



Review Statement for the OSPAR Background
Document on trichlorobenzenes



OSPAR Convention

The Convention for the Protection of the Marine Environment of the North-East Atlantic (the "OSPAR Convention") was opened for signature at the Ministerial Meeting of the former Oslo and Paris Commissions in Paris on 22 September 1992. The Convention entered into force on 25 March 1998. It has been ratified by Belgium, Denmark, Finland, France, Germany, Iceland, Ireland, Luxembourg, Netherlands, Norway, Portugal, Sweden, Switzerland and the United Kingdom and approved by the European Community and Spain.

Convention OSPAR

La Convention pour la protection du milieu marin de l'Atlantique du Nord-Est, dite Convention OSPAR, a été ouverte à la signature à la réunion ministérielle des anciennes Commissions d'Oslo et de Paris, à Paris le 22 septembre 1992. La Convention est entrée en vigueur le 25 mars 1998. La Convention a été ratifiée par l'Allemagne, la Belgique, le Danemark, la Finlande, la France, l'Irlande, l'Islande, le Luxembourg, la Norvège, les Pays-Bas, le Portugal, le Royaume-Uni de Grande Bretagne et d'Irlande du Nord, la Suède et la Suisse et approuvée par la Communauté européenne et l'Espagne.

Contents

Introduction	4
Progress in implementing and completing agreed actions	4
New information on the occurrence in the environment.....	5
Further work needed.....	7

Introduction

OSPAR Background Documents are periodically reviewed and revised, as necessary, to take account of the latest information, so that any additional risks to the marine environment can be highlighted and additional measures and controls can be acknowledged.

In cases where a revision was not advised, a Review Statement supplementing the Background Document is prepared by lead countries, highlighting new developments since the adoption of the Background Document. The Review Statement will be updated, as appropriate, with information on progress on the actions that are agreed in Background Documents.

The OSPAR Background Document on trichlorobenzenes was first published in 2003 and updated in 2005 with a monitoring strategy for trichlorobenzenes (OSPAR publication number 170/2005). Following a review by the OSPAR Hazardous Substances Committee in 2010, this Review Statement, prepared by Belgium as the lead country for this chemical, was adopted.

Progress in implementing and completing agreed actions

The Background Document on trichlorobenzenes recommended various measures and some of them have been implemented as described hereafter.

A monitoring strategy for trichlorobenzenes was proposed by the lead countries (Belgium and Luxembourg) and attached to update the Background Document in 2005.

The OSPAR Background Document recommended that the lead countries for polychlorinated biphenyls (PCBs) (Belgium and Germany) should report in their revision on the PCB Background Document on the current situation of substitution of PCBs, used in transformers, with trichlorobenzenes. As the current PCB Background Document does not provide any indication on this issue, this recommendation remains valid.

The Directive 2008/105/EC of the European Parliament and of the Council of 16 December 2008, which was required to support the Water Framework Directive (WFD), sets environmental quality standards in surface waters for dangerous substances, among them trichlorobenzenes (Table 1). This Directive considers TCB as “priority substance” but not as “priority hazardous substance”. According to WFD, the consequence is the progressive reduction of discharges, emissions and losses of the concerned substances.

Table 1: Extract from Annex I of the Directive 2008/105/EC establishing environmental quality standards [µg/L] for substances, including trichlorobenzenes

N°	Name of substance	CAS number	AA-EQS Inland surface waters	AA-EQS Other surface waters	MAC-EQS Inland surface waters	MAC-EQS Other surface waters
(31)	Trichlorobenzenes	12002-48-1	0,4	0,4	Not applicable	Not applicable

AA-EQS: annual average environmental quality standard;

MAC-EQS: maximum allowable concentration environmental quality standard.

¹ DIRECTIVE 2008/105/EC OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL of 16 December 2008 on environmental quality standards in the field of water policy, amending and subsequently repealing Council Directives 82/176/EEC, 83/513/EEC, 84/156/EEC, 84/491/EEC, 86/280/EEC and amending Directive 2000/60/EC of the European Parliament and of the Council

As requested by the WFD “Member States shall establish an inventory, including maps, if available, of emissions, discharges and losses of all priority substances”. These inventories shall be communicated to the European Commission. Monitoring programmes shall be established in order to check the compliance of the measured concentration in bodies of surface water with the Environmental Quality Standards (EQS) values defined by the Directive 2008/105/EC. This applies also to trichlorobenzenes and will complement the monitoring programme defined in the updated OSPAR Background Document.

The EU Risk Assessment Report (RAR) on trichlorobenzenes² was finalised and takes account of the information compiled in the OSPAR Background Document, thanks to the rapporteur within the EU on TCB (Denmark). This ensures the consistency of approach in both international organisations.

New information on the occurrence in the environment

Presently, only one producer in Europe (Lanxess Deutschland GmbH in Germany) is selling and using trichlorobenzenes and this only as an intermediate. The release to water from production is estimated at about 30 kg/year. According to the producer 2000 t/year of 1,2,4-trichlorobenzene is being sold to the USA as intermediate for the production of an herbicide and 400 t/year is used in Europe by Bayer Crop Science for the production of the herbicide Aclonifen.

Based upon the information of the implementation of the results of the EU RAR, trichlorobenzenes are only used as chemical intermediates, specifically for the production of herbicides, pigments and dyes. The use as solvents, as dielectric fluids, as component in synthetic oils, lubricants and heat transfer fluids, in degreasing agents, cleaning agents for septic tanks and in abrasive formulations has been phased out in Europe.

As trichlorobenzenes are included in the list of substances to be monitored in the framework of the European Pollutant Release and Transfer Register (E-PRTR) reporting system, some releases emissions and transfer levels are available for the year 2007 and are summarized in Table 2 and 3 hereafter.

Table 2: Transfer of trichlorobenzenes in the year 2007 according to E-PRTR data base

E-PRTR Data Year 2007	Activities	Amounts	Number of facilities
Transfer per industrial activities	Chemical industry	65.7 kg	3
	Waste and waste water management	5.01 kg	3
	Total transfer	70.7 kg	6

Table 3: Releases of trichlorobenzenes in the year 2007 according to E-PRTR data base

E-PRTR Data Year 2007	Activities	Amounts released in		Number of facilities
		air	water	
Pollutant releases	Production and processing of metals	-	137 kg	1
	Mineral industry	24.9 kg	-	1
	Chemical industry	204 kg	1.57 t	3
	Waste and waste water management	147 kg	398 kg	18
	Total releases	375 kg	2.11 t	23

² European Union Risk Assessment Report on 1,2,4-trichlorobenzene (EINECS No: 204-428-0 CAS No: 120-82-1), Existing Substances 2nd Priority List Volume: 26, published by the European Commission Joint Research Center, Institute for Health and Consumer Protection and available at http://ecb.jrc.it/DOCUMENTS/Existing-Chemicals/RISK_ASSESSMENT/REPORT/trichlorobenzenereport039.pdf

In the framework of the WFD implementation programme, INERIS and the International Office for Water (France) collected and compiled existing monitoring data from EU Member States. A statistical analysis and a quality check of the data were carried out and the observed concentrations aggregated at European level. The data base is available on line at <http://www.priority.substances.wfd.oieau.fr/>

The trichlorobenzenes were monitored in many European countries and the aggregated concentrations are reported in the following Tables 4 and 5 for 1,2,4-trichlorobenzene and 1,2,3-trichlorobenzene, respectively.

Table 4: Monitoring data of 1,2,4-trichlorobenzene in surface waters (river, lake, transitional and coastal) aggregated at EU level and expressed in µg/l for water and in µg/kg dw for sediment

Media	Number of analyses	Minimum observed	Maximum observed	Mean value	Standard deviation	Median	90 th percentile
Water *	855	0	2.5	0.09	0.33	0.03	0.05
Water **	27915	0	1020	0.13	6.11	0.03	0.25
Sediment (fraction <20µm)	1472	0.05	310	13.48	27.53	5	35
Sediment (whole)	231	0.05	700	70.68	161.59	5	206

*Value for the water phase after separation of the suspended matter

** Value for the water phase containing suspended matter (whole water)

Table 5: Monitoring data of 1,2,3-trichlorobenzene in surface waters (river, lake, transitional and coastal) aggregated at EU level and expressed in µg/l for water, in µg/kg dw for sediment and in µg/kg ww for fish

Media	Number of analyses	Minimum observed	Maximum observed	Mean value	Standard deviation	Median	90 th percentile
Water *	18333	0	50	0.2	0.45	0.1	0.5
Water **	24917	0	5	0.04	0.08	0.01	0.05
Sediment (fraction <20µm)	1266	0.5	600	7.28	24.33	1.2	10
Sediment (whole)	4522	0.03	25000	234.33	1270.33	5	50
Fish muscle	68	1	45	8.26	7.62	5	15

*Value for the water phase after separation of the suspended matter

** Value for the water phase containing suspended matter (whole water)

A review of the persistence, bioaccumulation and toxicity (PBT) properties of trichlorobenzenes was carried out during the preparation of Directive 2008/105/EC. This review (available under the EU circa website and listed as EA F(7)-07-01 PHS Report dated 4 June 2004 - <http://circa.europa.eu/>) provided the following conclusion: *"The available screening test data together with a few data concerning half-lives at environmentally more realistic conditions suggests that 1,2,4-TCB should be considered fulfilling the P-criterion. The substance just fulfils the B criterion, but does not fulfil the T criterion, although the lowest aquatic NOECs are not very far from the cut-off value, and some uncertainty still remains regarding mammalian toxicity. However because of an extremely high stability in the atmosphere and other intrinsic environmental fate related properties, 1,2,4-TCB has a very significant intrinsic potential for long-range environmental transport via the air compartment, which is considered as "equivalent level of concern".* Consequently, trichlorobenzenes were not considered as priority hazardous substance under the WFD.

In 2006, a marine risk assessment with special emphasis on OSPAR Region II – the Greater North Sea – has been published (D. Van Wijck et al. Chemosphere 62, pp 1294-1310).

“It was concluded that no risks are expected for aquatic organisms. Based on the combination of worst-case assumptions risks to benthic organisms could not be fully excluded, but since all open uses of 1,2,4-trichlorobenzene will be ended following the EU risk assessment outcome of 2001, any potential risk is expected to be reduced accordingly. 1,2,4-trichlorobenzene is not considered toxic according to the EU criteria and the available data on persistence of 1,2,4-trichlorobenzene indicate a half-life in water of a few days and a significant biodegradation potential. The bioaccumulation potential is low to moderate with most BCF³ ratios for fish ranging from 600 to 1400. Based on an extensive evaluation of persistence, biodegradation and bioaccumulation data it is concluded that 1,2,4-trichlorobenzene is not a PBT, since it does not fulfil any of the EU criteria. Bio-magnification in the food chain is not expected due to the relatively high elimination rate constants”.

Further work needed

It is foreseen that the list of the priority substances from the WFD should be included in the appropriate EU reference document on Best Available Techniques (BREF documents) under the EU Integrated Pollution Prevention and Control (IPPC) Directive 2008/1/EC. This is a good opportunity for the OSPAR lead countries or the relevant OSPAR Committee to examine BREFs on fine chemicals and the textile industry (with the Netherlands and Belgium respectively in the lead) to ensure that those BREFs take appropriate account of the conclusions of the OSPAR Background Document on trichlorobenzenes and this review statement, and to report to the OSPAR Commission accordingly in their reports on those BREFs.

On the basis of the recent monitoring data collected in the context of the WFD, it could be appropriate that OSPAR Contracting Parties identify the historical sites and the sinks for trichlorobenzenes and consider the requirements for investigation of remediation needs.

³ Bioconcentration factor



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**OSPAR's vision is of a healthy and diverse North-East Atlantic ecosystem,
used sustainably**

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