

## **CERCLA Categories** **on the TURA Toxic or Hazardous Substance List** **23 MAY 2012**

CERCLA categories are listed under TURA, but by MassDEP policy, have never been reportable. Many of these categories are not unique - they include substances that are already specifically listed on the TURA chemical list. Many also cover substances that are no longer used in the US in manufacturing.

This summary provides a bit of background on the categories, then a brief overview of each category, describing which are covered by other reportable substances or EPCRA categories already on the list, and which are likely to have substances still used in commerce, but not covered elsewhere on the list. This is followed by some additional information on two particular categories: haloethers and phthalate esters.

### **BACKGROUND**

#### ***Where do these categories come from?***

The CERCLA chemical list is drawn from four other EPA media program lists. With the exception of coke oven emissions, which originates from the Clean Air Act, all of these other CERCLA categories originate with the list of Toxic Pollutants in the Clean Water Act (CWA) section 307, Toxic and Pretreatment Effluent Standards.

#### ***Has EPA defined which substances are included the CERCLA categories, either under CERCLA or the CWA?***

No, EPA has not defined the categories either under CWA or CERCLA.

**CERCLA:** While the CWA toxic substance categories are on the CERCLA list and are considered CERCLA hazardous substances, no reportable quantity under CERCLA has been assigned to these broad classes of compounds, and therefore, no specific compounds have had to be identified as being part of the categories.

**CWA:** The CWA Toxic Pollutant List of 65 chemicals and classes of chemicals was established in 1976. In an effort to develop a practical regulatory system for this list, EPA developed a CWA Priority Pollutant List of 129 specific substances. This list includes some substances that are part of the categories, selected in the 1970's because analytical methods existed to measure them, because they were known to have health and environmental effects, and because they were known to be discharged by major industries. Over the years, EPA has focused on water quality criteria and standards, effluent limits and industrial pre-treatment, but not on updating either the Toxic Pollutant List or the Priority Pollutant List.

## **CERCLA CATEGORIES**

**Chlordane (technical mixture and metabolites) 1005** - The specific chemical Chlordane is on TURA list. Use of Chlordane is now banned in US.

**Chlorinated Benzenes 1006** - Most chlorobenzenes that are used in commerce are listed specifically on TURA. There are a few that are used in small amounts or listed under TSCA that are not on the TURA list.

**Chlorinated Ethanes 1007**- All commonly used substances are specifically listed on TURA list.

**Chlorinated Naphthalene 1008** - No longer manufactured in US, may be very small import for dielectric fluid.

**Chloroalkyl Ethers 1011** - All commonly used substances are specifically listed on TURA list.

**Coke Oven Emissions 1014** – byproduct, not used in manufacturing.

**DDT and Metabolites 1017** – DDT and congeners listed specifically on TURA, no longer in commerce.

**Dichlorobenzidine 1018** – 3,3-dichlorobenzidine specifically listed on TURA.

**Diphenylhydrazine 1019** – 1,2 diphenylhydrazine specifically listed on TURA.

**Endosulfan and metabolites 1020** – Endosulfan specifically listed on TURA, use banned in US.

**Endrin and metabolites 1021** – Endrin specifically listed on TURA, registration cancelled in US.

### **Haloethers 1023**

Broad category of substances with chlorine, bromine, fluorine and/or iodine attached to the aryl or alkyl group, and an ether moiety. Substances known to be in this category that are not on the TURA list include the flame retardants tetra-, penta-, and octa-bromodiphenyl ether. Those particular substances have been voluntarily phased out of production in the US. This category would also include Triclosan (2,4,4-trichloro-2-hydroxydiphenyl ether)(antibacterial widely used in consumer products), and hydrofluoroethers (HFEs) (used as solvents and refrigerants). (see separate section)

**Halomethanes 1024** – Many are already listed specifically on the TURA list, all others would be included in a potential halogenated hydrocarbons with 4 or fewer carbons category. This category includes many refrigerants and solvents.

**Heptachlor and metabolites 1025** – Heptachlor listed specifically on TURA. Most uses phased out.

**Nitrophenols 1030** – One CAS # which includes mixed isomers is specifically listed on TURA. Additional CAS #s for individual m-, o-, and p- isomers are not on list.

**Nitrosamines 1031** – Several common nitrosamines are listed specifically on TURA, including NDMA and NDPA. At least 2 individual substances, n-nitrosomethylethylamine (NMEA) and Nicotine-derived nitrosamine ketone (NNK) are not on the list.

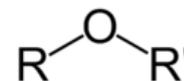
**Phthalate Esters 1033**

Phthalate esters are commonly used plasticizers in polymeric materials, particularly in PVC. Of 34 identified phthalate esters, 6 are on the TURA list. Many that are in common use, e.g., Diisobutyl phthalate (DIBP) are not on the TURA list. (see separate section)

**Polynuclear Aromatic Hydrocarbons 1035** – similar EPCRA category Polycyclic Aromatic Compounds is on the TURA list, although the EPCRA category only includes a specific list of PACs.

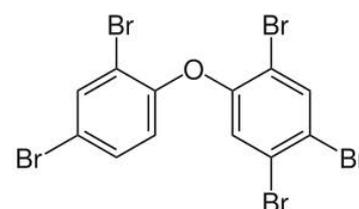
## Haloethers

The general structure of an **ether**, is an oxygen atom connecting 2 alkyl or aryl functional groups.



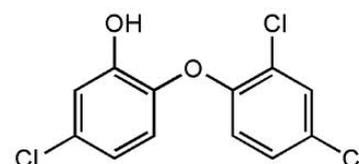
A haloether has one or more halogen atoms (chlorine, bromine, fluorine or iodine) attached to the alkyl (hydrocarbon) or aryl (aromatic hydrocarbon) groups. The following are examples of haloethers, together with their chemical structures.

**Penta-bromo diphenyl ether (PentaBDE).** A flame retardant used commonly in the past in polyurethane foams. US manufacturers have voluntarily agreed to cease manufacturing pentaBDE, as well as octa-BDE. The only polybrominated diphenyl ether (PBDE) on the TURA list is deca-BDE (fully brominated). They are persistent in the environment, bioaccumulative and toxic. They have been found widely in wildlife, human milk and serum and other biota, including in the arctic. The lower brominated congeners (e.g., tetra- and penta-) are more toxic than the higher brominated congeners. There is evidence of reproductive toxicity, neurotoxicity and liver toxicity from animal test data.



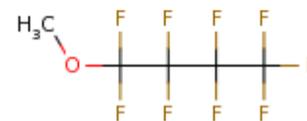
### **Triclosan** 2,4,4'-trichloro-2'-hydroxydiphenyl ether

Triclosan is a widely used antibacterial and antifungal agent, particularly in consumer products, including soaps, toothpastes, deodorants, and plastic products. There are concerns about the development of bacterial resistance, and some evidence of contact dermatitis and endocrine disruption in amphibians. Triclosan is toxic to aquatic environments (by design it is toxic to bacteria and fungi), and is at least somewhat persistent, as it is being found in the environment.



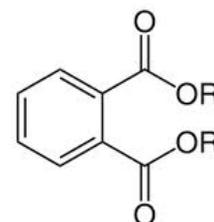
### **Hydrofluoroethers (HFEs)**

Hydrofluoroethers are high performance materials used as solvents in precision cleaning applications, and as refrigerants and heat transfer fluids. They were introduced because they are not ozone depleting, but they are greenhouse gases. They are quite persistent in air. The TURA Science Advisory Board is currently reviewing these substances as alternatives to TCE and perc, to see if any should be added to the TURA list.



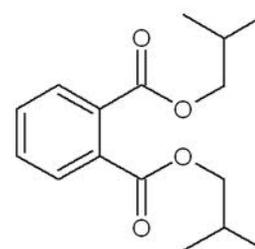
## Phthalate Esters

Phthalate esters are esters of phthalic acid. They are widely used as plasticizers in plastics, and as stabilizers, emulsifying agents and lubricants in coatings, paints and other preparations. While several of the most commonly used phthalates (e.g., DEHP) are on the TURA list, there are many now in use that are not. Below is one example, and a list of common phthalates.



### **DIBP Diisobutyl phthalate (CAS 84-69-5)**

DIBP is used, often in combination with other phthalates, as a gelling aid and is used in paints, inks and adhesives. It is also used as a plasticizer in PVC and rubber. DIBP is metabolized to MIBP (monoisobutyl phthalate) in humans. It has low acute toxicity, but there are concerns with liver toxicity and developmental toxicity. There are significant data gaps for DIBP.



Common Abbrev.	Common Name	CAS No.	TURA Listed	Other <sup>1</sup>
DMP	Dimethyl phthalate	131-11-3	Yes	
DEP	Diethyl phthalate	84-66-2	Yes	
DIBP	Diisobutyl phthalate	84-69-5	No	SVHC; EPA CAP
DBP	Dibutyl phthalate	84-74-2	Yes	SVHC; EPA CAP
	Bis(2-methoxyethyl) phthalate	117-82-8	No	SVHC
	Diisohexyl phthalate	71850-09-4	No	
DnPP	Diamyl phthalate	131-18-0	No	EPA CAP
	Bis(2-ethoxyethyl) phthalate	605-54-9	No	
	Hexyl 2-ethylhexyl phthalate	75673-16-4	No	
	Dihexyl phthalate	84-75-3	No	
BBP	Butyl benzyl phthalate	85-68-7	Yes	SVHC; EPA CAP
	Bis(2-n-butoxyethyl) phthalate	117-83-9	No	
DEHP	Di(2-ethylhexyl) phthalate	117-81-7	Yes	SVHC; EPA CAP
DCHP	Dicyclohexyl phthalate	84-61-7	No	
DnOP	Di-n-octyl phthalate	117-84-0	Yes	EPA CAP
	Dimonyl phthalate	84-76-4	No	
	Benzyl benzoate	120-51-4	No	
	Diphenyl phthalate	84-62-8	No	
	Diphenyl isophthalate	744-45-6	No	
	Benzyl phthalate	523-31-9	No	
	Bis(4-methyl-2-pentyl) phthalate	146-50-9	No	
DMIP	Dimethyl isophthalate	1459-93-4	No	

	Diethyl terephthalate	636-09-9	No	
DOIP	Di-2-ethylhexyl isophthalate	137-89-3	No	
DINP	Diisononyl phthalate	28553-12-0	No	EPA CAP
DIDP	Diisodecyl phthalate	26761-40-0	No	EPA CAP
DDP	Didecyl phthalate	84-77-5	No	
DUP	Diundecyl phthalate	3648-20-2	No	
	Di-n-dodecyl phthalate	2432-90-8	No	
DTDP	Ditridecyl phthalate	119-06-2	No	
	Diisobutyl phthalate	84-69-5	No	SVHC
	Texanol® benzyl phthalate	16883-83-3	No	
DIOP	Diisooctyl phthalate	27554-26-3	No	
DPHP	Di-2-propyl heptyl phthalate	53306-54-0	No	

1. SVHC = European Union REACH Substances of Very High Concern Candidate List, candidates for authorization. Reason for listing – reproductive toxicity.
2. EPA CAP = US Environmental Protection Agency TSCA Phthalate Ester Chemical Action Plan; reproductive and developmental toxicity concerns, particularly for phthalates with linear ester side chains with 4-6 carbons.