



Review Statement for the OSPAR Background
Document on cadmium



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.

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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 cadmium was first published in 2002 and updated in 2004 with a monitoring strategy for cadmium (OSPAR publication number 151/2002). Following a review by the OSPAR Hazardous Substances Committee in 2009, this Review Statement, prepared by Spain as the lead country for this chemical, was adopted.

1. New monitoring data and information

New information is addressed from different sources, specially the OSPAR Commission (www.ospar.org), the UN Economic Commission for Europe (ECE) Long-Range Transboundary Transport of Air Pollutants (LRTAP) Convention (www.unece.org), HELCOM Convention (www.helcom.fi) on the reduction of Cadmium inputs to the North Sea/North East Atlantic and the Baltic Sea, and relevant scientific publications.

1.1 Marine aquatic compartment

1.1.1 Riverine discharges

The latest OSPAR scientific assessment of data collected over 16 years (1990–2006) of riverine inputs and direct discharges to the sea shows substantial reductions in inputs of cadmium in the OSPAR Regions (OSPAR, 2009a). Most reduction took place however in the 1990s. At regional level, statistically significant reductions of riverine inputs were observed for the period 1990–2006 of 40% in Region I (Arctic Waters), 20% in Region II (Greater North Sea) and 60% in Region III (Celtic Seas).

1.1.2 Losses by leaching from sea ships

Recent estimates of losses of cadmium by leaching from anodes (hulls and ballast tanks) suggest that 0.201 tons of cadmium were lost in 2007 in Region II (Greater North Sea) (OSPAR, 2009c). This is a minor fraction of inputs of cadmium to Region II.

1.1.3 Levels in sediments

The series of annual OSPAR assessments of data collected under the Coordinated Environmental Monitoring Programme shows that concentrations of cadmium in the marine environment have generally decreased over the period 1990 to 2007 where trends can be detected but have not been consistently upwards or downwards over the last ten years.

In sediments, concentrations of cadmium are generally near or just above background. However, concentrations in some areas, such as around the industrial estuaries of the Rhine, Seine, Tyne, Tees, Thames as well as in certain industrialised estuaries in Norway (Inner Sør fjord) and Spain (Ria de Pontevedra) and the inner German Bight are at levels giving rise to risk of pollution effects (OSPAR 2009e).

1.2. Atmospheric compartment

1.2.1 Air emissions

Although air emissions of cadmium were still significant in 2006 in the OSPAR Regions (around 40 tonnes), the analysis of the emissions data has shown that cadmium emissions¹, significantly decreased in most OSPAR countries during the period 1990–2006, although emissions levels have clearly stagnated since 2000 (OSPAR, 2009b). The total emissions of cadmium decreased for all OSPAR countries by 61%. This percentage is higher than the emission decrease in Europe as a whole (50%) because of less pronounced emission reductions in Central and Eastern European countries. Comparatively, cadmium emissions in Poland and the Russian Federation in 2005 were 46 t/y and 59.4 t/y, respectively. Both national emission figures are each comparable with the total emissions of all OSPAR countries in 2005 (43 t/y). Emissions in Poland and the Russian Federation were included in the consideration because of their large contribution to heavy metal deposition over the OSPAR maritime area. This results in an increase of cadmium emissions for the Region I (+20%).

Regarding changes of anthropogenic emissions of cadmium in the OSPAR countries, the highest reduction of cadmium emissions took place in the United Kingdom (84%) while emissions in Portugal increased by 6%. The largest emitters of cadmium among the OSPAR countries in 1990 were the United Kingdom, Spain and France. In spite of the fact that emissions in Spain decreased by 30% for the considered period, they remained the most significant contribution in 2005 and amounted to 16.7 t/y (OSPAR, 2008a).

In order to assess the contribution of different emission sources to heavy metal depositions to the OSPAR regions a complete set of sector emissions data was prepared for 2005:

- **Sector 1** Combustion in power plants and industry & Industrial processes;
- **Sector 2** Transport;
- **Sector 3** Commercial, residential and other combustion;
- **Sector 4** Waste.

EMEP model calculations suggest that the sector “combustion in power plants and industry & Industrial processes” makes up the largest contribution to cadmium deposition (85%) (OSPAR, 2009b). The contribution of Sector 1 to anthropogenic depositions of cadmium to the OSPAR Regions in 2005 varies from 69% in Region II (Greater North Sea) to 91% in Region IV (Bay of Biscay and Iberian Coast) (OSPAR, 2008a). The second most important sector for cadmium depositions is Sector 3 “Commercial, residential and other combustion”. Its contribution to anthropogenic depositions is the highest in Region I (23%) and the lowest in Region IV (4.2%). In Region II, the contribution of Sector 3 can exceed the 40% in the Kattegat and Skagerrak.

Similar results have been published by Pacyna et al. (2009), who indicates that total cadmium emissions in Europe were reduced by about 60%, and in Scandinavia about 80%. This corresponds well with the reduction of cadmium concentrations in the air (about 70%). Same tendencies are shown by EMEP (2006) and HELCOM (2006). According to official data and expert estimates, cadmium emissions from HELCOM countries decreased by 26% between 1996 and 2000, while emissions in the entire EMEP region decreased by 22%. Decreasing emission trends for cadmium can also be observed taking into account the analysis of decreased trends of concentrations in mosses between 1990 and 2000 by 42% (Harmens et al., 2008).

¹ based on the application of a heavy metal model developed by EMEP/MSC-E (MSCE-HM), cf. OSPAR 2008a

1.2.2 Atmospheric deposition

Atmospheric deposition was assessed through available monitoring data from the OSPAR Comprehensive Atmospheric Monitoring Programme (CAMP) (OSPAR, 2008b). EMEP model calculations suggest varied but continuous decline in atmospheric net deposition of cadmium to all OSPAR regions in 1998–2006, except Region V which has seen an increase of 5%. The highest decrease of total depositions took place in Region II (Greater North Sea) and reached up to 30% for cadmium. The lowest decrease was obtained for Region III (Celtic Seas) and Region IV (Bay of Biscay) with 1% and 4% respectively. In general, the decrease in deposition was lower than that in emissions because of the effect of wind re-suspension of previous atmospheric depositions accumulated in soil and seawater.

These reduction trends are also confirmed by Harmens et al. (2008), who concludes that cadmium emissions and depositions in Europe decreased about 4 and 3 times, respectively, between 1980 and 2000 and the highest decline was observed between 1985 and 1990 (Ilyin et al., 2004).

Deposition of cadmium in 2008 based on coastal observations of cadmium in precipitation was lowest in Region I where atmospheric deposition is however a dominant pathway of cadmium to the sea. Highest deposition is found in coastal areas, especially Region II (OSPAR, 2008b; 2010).

1.3 Biota compartment

Data from OSPAR (2007) indicated that mean concentrations in shellfish were below the background assessment concentration (BAC) at 71% of shellfish stations. In general, and except in some high activity points, concentrations in biota are acceptable and below the BAC². This is consistent with a downward trend in the annual discharges of cadmium and decreases of atmospheric deposition.

The recent OSPAR assessment of data collected under the Coordinated Environmental Monitoring Programme shows that concentrations of cadmium in fish and shellfish were above EU dietary limits in some of these areas (OSPAR, 2009d). The high concentrations are mainly found around the coasts of Denmark, and at occasional locations in the UK, France, and also in Iceland and Norway where geological factors are likely to increase concentrations locally. Concentrations in fish and shellfish are at or below background assessment criteria at a good proportion of sites in Northern Spain, the Bay of Biscay, the Channel coast of France and parts of Ireland and Scotland. Elsewhere, concentrations are above background. Monitoring data from OSPAR Region V is scarce.

2. Progress of actions

A letter was sent to the **European Commission** on November 2002 to take forward some of the recommendations proposed in the Background Document on cadmium. The progress of actions mentioned below shows that this request has been considered through different legislative and guidance publications.

This section compiles a summary of the progress of the actions recommended in the Background Document regarding the following areas:

2.1 Industrial sources

- a. Non-ferrous metal production and processing (lead country Spain): HSC 2003 agreed that there was no need to revise OSPAR Recommendation 98/1 concerning BAT/BEP for the Primary Non-Ferrous Metal Industry (Zinc, Copper, Lead and Nickel Works);

² Background Assessment Concentration (1.940 µg/kg dry weight) (OSPAR, 2009f)

- b. Secondary iron and steel industry (lead country Sweden): HSC 2003 agreed that for the time being there is no need to revise PARCOM Recommendations 90/1, 91/3 and 92/3.

As related information to future potential reductions in emissions of cadmium, among other metals, a reference document on Best Available Techniques for "Ceramic Manufacturing Industry" has been formally adopted by the European Commission in 2007, and has been also considered.

2.2 Batteries

Directive 2006/66/EC of the European Parliament and of the Council of 6 September 2006 on batteries and accumulators and waste batteries and accumulators repeals Directive 91/157/EEC.

The directive prohibits the placing on the market of certain batteries and accumulators with a proportional, mercury or cadmium, content above a fixed threshold. In addition, it promotes a high rate of collection and recycling of waste batteries and accumulators and improvement in the environmental performance of all involved in the life-cycle of batteries and accumulators, including their recycling and disposal.

The aim is to cut the amount of hazardous substances - in particular, mercury, cadmium and lead - dumped in the environment; this should be done by reducing the use of these substances in batteries and accumulators and by treating and re-using the amounts that are used. It applies to all types of batteries and accumulators, apart from those used in equipment to protect Member States' security or for military purposes, or in equipment designed to be sent into space. It therefore covers a wider range of products than Directive 91/157/EEC, which applied only to batteries containing mercury, lead or cadmium, and excluded "button cells".

2.3 Sewage sludge

Council Regulation (EC) No 807/2003 of 14 April 2003 adapting to Decision 1999/468/EC the provisions relating to committees which assist the Commission in the exercise of its implementing powers laid down in Council instruments adopted in accordance with the consultation procedure (unanimity): the Regulation amends Council Directive 86/278/EEC of 12 June 1986 on the protection of the environment and in particular of the soil, when sewage sludge is used in agriculture.

2.4 Chemical fertilisers

Fertilisers can be contaminated by substances that can potentially pose a risk to human and animal health and the environment.

The rules governing the composition of fertilisers covered by **Regulation (EC) No 2003/2003** do not provide for a limit value for the cadmium content of EC-designated fertilisers. Recital 15 of the Regulation announces that the Commission will address the issue of unintentional cadmium content in mineral fertilisers and will, where appropriate, draw-up a proposal for a Regulation and will present it to the European Parliament and the Council. Further to the previous opinion of the Scientific Committee on Toxicity, Ecotoxicity and the Environment (SCTEE), a limit for cadmium in phosphate fertilisers should be derived based on a risk assessment approach and taking all cadmium sources into account³.

³ SCTEE's opinion on Member State assessments of the risk to health and the environment from cadmium in fertilisers. Opinion expressed at the 33rd SCTEE Plenary meeting, Brussels, 24 September 2002. <http://europa.eu.int/comm/enterprise/chemicals/legislation/fertilizers/cadmium/sctee.pdf>

In this effect, a common position⁴ was reached in 2003 which indicated the deletion of the proposed Article 33 on cadmium content in fertilisers, including the provision on derogations for Austria, Finland and Sweden. The three Member States have now received derogation from the currently existing provisions through the procedure set out in Article 95 (4) of the Treaty. By way of an interpretative provision it is ensured that the Member States concerned can maintain their derogation also after the repeal of the existing legislation on the date of entry into force of this Regulation (Article 35):

Commission Decision 2006/349/EC allows Austria to prohibit the placing on the national market of phosphorous mineral fertilisers with a cadmium content exceeding 75 mg/kg P₂O₅.

Commission Decision 2006/348/EC allows Finland to prohibit the placing on the national market of phosphorous mineral fertilisers with a cadmium content exceeding 50 mg for each kilogram of phosphorus.

Commission Decision 2006/347/EC allows Sweden to prohibit the placing on the national market of phosphorous mineral fertilisers with a cadmium content exceeding 100 grams per tonne of phosphorous.

Commission Regulation (EC) No 889/2008 of 5 September 2008 laying down detailed rules for the implementation of Council Regulation (EC) No 834/2007 on organic production and labelling of organic products with regard to organic production, labelling of organic products: the Regulation repeals Regulation (EEC) No 2092/91 and indicates cadmium content of different type of fertilisers (soft ground rock phosphate, aluminium-calcium phosphate and composted or fermented household waste).

A reference document on Best Available Techniques in the “Large Volume inorganic Chemicals, Ammonia, Acid and Fertilisers Industries” was formally adopted by the European Commission in 2007, in which the reduction of cadmium levels in waste gypsum is also considered.

2.5 Waste disposal

The communication from the Commission to the Council, the European Parliament, the European Economic and Social Committee and the Committee of the Regions: Taking sustainable use of resources forward: **A Thematic Strategy on the prevention and recycling of waste** (COM(2005) 666 final) considers hazardous wastes.

Directive 2006/12/EC on waste (waste framework directive) in order to limit the generation of waste and optimise the organization of waste treatment and disposal, and the reference document on the Best available Techniques for “**Waste Incineration**” (European Commission, 2008)”, in which there are chapters for the reduction of heavy metals.

2.6 Waste (Mining activities)

Directive 2003/105/EC⁵ includes in its scope mineral processing of ores and, in particular, tailings ponds or dams used in connection with such mineral processing. It also includes the exploitation (exploration, extraction and processing) of minerals in mines, quarries, or by means of boreholes, with the exception of chemical and thermal processing operations and storage related to those operations which involve dangerous substances.

⁴ Common Position (EC) No 36/2003 of 14 April 2003 adopted by the Council, acting in accordance with the procedure referred to in Article 251 of the Treaty establishing the European Community, with a view to adopting a regulation of the European Parliament and of the Council relating to fertilisers (Text with EEA relevance).

⁵ **Directive 2003/105/CE** on the European Parliament and of the Council of 16 December 2003 amending Council Directive 96/82/EC on the control of major-accident hazards involving dangerous substances.

Directive 2006/21/EC on the management of waste from the extractive industries (the mining waste directive): may be a relevant framework for measures relating to those waste management facilities which present an accident risk but which are not covered by the above directive. The scope of this directive covers waste from all sectors of the extractive industry and focuses on the operational issues connected with waste management, prevention of soil and water pollution and the stability of waste management facilities (especially tailings lagoons).

A reference document on Best Available Techniques for the “Management of Tailing and Waste-rock in mining Activities” (European Commission, 2009), has been published, in which cadmium is considered among other metals.

2.7 Other relevant legislation and activities

Directive 2004/107/EC of 15 December 2004 relates to arsenic, cadmium, mercury, nickel and polycyclic aromatic hydrocarbons in ambient air.

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: the Directive considers different quality standards values depending on water hardness classes.

Commission Regulation (EC) 552/2009 of 22 June 2009 amending Regulation 1907/2006 on the Registration, Evaluation, Authorisation and Restriction of Chemicals (REACH) as regards Annex XVII: this regulation establishes the restriction of cadmium:

- as colouring agent in several articles, mixtures and paints;
- as stabilizing agent in some mixtures and articles from vinyl chloride;
- for plating metallic articles or components of the articles used in several sectors/applications.

Currently, the European Commission (EC) is considering amending this entry on restrictions for cadmium and its compounds under Annex XVII of the REACH Regulation, with regard to the use of cadmium in jewelry, brazing sticks and PVC. The EC is expected to come forward with a proposal by the end of May 2010.

2.8 Other international bodies:

The ongoing activities on heavy metals in the **UNEP** framework should also be taken into account.

Currently there is a period for the interim review of scientific information on cadmium. The draft final reviews of scientific information on lead and cadmium (November 2008), together with their relevant companion documents, will be amended to include the new information and circulated to the members of the Lead and Cadmium Working Group during the second quarter of 2010 for final comments.

A letter from the Executive Director of UNEP of 26 March 2009, highlighted the main points of Governing Council Decision 25/5 on chemicals management. The letter addresses section II of the Governing Council decision which notes that further action is needed to address the challenges posed by lead and cadmium. Paragraph 12 of the decision *“Encourages efforts by Governments and others to reduce risks to human health and the environment of lead and cadmium throughout the whole life cycle of those substances and to take action to promote the use of lead- and cadmium-free alternatives, where appropriate, for instance in toys and paint as some products containing lead may cause a risk through normal use.”*

As previously indicated, this process should have the support of the OSPAR Contracting Parties.

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

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