltetramethylcyclotrisiloxane - 2,4-trans-[(PhMeSiO)2(Me2SiO)]
434	33204-77-2	2,6-trans-Diphenylhexamethylcyclotetrasiloxane - 2,6-trans-[(PhMeSiO)2(Me2SiO)2]
435	51134-25-9	Diphenyltetramethylcyclotrisiloxane [(PhMeSiO)2(Me2SiO)]
436	35964-76-2	o-Tolylheptamethylcyclotetrasiloxane [(o-TolylMeSiO)(Me2SiO3)]
437	17156-72-8	Phenylhexamethylcyclotetrasiloxane [(PhHSiO)(Me2SiO)3]
438	17964-44-2	PhMe[SiCH2CH2SiMePhO]
439	92569-29-4	1,1-Bis(4-hydroxyphenyl)-2-ethyl-n-butane
441	1844-00-4	1,1-Bis(4-hydroxyphenyl)-iso-butane
442	7615-24-9	2,2,5,5-Tetra(4-hydroxyphenyl)-n-hexane
444	3555-19-9	2,2-Bis(4-hydroxyphenyl)-3-methyl-n-butane
445	41709-94-8	2,2-Bis(4-hydroxyphenyl)-n-heptane
446	6052-90-0	2,2-Bis(4-hydroxyphenyl)-n-octane
447	4204-58-4	2,2-Bis(4-hydroxyphenyl)-n-pentane
448	31127-54-5	2,3,4,4'-Tetrahydroxybenzophenon
449	10196-77-7	3,3-Bis(4-hydroxyphenyl)-n-hexane
450	3600-64-4	3,3-Bis(4-hydroxyphenyl)-n-pentane
451	7425-79-8	4,4-Bis(4-hydroxyphenyl)-n-heptane
453	21388-77-2	4-Hydroxyphenyl-4'-methoxyphenylmethane
454	57547-76-9	5,5-Bis(4-hydroxyphenyl)-n-nonane
455	59176-75-9	6,6-Bis(4-hydroxyphenyl)-n-undekane

No.	CAS	Name
456	10193-50-7	Bis(3-hydroxyphenyl)methane
466	115489-12-8	1,1-Bis(4-hydroxyphenyl)-1-(4-methoxyphenyl)ethane
467	1571-75-1	1,1-Bis(4-hydroxyphenyl)-1-phenylethane
470	791-92-4	4-Hydroxy-triphenylmethane
471	115481-73-7	Bis(4-hydroxyphenyl)[(2-phenoxysulfonyl)phenyl]methane
473	4865-83-2	1,3-Bis(4-hydroxyphenyl)pentane
474	2549-50-0	1,3-Bis(4-hydroxyphenyl)propane
475	85-95-0	2,4-Bis(4-hydroxyphenyl)-3-ethylhexane
477	140131-31-3	3,5-Bis(4-hydroxyphenyl)heptane
510	553-39-9	2-Hydroxy-6-naphthylpropionacid
546	NoCAS052	Allenolic acid
514	573-22-8	1-Oxo-1,2,3,4-tetrahydrophenanthrene
144	76578-14-8	Quizalofop-ethyl
341	64529-56-2	Ethiozin
167	3567-62-2	1-(3,4-Dichlorophenyl)-3-methylurea
349	463-77-4	Carbamate
369	17356-61-5	1-(3,4-Dichlorophenyl)-3-methoxyurea
146	34113-46-7	o,p'-DDA
352	65148-76-7	3-MeO-o,p'-DDA
357	65148-77-8	5-MeO-o,p'-DDA
172	2132-70-9	MDDE
372	75938-34-0	Mono-OH-MDDE
373	28463-03-8	Mono-OH-Methoxychlor
New-7	125116-23-6	Metconazole
New-12	1303-96-4	Borax

Substances with no CAS number + (? substances) and therefore excluded from the evaluation

No.	CAS	Name
516	NoCAS089	2,8-dihydroxy-5,6,11,12,13,14-hexahydrochrysene
491	NoCAS126	4-hydroxy-3,5-dichlorobiphenyl
394	NoCAS016	4-Nonylphenoxycarboxylic acid (NP1EC)
395	NoCAS013	4-tert-Pentylphenol = p-tert-Amylphenol
399	NoCAS015	Nonylphenolcarboxylic acid
400	NoCAS017	Nonylphenolethoxylate carboxylic acid
404	NoCAS106	nonylphenolethyleneoxyphosphate
405	NoCAS014	Octylphenol-5-ethoxylate
440	NoCAS025	1,1-Bis(4-hydroxyphenyl)-2-n-propylpentane
452	NoCAS026	4,4-Bis(4-hydroxyphenyl)-n-octane
476	NoCAS030	2,4-Bis(4-hydroxyphenyl)-3-ethylpentane
374	NoCAS108	1-methyl-2-methylcarbamoylvinyldimethyl phosphate
383	NoCAS009	Indole(3.2-b)carbazole (ICZ)
376	NoCAS122	Metalodemeton
382	NoCAS130	Febuconazole
New-8	NoCAS	Benzophenone derivatives

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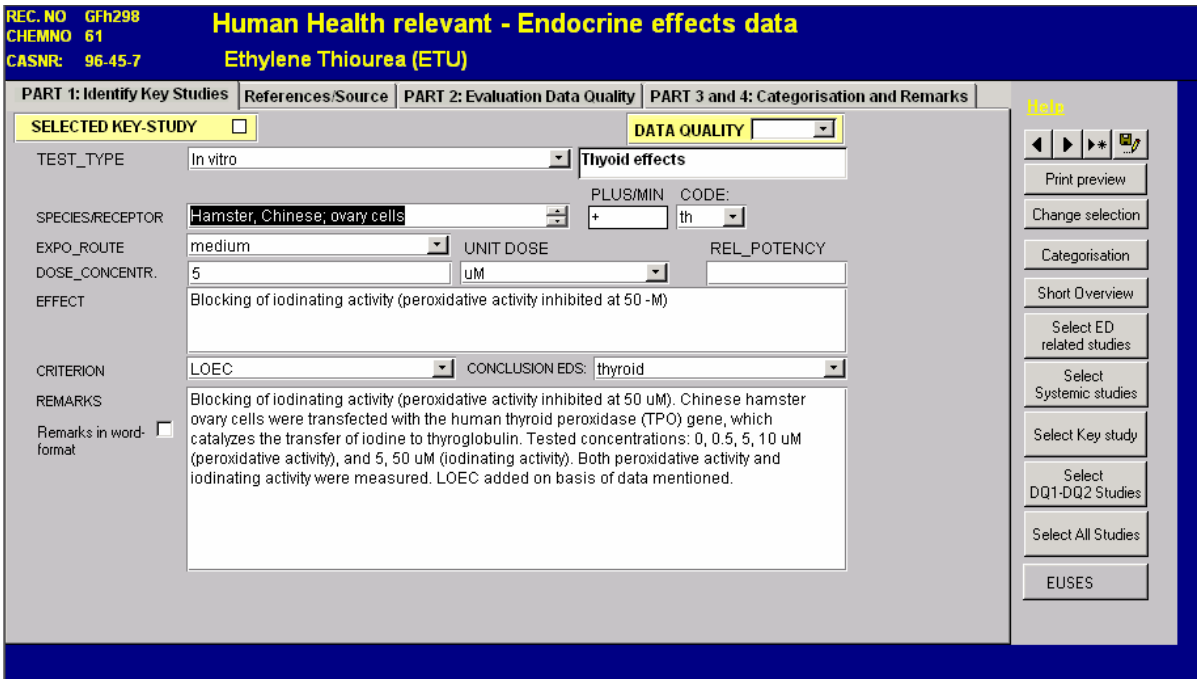
yos99	Yoshizaki, Hiroshi [Reprint author]; Izumi, Yuko; Hirayama, Chizuka; Fujimoto, Akihiro; Kandori, Hitoshi; Sugitani, Toshiyasu; Ooshima, Yojiro (1999). Availability of sperm examination for male reproductive toxicities in rats treated with boric acid. Jou
Zha(05)	Zhang Yun-Hui; Liu Zhi-Wei; Chen Bing-Heng [Reprint Author] (2005). Toxicity of phthalates on Sertoli cells of rat testis. Zhongguo Yaolixue Yu Dulixue Zazhi, (AUG 2005) Vol. 19, No. 4, pp. 300-304.
zha05	Zhang, Bo; Xu, Guang-cui; Liu, Feng; Zhao, Tong (2005). Effect of omethoate on the activity of characteristic enzymes in the mouse testicles and the antagonism by tea polyphenol. Huanjing Yu Jiankang Zazhi, (2005) Vol. 22, No. 5, pp. 340-342.
Zhe(97)	Zheng R L; Zhang H (1997). Effects of ferulic acid on fertile and asthenozoospermic infertile human sperm motility, viability, lipid peroxidation, and cyclic nucleotides. Free radical biology medicine, (1997) Vol. 22, No. 4, pp. 581-6.

A P P E N D I X K

Manual for the VEIW version of the EDC Database

Manual for the VIEW version of the EDS Database



Updated 2006 by DHI Water & Environment

CONTENTS

ABBREVIATIONS

EM 1999 and EM 2002	EDS Expert meeting 1999 and 2002
BKH 2000	BKH 2000 report
RPS BKH 2002	BKH 2003 report
DHI 2000	Underlying report
DQ	Data Quality 1 – 2 – 3 – 4:
DQ1	• Good data quality, fulfilling all (important) criteria
DQ2	• Sufficient data quality, study fulfilling most of the (important) criteria
DQ3	• Insufficient data quality, study cannot be used for identification
DQ4	• Not evaluated
CAT1, 2, 3a or 3b	Category 1, 2, 3 or 4
CAT1	At least one study providing evidence of endocrine disruption in an intact organism. Not a formal weight of evidence approach.
CAT2	Potential for endocrine disruption. In vitro data indicating potential for endocrine disruption in intact organisms. Also includes effects *in-vivo* that may, or may not, be ED-mediated. May include structural analyses and metabolic considerations.
CAT3a	No scientific basis for inclusion in list (ED studies available but no indications on ED effects)
CAT3b	Substances with no or insufficient data gathered

1 INTRODUCTION

The EDS database is the result of three studies on the identification of Endocrine Disrupters for further research, conducted by RPS BKH Consulting Engineers in 1999-2000 and 2002 and by DHI in 2006. All three studies have been contracted by the European Commission DG Environment E1.

The EDS database holds information for more than 500 chemicals on Human health and Wildlife relevant data concerning both Endocrine disrupting effects and Systemic toxicity. Furthermore, the results of categorisations prepared by experts at two separate EU Expert meetings on endocrine disrupters held on 27-28 September 1999 and 9-10 September 2002 are included. The EDS database gives the opportunity to select (groups of) chemicals, view and print all available effects data, identified key-studies, categorisations and qualifying remarks given by experts. More information on the data in the EDS database, the evaluation and categorisation procedure can be found in the RPS BKH report 2002 and the DHI report 2006.

If you have any questions or comments to these instructions or the EDS database, please do not hesitate to contact us via (gip@dhigroup.com)

1.1 Installing the EDS database

Two separate EDS database versions are developed for Access 2000 and Access 2003.

Depending on the operating system and Office package installed on your computer, the appropriate version of the EDS database plus the help.doc file must be copied to a separate directory (e.g. C:\EDSdatabase\…).

After having copied the Access file to your computer, make sure to remove the read-only option under properties (in file manager).

2 WORKING WITH THE EDS DATABASE

The database can be opened in Access using Office version 2000 or 2003. In this manual, not all options in the different Windows are explained. However, most of these options are self-explanatory.

2.1 Start Menu

After opening the EDS database, the 'Start Menu' is activated. This menu consists of a number of options including a 'View module'. Other options are 'Categorisation' which gives the results of the categorisation plus qualifying remarks; 'References' and 'Literature sources'.

In principle, the view module consists of 5 windows:

1. Selection of chemicals and type of data (Human Health or Wildlife relevant)

2. Short overview of the data
3. Pre-print Short overview
4. Details of the data
5. Pre-print of the details
6. Results of EUSES calculations (CAT1 and CAT2)
7. Datasheets for CAT1 substances

2.2 Selection of chemicals and type of data

The first window in the View Module can be used to select chemical(s) of interest. This window includes the 'Identified chemicals' form and the 'Selected chemicals' form.

To start the search, chemicals can be selected using the chemical name field, the CAS number field or chemical group field. Using the 'chemical names' field, chemicals can be selected using parts of their names and adding wild cards (*).

Chemicals are identified when the  button next to the selection field is applied. Hereafter in the 'Identified chemicals' form, all chemicals will appear that have been attributed to the selection made. Using the  options, one or more chemicals can be (de)selected.

After selecting the option 'Human Health' or 'Wildlife' relevant data, the next window can be opened, choosing the window 'short overview' or immediate to 'details' or details on key studies.

It should be emphasised that the EDS database does NOT contain effects data on all chemicals. In some cases, categorisation is based on data available for 'reference' chemicals only.

2.3 Short overview window

This window gives a short overview of the studies available on the selected chemical(s). Fields included in this overview are explained in Annex 1.

This window has a number of options to select specific types of data such as *in-vivo* or *in-vitro* ED-related data, systemic toxicity data and key studies (if available).

Other available options to choose from are: 'Pre-print Short overview', Details of selected studies, the overview of the categorisation or change the selection of chemicals

2.4 Pre-print Short overview

This window gives the opportunity to print out a short overview of all data on the selected chemicals. To print or close the window, a temporary BAR appears.

2.5 Details window

This window is subdivided into 4 tab-sheets and gives extended information on the selected studies and the four parts of the expert evaluation.

Tab-sheet one shows Part 1 of the expert evaluation: Identification of key studies with details of a study and the Tag-field Key study. In a separate Tab-sheet, also the reference and source of information are included plus information on whether the primary reference will be available at the expert meeting. The fields included in this tab-sheet are explained in Annex 1.

Part 2: Evaluation of the Data quality of the key studies includes free fields for the experts to fill in their reasoning on the quality of the specific study.

Parts 3 and 4: Categorisation of the chemicals plus qualifying remarks and Additional considerations include free fields with the experts reasoning on the categorisation of a chemical.

The Details window has a number of options to select specific types of data such as ED-related studies, systemic toxicity studies, DQ1 and DQ2 studies etc.

Furthermore, options are available to go to 'Print preview', 'Short overview' of the selected studies, go to 'Categorisation' or to change the selection of chemicals.

2.6 Print preview of the details

This Window gives an overview of all details of selected studies including data quality, categorisation and remarks.

2.7 Categorisation Window

The 'Categorisation' form shows all categorisations based on Human Health and Wildlife relevant data and overall categorisation, of chemicals incorporated in the EDS database including the event when the categorisation was applied.

The form gives the possibility to select chemicals categorised at specific events such as Expert meeting 1999 or 2002 (**EM 1999** or **EM 2002**), categorisation given in the BKH 2000 report or RPS BKH 2002 report, and DHI 2006 report. Additionally, specific Categories can be selected (CAT1, CAT2, CAT3 (BKH 2000 report) CAT3a and CAT3b (explanation see Annex 1). All these lists or the complete list can be printed.

Hereafter, additional information on the selected chemicals can be viewed selecting 'Qualifying remarks', 'Short overview' or 'Details'.

2.8 EUSES calculations

For the CAT1 and CAT2 substances assessed in the 2006 project, it is possible to see/print the results of the EUSES calculations including the physical-chemical properties used for the calculations.

2.9 Datasheets

For the CAT1 substances assessed in the 2006 project, it is possible to see/print a datasheet summarizing the properties of the substance, the EUSES calculations, and the conclusion on the assessment.

ANNEX 1: EXPLANATION OF THE FIELDS IN THE EDS DATABASE

Field	Explanation:
Recno	Record code in the database for example: GPh001 (Gitte Peterson– author; H – human relevant ED data; 001 – first record); LBw021 (Lamert van Breemen– author; W – wildlife relevant ED data 021 – 21 record); GPsh059 (Gitte Peterson– author; SH – systemic toxicity); CGse311 (Christa Groshart– author; SE – systemic Ecotoxicity). The code is unique.
Chemno	Chemical number: each chemical has a number, which can be found in the Totlist. So there is no need to type the chemical name
Test type	Human health relevant data included are ***epidemiological***, ***in-vitro*** and ***in-vivo*** experiments. *In-vivo* studies are sometimes subdivided into ACUTE, REP (Reproduction) or RDT (Repeated Dose Toxicity). Wildlife relevant data are ***field, in-vitro*** and ***in-vivo*** experiments.
Test method	OECD ... or other procedures used for the test
Species/receptor	Information such as: species, strain, age, weight, gender, cell type. e.g. rat, Salmon or Human MCF-7 cells
Exposure route	Food, water, oral, intraperitoneal, subcutaneous ...
Dose-conc.	Numerical value of the amount of substance applied
Unit	Unit of the dose or concentration applied
Relative Potency	Endocrine effects related to a reference substance as for example estradiol: *In the remarks field, it should be made clear how this ratio is calculated*
Effect	Effect parameter tested, e.g. feminized females, testicular or ovarian effects hormone effects, thyroid effect (a listing of effect parameters is given in Annex 1)
Criterion	NOEL (No observed effect level), LOEL (lowest observed effect level), ED (effect dose), LC50 (lethal concentration 50%), NOEC (No observed effect concentration), TDlow (lowest toxic dose) *The exposure concentration/dose preferably referred to the LOEL if available. If more criteria were reported, these were put in the remarks field*
Code	The data have been given a code (class) to combine the different groups of effects. The following groups of effects are distinguished: e: Suspected endocrine effects on (anti) estrogenic (anti) androgenic pi: Effect on pituitary organ re: Retinoid effects th: Effects on thyroid organ y: Reproductive/teratogenic effects z: Other systemic toxicity effects The code was combined with a '-' or '+' sign (e.g. +e). The '**-**' sign attached to the experiment-code stands for no effects at all concentrations tested, whereas the '**+**' sign refers to the observation that effects were found in the experiment.
RefID	Reference code of the experiment (a first three letters of first author, year, and if there are more publications of the same author in one year use a letter a, b, c, d etc.)
SourceID	Source code of the experiment, like the Ref ID.

Field	Explanation:
Remarks	Detailed information on experimental design and test results. If on ED there is a NOEC and LOEC or NOEL and LOEL is available, then put the NOEC/NOEL in the remarks field and LOEC/LOEL in the criteria field. Other information in the remarks field is: • Exposure period (e.g. 21 days, 2 generations ...)/ frequency • Number of test concentrations plus levels • Test system (static/renewal/flow through) • Details on types of effects • Concentrations measured/analyse • Life stage • Details on critical window
Data Quality	DQ1: good data quality, fulfilling all (important) criteria; DQ2: sufficient data quality, study fulfilling most of the (important) criteria; DQ3: insufficient data quality, study cannot be used for identification; DQ4: not evaluated
Evaluation Data Quality	**Relevance effect parameter:** • Relation ED effects with mechanistic cause **Test reliability:** • Use of validated protocols (analysis, test procedure) • Experimental design: controls, concentration range • Test species: suitability, health, life stage... • Analysis of results: statistics • Dose – Response relationship **ED potency:** • Comparison with indicator hormone activity (e.g. estradiol), if available
CATEGORY	CAT1 At least one study providing evidence of endocrine disruption in an intact organism. Not a formal weight of evidence approach. CAT2 Potential for endocrine disruption. In vitro data indicating potential for endocrine disruption in intact organisms. Also includes effects in-vivo that may, or may not, be ED-mediated. May include structural analyses and metabolic considerations CAT3a No scientific basis for inclusion in list, based on data in the ED database (ED studies available but no indications on ED effects) CAT3b Substances with no or insufficient data gathered. CAT3 No scientific basis for inclusion in list or Substances with no or insufficient data gathered (BKH 2000 report)
Qualifying remarks	Coherence of results ED related tests; • 'other ED evidence is supporting' • 'other evidence is lacking' • 'other evidence is contradicting' Qualifying remarks may also concern the identification certain "groups" of substances with an overall ED categorisation on the basis of reference substances;
Additional considerations	• The amount of ED evidence • ED Potency • Comparison with systemic toxicity

A P P E N D I X L

Updated ranked priority list

CAS No.	NAME	Human health	Wildlife	Overall categorization
NoCAS 040	4-Hydroxy-3,3',4',5'-tetrachlorobiphenyl	CAT1	CAT2	CAT1
53905-33-2	4-Hydroxy-2,2',5'-trichlorobiphenyl	CAT1	CAT2	CAT1
4400-06-0	4-Hydroxy-3,4',5-trichlorobiphenyl	CAT1	CAT2	CAT1
67651-37-0	3-Hydroxy-2',3',4',5'-tetrachlorobiphenyl	CAT1	CAT2	CAT1
100702-98-5	4,4'-Dihydroxy-2,3,5,6-tetrachlorobiphenyl	CAT1	CAT2	CAT1
13049-13-3	4,4'-Dihydroxy-3,3',5,5'-tetrachlorobiphenyl	CAT1	CAT2	CAT1
4329-12-8	m,p'-DDD	CAT1	CAT3b	CAT1
72-54-8	p,p'-DDD	CAT1	CAT3b	CAT1
8068-44-8	Clophen A50	CAT1	CAT2	CAT1
65148-75-6	5-MeO-o,p'-DDD	CAT1	CAT3b	CAT1
NoCAS 036	PCB Aroclor 1016	CAT1	CAT1	CAT1
54991-93-4	Clophen A30	CAT1	CAT2	CAT1
53-19-0	o,p'-DDD	CAT1	CAT2	CAT1
NoCAS 037	PCB 126 (3,3',4,4',5-Pentachlorobiphenyl)	CAT1	CAT1	CAT1
118174-38-2	6-Methyl-1,3,8-trichlorodibenzofuran	CAT1	CAT2	CAT1
56614-97-2	3,9-Dihydroxybenz(a)anthracene	CAT1	CAT2	CAT1
65148-72-3	4-MeO-o,p'-DDT	CAT1	CAT3b	CAT1
65148-73-4	5-OH-o,p'-DDT	CAT1	CAT3b	CAT1
65148-74-5	5-MeO-o,p'-DDT	CAT1	CAT3b	CAT1
57-97-6	7,12-Dimethyl-1,2-benz(a)anthracene	CAT1	CAT2	CAT1
56-49-5	3-Methylcholanthrene	CAT1	CAT3b	CAT1
NoCAS 038	Mixture of 2,3,4,5-tetrachlorobiphenyl (PCB 61), 2,2',4,5,5'-octachlorobiphenyl (PCB 101) and 2,2',3,3',4,4',5,5'-octachlorobiphenyl (PCB 194)	CAT1	CAT1	CAT1
7099-43-6	5,6-Cyclopento-1,2-benzanthracene	CAT1	CAT2	CAT1
NoCAS 039	PCB 104 (2,2',4,6,6'-Pentachlorobiphenyl)	CAT1	CAT1	CAT1
35693-99-3	PCB 52 (2,2';5,5'-Tetrachlorobiphenyl)	CAT1	CAT1	CAT1
NoCAS 042	PCB 122 (2,3,3',4,5 -Pentachlorobiphenyl)	CAT1	CAT1	CAT1
2971-36-0	Bis-OH-Methoxychlor = 1,1,1-trichloro-2,2-bis(4-hydroxyphenyl)ethane (HTPE)	CAT1	CAT1	CAT1
38380-07-3	PCB 128 (2,2',3,3',4,4'-Hexachlorobiphenyl)	CAT1	CAT1	CAT1
NoCAS 041	PCB 105 (2,3,3',4,4' -Pentachlorobiphenyl)	CAT1	CAT1	CAT1
67651-34-7	4-Hydroxy-2',3',4',5'-tetrachlorobiphenyl	CAT1	CAT2	CAT1
50-32-8	Benzo[a]pyrene	CAT1	CAT2	CAT1
9006-42-2	Metiram (Metiram-complex)	CAT1	CAT3b	CAT1
55702-46-0	PCB 21 (2,3,4-Trichlorobiphenyl)	CAT1	CAT1	CAT1
32809-16-8	Procymidon	CAT1	CAT3b	CAT1
87-86-5	Pentachlorophenol (PCP)	CAT1	CAT3b	CAT1
608-73-1	Hexachlorocyclohexane = HCH mixed	CAT3b	CAT3b	CAT1

CAS No.	NAME	Human health	Wildlife	Overall categorization
319-85-7	Beta-HCH	CAT2	CAT1	CAT1
9016-45-9	Nonylphenolethoxylate	CAT2	CAT1	CAT1
72-43-5	Methoxychlor	CAT1	CAT1	CAT1
85535-84-8	Short chain chlorinated paraffins	CAT1	CAT3b	CAT1
72-43-5	p,p'-Methoxychlor	CAT1	CAT1	CAT1
8018-01-7	Mancozeb	CAT1	CAT3b	CAT1
60168-88-9	Fenarimol	CAT1	CAT2	CAT1
10453-86-8	Resmethrin	CAT1	CAT3b	CAT1
52918-63-5	Deltamethrin	CAT1	CAT2	CAT1
30668-06-5	1,3-Dichloro-2,2-bis(4-methoxy-3-methylphenyl)propane	CAT1	CAT1	CAT1
21087-64-9	Metribuzin	CAT1	CAT3b	CAT1
72-55-9	p,p'-DDE	CAT1	CAT1	CAT1
12642-23-8	PCT Aroclor 5442	CAT1	CAT1	CAT1
65148-80-3	3-MeO-o,p'-DDE	CAT1	CAT3b	CAT1
11081-15-5	Phenol, isooctyl-	CAT1	CAT1	CAT1
14962-28-8	4-Hydroxy-2',4',6'-trichlorobiphenyl	CAT1	CAT2	CAT1
37680-65-2	PCB 18 (2,2',5-Trichlorobiphenyl)	CAT1	CAT1	CAT1
2971-22-4	1,1,1-Trichloro-2,2-bis(4-chlorophenyl)ethane	CAT1	CAT1	CAT1
65148-82-5	5-MeO-o,p'-DDE	CAT1	CAT3b	CAT1
3424-82-6	o,p'-DDE	CAT1	CAT2	CAT1
101-53-1	Phenyl-4-hydroxyphenylmethane = 4-Benzylphenol = p-Benzylphenol	CAT1	CAT3b	CAT1
84-66-2	Diethyl phthalate (DEP)	CAT1	CAT3b	CAT1
84-61-7	Dicyclohexyl phthalate (DCHP)	CAT1	CAT2	CAT1
65148-83-6	o,p'-DDA-glycinat = N-[(2-chlorophenyl)(4-chlorophenyl)acettyl]glycin	CAT1	CAT3b	CAT1
14835-94-0	o,p'-DDMU	CAT1	CAT3b	CAT1
85535-85-9	Intermediate chain chlorinated paraffins	CAT1	CAT3b	CAT1
65148-81-4	4-MeO-o,p'-DDE	CAT1	CAT3b	CAT1
65277-42-1	Ketoconazol	CAT1	CAT3b	CAT1
5103-73-1	Cis-Nonachlor	CAT2	CAT1	CAT1
608-93-5	Pentachlorobenzene	CAT1	CAT3b	CAT1
1918-02-1	Picloram	CAT1	CAT3b	CAT1
63-25-2	Carbaryl	CAT1	CAT2	CAT1
43216-70-2	3-OH-o,p'-DDT	CAT1	CAT3b	CAT1
50585-41-6	2,3,7,8-TeBDD	CAT1	CAT2	CAT1
886-50-0	Terbutryn	CAT1	CAT3b	CAT1
39765-80-5	Trans-Nonachlor	CAT2	CAT1	CAT1
7012-37-5	PCB 28 (2,4,4'-trichlorobiphenyl)	CAT1	CAT1	CAT1
31508-00-6	PCB 118 (2,3',4,4',5-pentachlorobiphenyl)	CAT1	CAT1	CAT1
1806-26-4	Phenol, 4-octyl-	CAT1	CAT1	CAT1
12002-48-1	Trichlorobenzene	CAT1	CAT3b	CAT1
91465-08-6	Cyhalothrin (@Karate)	CAT1	CAT3b	CAT1
82657-04-3	Bifenthrin (@Talstar)	CAT1	CAT3b	CAT1
1689-83-4	Ioxynil	CAT1	CAT3b	CAT1
NoCAS 088	PCB180 2,2',3,4,4',5,5'-heptachlorobiphenyl	CAT1	CAT1	CAT1

CAS No.	NAME	Human health	Wildlife	Overall categorization
789-02-6	o,p'-DDT	CAT1	CAT1	CAT1
NoCAS 127	2,4-6-trichlorobiphenyl	CAT1	CAT2	CAT1
94-82-6	2,4-dichlorophenoxybutyric acid = 2,4-DB	CAT1	CAT3b	CAT1
NoCAS 128	3,4',5-trichlorobiphenyl	CAT1	CAT2	CAT1
72-33-3	Mestranol	CAT1	CAT2	CAT1
106-89-8	Epichlorohydrin (1-chloro-2,3-epoxypropane)	CAT1	CAT3b	CAT1
NoCAS 087	PCB138 2,2',3,4,4',5'-hexachlorobiphenyl	CAT1	CAT1	CAT1
25036-25-3	2,2'-bis(2-(2,3-epoxypropoxy)phenyl)-propane	CAT3b	CAT1	CAT1
106-93-4	Dibromoethane (EDB)	CAT1	CAT3b	CAT1
NoCAS 092	PCB 114 (2,3,4,4',5-pentachlorobiphenyl)	CAT1	CAT1	CAT1
NoCAS 096	1,1-trichloro-2,2-bis(4-hydroxyphenyl)ethane (HPTE)	CAT1	CAT1	CAT1
NoCAS 097	4-OH-2,2',4',5,5'-pentachlorobiphenyl	CAT1	CAT2	CAT1
122-14-5	Fenitrothion	CAT1	CAT2	CAT1
1022-22-6	p,p'-DDMU	CAT1	CAT3b	CAT1
104-40-5	4-Nonylphenol (4-NP)	CAT1	CAT1	CAT1
25013-16-5	tert.-Butylhydroxyanisole (BHA)	CAT1	CAT1	CAT1
1131-60-8	4-Cyclohexylphenol	CAT1	CAT3b	CAT1
99-96-7	p-Hydroxybenzoic acid	CAT1	CAT3b	CAT1
131-55-5	Benzophenone-2 (Bp-2), 2,2',4,4'-tetrahydroxybenzophenone	CAT1	CAT1	CAT1
13593-03-8	Quinalphos = Chinalphos	CAT1	CAT1	CAT1
15087-24-8	3-Benzylidene camphor (3-BC)	CAT1	CAT1	CAT1
94-26-8	n-Butyl p-Hydroxybenzoate	CAT1	CAT1	CAT1
94-13-3	n-propyl p-hydroxybenzoate	CAT1	CAT1	CAT1
556-67-2	Cyclotetrasiloxane	CAT1	CAT3b	CAT1
99-76-3	Methyl p-Hydroxybenzoate	CAT1	CAT3b	CAT1
1582-09-8	Trifluralin	CAT1	CAT2	CAT1
36861-47-9	3-(4-Methylbenzylidene)camphor	CAT1	CAT3a	CAT1
96-45-7	Ethylene Thiourea (ETU)	CAT1	CAT1	CAT1
92-69-3	4-Hydroxybiphenyl = 4-Phenylphenol	CAT1	CAT3b	CAT1
5466-77-3	2-ethyl-hexyl-4-methoxycinnamate	CAT1	CAT1	CAT1
131-18-0	Di-n-pentylphthalate (DPP) = Dipentylphthalate	CAT1	CAT3b	CAT1
96-12-8	Dibromochloropropane (DBCP)	CAT1	CAT3b	CAT1
120-47-8	ethyl 4-hydroxybenzoate	CAT1	CAT1	CAT1
10043-35-3	Boric acid	CAT1	CAT2	CAT1
7400-08-0	p-Coumaric acid (PCA)	CAT1	CAT3b	CAT1
1634-04-4	methyl tertiary butyl ether (MTBE)	CAT1	CAT2	CAT1
27193-28-8	Phenol, (1,1,3,3-tetramethylbutyl)- = Octylphenol	CAT1	CAT1	CAT1
6164-98-3	Chlordimeform	CAT1	CAT3b	CAT1
77-09-8	3,3'-Bis(4-hydroxyphenyl)phthalid = Phenolphthaleine	CAT1	CAT3b	CAT1
131-70-4	Mono-n-butylphthalate	CAT1	CAT3b	CAT1
4376-20-9	Mono 2 ethyl hexylphthalate (MEHP)	CAT1	CAT3b	CAT1

CAS No.	NAME	Human health	Wildlife	Overall categorization
92-88-6	4,4'-Dihydroxybiphenyl = 4,4'-Biphenol	CAT1	CAT2	CAT1
1113-02-6	Omethoate	CAT1	CAT3b	CAT1
33204-76-1	2,6-cis-Diphenylhexamethylcyclotetrasiloxane - 2,6-cis-[(PhMeSiO)2(Me2SiO)2][	CAT1	CAT3b	CAT1
77-40-7	2,2-Bis(4-hydroxyphenyl)-n-butan = Bisphenol B	CAT1	CAT3b	CAT1
611-99-4	4,4'-Dihydroxybenzophenon	CAT1	CAT1	CAT1
131-56-6	2,4-Dihydroxybenzophenon = Resbenzophenone	CAT1	CAT1	CAT1
50-18-0	Cyclophosphamide	CAT1	CAT3b	CAT1
26354-18-7	2-propenoic acid, 2-methyl-, methyl ester = Stannane, tributylmeacrylate	CAT2	CAT1	CAT1
50-29-3	DDT (technical) = clofenotane	CAT1	CAT1	CAT1
2385-85-5	Mirex	CAT1	CAT2	CAT1
8001-35-2	Toxaphene = Camphechlor	CAT1	CAT2	CAT1
143-50-0	Kepone (Chlordecone)	CAT1	CAT2	CAT1
12789-03-6	Chlordane	CAT1	CAT2	CAT1
57-74-9	Chlordane (cis- and trans-)	CAT1	CAT2	CAT1
26636-32-8	Tributyltinnaphthalate	CAT2	CAT1	CAT1
50-29-3	p,p'-DDT = clofenotane	CAT1	CAT1	CAT1
3563-45-9	1,1,1,2-Tetrachloro-2,2-bis(4-chlorophenyl)ethane (tetrachloro DDT)	CAT2	CAT1	CAT1
58-89-9	Gamma-HCH (Lindane)	CAT1	CAT2	CAT1
1983-10-4	Stannane, tributylfluoro-	CAT2	CAT1	CAT1
95-76-1	3,4-Dichloroaniline	CAT2	CAT1	CAT1
26239-64-5	Stannane, tributyl[[[1,2,3,4,4a,4b,5,6,1	CAT2	CAT1	CAT1
25154-52-3	Phenol, nonyl-	CAT1	CAT1	CAT1
24124-25-2	Stannane, tributyl[(1-oxo-9,12-octadecad	CAT2	CAT1	CAT1
2155-70-6	Tributyl[(2-methyl-1-oxo-2-propenyl)oxy]stannane	CAT2	CAT1	CAT1
330-55-2	Linuron (Lorox)	CAT1	CAT3	CAT1
36631-23-9	Stannane, tributyl = Tributyltin naphtalate	CAT2	CAT1	CAT1
2437-79-8	PCB 47 (2,2',4,4'-Tetrachlorobiphenyl)	CAT1		CAT1
57117-31-4	2,3,4,7,8-Pentachlorodibenzofuran (2,3,4,7,8-PeCDF)	CAT1		CAT1
688-73-3	Tributyltin hydride	CAT2	CAT1	CAT1
56-35-9	Tributyltin oxide = bis(tributyltin) oxide	CAT2	CAT1	CAT1
NoCAS 050	Tributyltin compounds	CAT2	CAT1	CAT1
NoCAS 051	Triphenyltin	CAT3	CAT1	CAT1
99-99-0	4-Nitrotoluene	CAT1	CAT3	CAT1
3090-35-5	Stannane, tributyl[(1-oxo-9-octadecenyl)	CAT2	CAT1	CAT1
NoCAS 099	Tributyltincarboxylate	CAT2	CAT1	CAT1
1746-01-6	2,3,7,8-Tetrachlorodibenzo-p-dioxin (2,3,7,8-TCDD)	CAT1		CAT1
NoCAS 101	Tributyltinpolyethoxylate	CAT2	CAT1	CAT1

CAS No.	NAME	Human health	Wildlife	Overall categorization
NoCAS 004	PBBs = Brominated Flame retardants = PBB (mixed group of 209 Congeners)	CAT1		CAT1
4342-30-7	Phenol, 2-[[(tributylstannyl)oxy]carbony	CAT2	CAT1	CAT1
4342-36-3	Stannane, (benzoyloxy)tributyl-	CAT2	CAT1	CAT1
4782-29-0	Stannane, [1,2-phenylenebis(carbonyloxy)	CAT2	CAT1	CAT1
85409-17-2	Stannane, tributyl-, mono(naphthenoyloxy	CAT2	CAT1	CAT1
2279-76-7	Tri-n-propyltin (TPrT)	CAT3	CAT1	CAT1
1461-25-2	Tetrabutyltin (TTBT)	CAT2	CAT1	CAT1
900-95-8	Fentin acetate = triphenyltin acetate	CAT3	CAT1	CAT1
137-42-8	Metam Natrium	CAT1	CAT3	CAT1
34256-82-1	Acetochlor	CAT1	CAT3	CAT1
108-46-3	Resorcinol	CAT1	CAT3	CAT1
NoCAS 100	Methoxyetylacrylate tinbutyltin, copolymer	CAT2	CAT1	CAT1
84-74-2	Di-n-butylphthalate (DBP)	CAT1	CAT3	CAT1
137-26-8	Thiram	CAT1	CAT3	CAT1
12122-67-7	Zineb	CAT1	CAT3	CAT1
1912-24-9	Atrazine	CAT1	CAT2	CAT1
61-82-5	Amitrol = Aminotriazol	CAT1	CAT3	CAT1
50471-44-8	Vinclozolin	CAT1	CAT3	CAT1
15972-60-8	Alachlor	CAT1	CAT2	CAT1
1836-75-5	Nitrofen	CAT1	CAT3	CAT1
100-42-5	Styrene	CAT1	CAT3	CAT1
118-74-1	Hexachlorobenzene (HCB)	CAT1	CAT3	CAT1
40321-76-4	1,2,3,7,8-Pentachlorodibenzodioxin	CAT1		CAT1
85-68-7	Butylbenzylphthalate (BBP)	CAT1	CAT3	CAT1
12427-38-2	Maneb	CAT1	CAT3	CAT1
117-81-7	Di-(2-ethylhexyl)phthalate (DEHP)	CAT1	CAT3	CAT1
80-05-7	2,2-Bis(4-hydroxyphenyl)propan = 4,4'-isopropylidenediphenol = Bisphenol A	CAT1	CAT1	CAT1
53469-21-9	PCB Aroclor 1242	CAT1		CAT1
12672-29-6	PCB Aroclor 1248	CAT1		CAT1
32598-13-3	PCB 77 (3,3',4,4'-Tetrachlorobiphenyl)	CAT1		CAT1
35065-27-1	PCB 153 (2,2',4,4',5,5'-Hexachlorobiphenyl)	CAT1		CAT1
1336-36-3	PCB	CAT1		CAT1
11097-69-1	PCB Aroclor 1254	CAT1		CAT1
11096-82-5	PCB Aroclor 1260 (Clophen A60)	CAT1		CAT1
32774-16-6	PCB 169 (3,3',4,4',5,5'-Hexachlorobiphenyl)	CAT1		CAT1
140-66-9	4-tert-Octylphenol=1,1,3,3-Tetramethyl-4-butylphenol	CAT1	CAT1	CAT1

CAS No.	NAME	Human health	Wildlife	Overall categorization
125652-14-4	6-n-Propyl-1,3,8-trichlorodibenzofuran	CAT3b	CAT2	CAT2
131167-13-0	2-Bromo-1,3,7,8-tetrachlorodibenzodioxin	CAT3b	CAT2	CAT2
103124-72-7	8-Bromo-2,3,4-trichlorodibenzofuran	CAT3b	CAT2	CAT2
112344-57-7	8-Methyl-2,3,7-trichlorodibenzodioxin	CAT3b	CAT2	CAT2
172485-97-1	6-Methyl-2,3,8-trichlorodibenzofuran	CAT3b	CAT2	CAT2
172485-98-2	8-Methyl-1,3,7-trichlorodibenzofuran	CAT3b	CAT2	CAT2
172485-96-0	8-Methyl-1,3,6-trichlorodibenzofuran	CAT3b	CAT2	CAT2
109333-33-7	2-Bromo-3,7,8-trichlorodibenzodioxin	CAT3b	CAT2	CAT2
125652-16-6	6-Ethyl-1,3,8-trichlorodibenzofuran	CAT3b	CAT2	CAT2
97741-74-7	7-Bromo-2,3-dichlorodibenzodioxin	CAT3b	CAT2	CAT2
125652-13-3	6-i-Propyl-1,3,8-trichlorodibenzofuran	CAT3b	CAT2	CAT2
125652-12-2	6-t-Butyl-1,3,8-trichlorodibenzofuran	CAT3b	CAT2	CAT2
139883-51-5	6-Methyl-2,3,4,8-tetrachlorodibenzofuran	CAT3b	CAT2	CAT2
139883-50-4	8-Methyl-1,2,4,7-tetrachlorodibenzofuran	CAT3b	CAT2	CAT2
172486-00-9	8-Methyl-2,3,4,7-tetrachlorodibenzofuran	CAT3b	CAT2	CAT2
56-55-3	Benz(a)anthracene	CAT2	CAT2	CAT2
172485-99-3	8-Methyl-2,3,7-trichlorodibenzofuran	CAT3b	CAT2	CAT2
51630-58-1	Fenvalerate	CAT2	CAT2	CAT2
116-06-3	Aldicarb	CAT2	CAT3b	CAT2
16752-77-5	Methomyl	CAT2	CAT3b	CAT2
2597-11-7	1-Hydroxychlordene	CAT2	CAT3b	CAT2
93-76-5	2,4,5-T = 2,4,5-Trichlorophenoxyaceticacid	CAT2	CAT3b	CAT2
470-90-6	Chlorfenvinphos	CAT3a	CAT2	CAT2
584-79-2	Bioallethrin = d- trans allethrin	CAT2	CAT3b	CAT2
109333-32-6	2,8-Dibromo-3,7-dichlorodibenzodioxin	CAT3b	CAT2	CAT2
26002-80-2	Fenothrin = sumithrin	CAT2	CAT3b	CAT2
50585-40-5	2,3-Dibromo-7,8-dichlorodibenzodioxin	CAT3b	CAT2	CAT2
69409-94-5	Fluvalinate	CAT2	CAT3b	CAT2
52645-53-1	Permethrin	CAT2	CAT3b	CAT2
88378-55-6	3,5-Dichlorophenylcarbaminacid-(1-carboxy-1-methyl)-allyl	CAT2	CAT3b	CAT2
83792-61-4	N-(3,5-Dichlorophenyl)-2-hydroxy-2-methyl-3-butenacidamid	CAT2	CAT3b	CAT2
72490-01-8	Fenoxycarb	CAT3b	CAT2	CAT2
14409-72-4	4-Nonylphenolnonaethoxylat (Tergitol NP 9)	CAT3b	CAT2	CAT2
50585-46-1	1,3,7,8-Tetrachlorodibenzodioxin	CAT3b	CAT2	CAT2
52315-07-8	Cypermethrin	CAT3a	CAT2	CAT2
2593-15-9	Etridiazole	CAT2	CAT3b	CAT2
21725-46-2	Cyanazine	CAT2	CAT3b	CAT2
30560-19-1	Acephate	CAT2	CAT2	CAT2

CAS No.	NAME	Human health	Wildlife	Overall categorization
13171-21-6	Phosophamidon	CAT2	CAT3b	CAT2
7287-19-6	Prometryn	CAT2	CAT3b	CAT2
123-88-6	Triadimenol	CAT2	CAT3b	CAT2
52-68-6	Trichlorfon = Dipterex	CAT2	CAT3b	CAT2
1689-84-5	Bromoxynil	CAT2	CAT3b	CAT2
NoCAS 115	1,3,7,8-TeBCDD	CAT3b	CAT2	CAT2
NoCAS 112	1,2,4,7,8-PeCDD	CAT3b	CAT2	CAT2
109333-34-8	1,2,3,7,8-PeBDD	CAT3b	CAT2	CAT2
103456-39-9	TeBDD	CAT3b	CAT2	CAT2
319-86-8	Delta-HCH	CAT2	CAT3b	CAT2
1563-66-2	Carbofuran	CAT2	CAT2	CAT2
7786-34-7	Mevinphos = Phosdrin	CAT3a	CAT2	CAT2
51-03-6	Piperonyl butoxide	CAT3b	CAT2	CAT2
25085-99-8	Bisphenol A-diglycidylether polymer (mw<700)	CAT3b	CAT2	CAT2
131-57-7	2-hydroxy-4-methoxy-benzophenone	CAT2	CAT2	CAT2
2051-61-8	PCB 2 (3-Chlorobiphenyl)	CAT2	CAT3b	CAT2
2051-60-7	PCB 1 (2-Chlorobiphenyl)	CAT2	CAT3b	CAT2
1806-29-7	2,2'-Dihydroxybiphenyl = 2,2'-Biphenol	CAT2	CAT2	CAT2
81-92-5	2-[Bis(4-hydroxyphenyl)methyl]benzylalkohol = Phenolphthalol	CAT2	CAT3b	CAT2
6807-17-6	2,2-Bis(4-hydroxyphenyl)-4-methyl-n-pentane	CAT2	CAT3b	CAT2
2581-34-2	3-methyl-4-nitrophenol	CAT2	CAT3b	CAT2
14007-30-8	2,2-Bis(4-hydroxyphenyl)-n-hexane	CAT2	CAT3b	CAT2
100-02-7	4-nitrophenol	CAT2	CAT3b	CAT2
3115-49-9	4-nonylphenoxy acetic acid	CAT2	CAT2	CAT2
99-71-8	4-sec-Butylphenol = 4-(1-Methylpropyl)phenol	CAT2	CAT2	CAT2
20427-84-3	4-Nonylphenoldiethoxylate (NP2EO)	CAT2	CAT2	CAT2
84-69-5	Diisobutylphthalate	CAT2	CAT3b	CAT2
2051-62-9	PCB 3 (4-Chlorobiphenyl)	CAT2	CAT3b	CAT2
131-54-4	2,2'-Dihydroxy-4,4'-dimethoxybenzophenon	CAT2	CAT3b	CAT2
121-29-9	Pyrethrin	CAT2	CAT3b	CAT2
84-75-3	Di-n-hexyl phthalate (DnHP) = Di-hexylphthalate (DHP)	CAT2	CAT3b	CAT2
83-05-6	p,p'-DDA	CAT2	CAT2	CAT2
131-16-8	Di-n-propylphthalate (DprP) = Dipropylphthalate	CAT2	CAT3b	CAT2
106-44-5	p-cresol	CAT2	CAT3b	CAT2
2597-03-7	Elsan = Dimephenthoate	CAT3b	CAT2	CAT2
106340-44-7	Tetrabromodibenzofuran (TeBDF)	CAT2		CAT2
107555-93-1	1,2,3,7,8-Pentabromodibenzofuran			CAT2
56-38-2	Parathion = Parathion(-ethyl)	CAT2	CAT3	CAT2
121-75-5	Malathion	CAT2	CAT2	CAT2
298-00-0	Methylparathion	CAT3	CAT2	CAT2
39801-14-4	Photomirex	CAT2	CAT3	CAT2

CAS No.	NAME	Human health	Wildlife	Overall categorization
333-41-5	Diazinon	CAT3	CAT2	CAT2
75-15-0	Carbon disulphide	CAT2	CAT3	CAT2
330-54-1	Diuron	CAT2	CAT3	CAT2
36734-19-7	Iprodione	CAT2	CAT3	CAT2
115-32-2	Dicofol = Kelthane	CAT3	CAT2	CAT2
60-51-5	Dimethoate	CAT2	CAT3	CAT2
94-75-7	2,4-Dichlorophenoxy acetic acid (2,4-D)	CAT2	CAT2	CAT2
1570-64-5	4-chloro-2-methylphenol	CAT2	CAT3	CAT2
33213-65-9	Endosulfan (beta)	CAT2	CAT2	CAT2
959-98-8	Endosulfan (alpha)	CAT2	CAT2	CAT2
115-29-7	Endosulfan	CAT2	CAT2	CAT2
27304-13-8	Oxychlordane	CAT2	CAT3	CAT2
72-20-8	Endrin	CAT2	CAT2	CAT2
60-57-1	Dieldrin	CAT2	CAT2	CAT2
309-00-2	Aldrin	CAT2	CAT2	CAT2
28553-12-0	diisononyl phthalate = 1,2-Benzenedicarboxylic acid, diisononyl ester (DINP)	CAT2	CAT3	CAT2
10605-21-7	Carbendazim	CAT2	CAT3	CAT2
67747-09-5	Prochloraz	CAT2	CAT3	CAT2
71998-72-6	1,3,6,8-Tetrachlorodibenzofuran	CAT2		CAT2
33284-53-6	PCB 61 (2,3,4,5-Tetrachlorobiphenyl)	CAT2		CAT2
70362-47-9	PCB 48 (2,2',4,5-Tetrachlorobiphenyl)	CAT2		CAT2
38411-22-2	PCB 136 (2,2',3,3',6,6'-Hexachlorobiphenyl)	CAT2		CAT2
38380-08-4	PCB 156 (2,3,3',4,4',5-Hexachlorobiphenyl)	CAT2		CAT2
NoCAS 043	Octabrominated diphenyl ether (octaBDE)	CAT2		CAT2
NoCAS 044	Decabrominated diphenyl ether (decaBDE)	CAT2		CAT2
NoCAS 045	Pentabrominated diphenyl ether (pentaBDE)	CAT2		CAT2
26761-40-0	Diisodecyl phthalate	CAT2	CAT3	CAT2
1675-54-3	2,2'-bis(4-(2,3-epoxypropoxy)phenyl)propane = 2,2'-[(1-methylethylidene)bis(4,1-phenyleneoxymethylene)]bisoxirane	CAT2	CAT3	CAT2
74-83-9	Methylbromide (bromomethane)	CAT2	CAT3	CAT2
NoCAS 046	2,2',4,4'-Tetrabrominated diphenyl ether (2,2',4,4'-tetraBDE)	CAT2		CAT2
43121-43-3	Triadimefon	CAT2	CAT3	CAT2
58802-20-3	1,2,7,8-Tetrachlorodibenzofuran	CAT2		CAT2
709-98-8	Propanil	CAT2	CAT3	CAT2
98-54-4	4-tert-Butylphenol	CAT2	CAT2	CAT2
51207-31-9	2,3,7,8-Tetrachlorodibenzofuran	CAT2		CAT2
57117-41-6	1,2,3,7,8-Pentachlorodibenzofuran	CAT2		CAT2
120-83-2	2,4 Dichlorophenol	CAT2	CAT3	CAT2
76-44-8	Heptachlor	CAT2	CAT3	CAT2
83704-53-4	1,2,3,7,9-Pentachlorodibenzofuran	CAT2		CAT2

CAS No.	NAME	Human health	Wildlife	Overall categorization
90-43-7	o-phenylphenol	CAT2	CAT2	CAT2
127-18-4	Perchloroethylene	CAT2	CAT3	CAT2
122-34-9	Simazine	CAT2	CAT3	CAT2
137-30-4	Ziram	CAT2	CAT2	CAT2
59-50-7	4-chloro-3-methylphenol	CAT2	CAT3	CAT2
32598-12-2	PCB 75 (2,4,4',6-Tetrachlorobiphenyl)	CAT2		CAT2
67733-57-7	2,3,7,8-Tetrabromodibenzofuran	CAT2		CAT2

CAS No.	NAME	Human health	Wildlife	Overall categorization
2921-88-2	Chlorpyrifos	CAT3a	CAT3b	CAT3a
3734-48-3	Chlordene	CAT3a	CAT3b	CAT3a
40487-42-1	Pendimethalin	CAT3a	CAT3b	CAT3a
35367-38-5	Diflubenzuron	CAT3a	CAT3b	CAT3a
919-86-8	Demeton-s-methyl	CAT3a	CAT3b	CAT3a
62-73-7	Dichlorvos	CAT3a	CAT3b	CAT3a
1024-57-3	Heptachlor-epoxide	CAT3a	CAT3b	CAT3a
92-52-4	Diphenyl	CAT3a	CAT3b	CAT3a
17804-35-2	Benomyl	CAT3a	CAT3b	CAT3a
11141-17-6	Azadirachtin	CAT3a	CAT3b	CAT3a
299-84-3	Ronnel = fenchlorfos	CAT3a	CAT3b	CAT3a
22248-79-9	Tetrachlorvinphos = Gardona	CAT3a	CAT3b	CAT3a
71751-41-2	Abamectin	CAT3a	CAT3b	CAT3a
33089-61-1	Amitraz	CAT3a	CAT3b	CAT3a
51276-47-2	Glufosinate	CAT3a	CAT3b	CAT3a
2439-99-8	Glyphosate	CAT3a	CAT3b	CAT3a
3554-44-0	Imazalil	CAT3a	CAT3b	CAT3a
301-12-2	Oxydemeton-methyl	CAT3a	CAT3b	CAT3a
19044-88-3	Oryzalin	CAT3a	CAT3b	CAT3a
545-55-1	TEPA	CAT3a	CAT3b	CAT3a
537-98-4	Ferulic acid (FA)	CAT3a	CAT3b	CAT3a
104-51-8	n-Butylbenzene	CAT3a	CAT3b	CAT3a
314-40-9	Bromacil	CAT3a	CAT3b	CAT3a

CAS No.	NAME	Human health	Wildlife	Overall categorization
29082-74-4	Octachlorostyrene	CAT3b	CAT3b	CAT3b
88-85-7	Dinoseb	CAT3b	CAT3b	CAT3b
107534-96-3	Tebuconazole	CAT3b	CAT3b	CAT3b
74115-24-5	Clofentezine = chlorfentezine	CAT3b	CAT3b	CAT3b
119-61-9	Benzophenone	CAT3b	CAT3b	CAT3b
76674-21-0	Flutriafol	CAT3b	CAT3b	CAT3b
NoCAS 121	Epiconazol	CAT3b	CAT3b	CAT3b
55179-31-2	Bitertanol	CAT3b	CAT3b	CAT3b
106-47-8	4-chloroaniline	CAT3b	CAT3b	CAT3b
69806-50-4	Fluazifop-butyl	CAT3b	CAT3b	CAT3b
9014-90-8	Poly(oxy-1,2-ethanediyl), alpha-sulfo-omega-nonylphenoxy	CAT3b	CAT3b	CAT3b
88671-89-0	Myclobutanil	CAT3b	CAT3b	CAT3b

CAS No.	NAME	Human health	Wildlife	Overall categorization
53792-11-3	4-(4-Hydroxyphenyl)-2,2,6,6-tetramethylcyclohexanecarbonacid	CAT3b	CAT3b	CAT3b
23950-58-5	Pronamide	CAT3b	CAT3b	CAT3b
85535-86-0	Long chain chlorinated paraffins	CAT3b	CAT3b	CAT3b
117-84-0	1,2-Benzenedicarboxylic acid, dioctyl ester	CAT3b	CAT3b	CAT3b
1335-87-1	Halowax 1014	CAT3b	CAT3b	CAT3b
117-84-0	Di-n-octylphthalate (DnOP)	CAT3b	CAT3b	CAT3b
103-23-1	Bis(2-ethylhexyl)adipate	CAT3b	CAT3b	CAT3b
135-19-3	2-Naphthol	CAT3b	CAT3b	CAT3b
NoCAS 027	2,2,6,6-Tetramethyl-4,4-bis(4-hydroxyphenyl)-n-heptan	CAT3b	CAT3b	CAT3b
82-68-8	Pentachloronitrobenzene (PCNB)	CAT3b	CAT3b	CAT3b
80844-07-1	Ethofenprox	CAT3b	CAT3b	CAT3b
2717-05-5	Heptaoctatrikosan-1-ol, 23-(nonylphenoxy)3,6,9,12,15,18,21-nonylphenolmonoethoxylate	CAT3b	CAT3b	CAT3b
4685-14-7	Paraquat = 1,1'-dimethyl-4,4'-bipyridinium	CAT3b	CAT3b	CAT3b
60207-90-1	Propiconazole	CAT3b	CAT3b	CAT3b
108-05-4	Vinyl acetate	CAT3b	CAT3b	CAT3b
120068-37-3	Fipronil	CAT3b	CAT3b	CAT3b
66230-04-4	Esfenvalerate	CAT3b	CAT3b	CAT3b
119446-68-3	Difenoconazole	CAT3b	CAT3b	CAT3b
142-59-6	Nabam	CAT3b	CAT3b	CAT3b
NoCAS 008	Epoxiconazole	CAT3b	CAT3b	CAT3b
117718-60-2	Thiazopyr	CAT3b	CAT3b	CAT3b
29091-21-2	Prodiamine	CAT3b	CAT3b	CAT3b
66246-88-6	Penconazole	CAT3b	CAT3b	CAT3b
68-12-2	Dimethylformamide (DMFA)	CAT3b	CAT3b	CAT3b
2212-67-1	Molinate	CAT3b	CAT3b	CAT3b
94361-07-6	Cyproconazole	CAT3b	CAT3b	CAT3b
28994-41-4	Phenyl-2-hydroxyphenylmethane = 2-Benzylphenol = o-Benzylphenol	CAT3b		CAT3b
10448-09-6	Phenylheptamethylcyclotetrasiloxane [(PhMeSiO)(Me2SiO)3]	CAT3b	CAT3b	CAT3b
1322-97-0	Ethanol, 2-(octylphenoxy)- = Octyl-phenolethoxylate	CAT3b	CAT3b	CAT3b
56-33-7	Diphenyltetramethyldisiloxane PhMe2-SiOSiMe2Ph	CAT3b		CAT3b
17404-44-3	Phenol, 2-(1-ethylhexyl)-	CAT3b	CAT3b	CAT3b
1818-08-2	Phenol, 4-(1-methylheptyl)-	CAT3b	CAT3b	CAT3b
18626-98-7	Phenol, 2-(1-methylheptyl)-	CAT3b	CAT3b	CAT3b
26401-75-2	Phenol, 2-sec-octyl-	CAT3b	CAT3b	CAT3b
1009-11-6	4-Hydroxy-n-butyrophenone	CAT3b		CAT3b
14868-03-2	Bis-OH-MDDE	CAT3b		CAT3b
87-26-3	2-sec-Pentylphenol = 2-(1-Methylbutyl)phenol	CAT3b		CAT3b
7786-61-0	4-vinylguaiacol (4-VG)	CAT3b	CAT3b	CAT3b
2628-17-3	4-vinylphenol (4-VP)	CAT3b	CAT3b	CAT3b
25167-81-1	Dichlorophenol	CAT3b	CAT3b	CAT3b
620-92-8	Bis(4-hydroxyphenyl)methane	CAT3b		CAT3b

CAS No.	NAME	Human health	Wildlife	Overall categorization
70-70-2	4-Hydroxypropiophenone	CAT3b		CAT3b
303-38-8	2,3-dihydroxybenzoicacid (2,3-DHBA)	CAT3b		CAT3b
530-91-6	Tetrahydronaphthol-2	CAT3b		CAT3b
2540-82-1	Formothion	CAT3b		CAT3b
70393-85-0	Glufosinate-ammonium	CAT3b		CAT3b
114369-43-6	Fenbuconazole	CAT3b		CAT3
25550-58-7	Dinitrophenol	CAT3b		CAT3b
79-44-7	Dimethyl carbamyl chloride	CAT3b		CAT3b
490-79-9	2,5-dihydroxybenzoicacid (2,5-DHBA)	CAT3b		CAT3b
949-13-3	Phenol, 2-octyl-	CAT3b	CAT3b	CAT3b
463-56-9	Thiocyanate	CAT3b		CAT3b
53-96-3	n-2-fluorenylacetamide	CAT3b		CAT3b
1222-05-5	1,3,4,6,7,8-Hexahydro-4,6,6,7,8,8-hexamethylcyclopenta(g)-2-benzopyrane	CAT3b	CAT3b	CAT3b
13171-00-1	4-Acetyl-1,1-dimethyl-6-tert.-butylindane	CAT3b		CAT3b
33704-61-9	6,7-dihydro-1,1,2,3,3-pentamethyl-4(5H)indanone	CAT3b	CAT3b	CAT3b
118-56-9	3,3,5-trimethyl-cyclohexyl salicilate	CAT3b	CAT3b	CAT3b
533-73-3	Hydroxyhydroquinone	CAT3b		CAT3b
27214-47-7	Phenol, 4-sec-octyl-	CAT3b		CAT3b
24362-98-9	1,1-Bis(4-hydroxyphenyl)-n-hexane	CAT3b		CAT3b
3373-03-3	1,1-Bis(4-hydroxyphenyl)-n-heptane	CAT3b		CAT3b
90-15-3	1-Naphthol	CAT3b		CAT3b
1125-78-6	5,6,7,8-Tetrahydro-2-naphthol = 6-Hydroxytetralin	CAT3b		CAT3b
15231-91-1	6-Bromo-2-naphthol	CAT3b		CAT3b
682-80-4	Demefion	CAT3b	CAT3b	CAT3b
21245-02-3	2-ethyl-hexyl-4-dimethyl-aminobenzoate	CAT3b	CAT3b	CAT3b
52479-85-3	2,3,4,3',4',5'-Hexahydroxybenzophenon	CAT3b		CAT3b
27985-70-2	Phenol, (1-methylheptyl)-	CAT3b	CAT3b	CAT3b
27986-36-3	Ethanol, 2-(nonylphenoxy)-	CAT3b	CAT3b	CAT3b
3307-00-4	Phenol, 4-(1-ethylhexyl)-	CAT3b	CAT3b	CAT3b
3307-01-5	Phenol, 4-(1-propylpentyl)-	CAT3b	CAT3b	CAT3b
37631-10-0	Phenol, 2-(1-propylpentyl)-	CAT3b	CAT3b	CAT3b
3884-95-5	Phenol, 2-(1,1,3,3-tetramethylbutyl)-	CAT3b	CAT3b	CAT3b
2050-68-2	PCB 15 (4,4'-Dichlorobiphenyl)	CAT3b		CAT3b