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MEDITERRANEAN ACTION PLAN

Joint Meeting of the Scientific and Technical
Committee and the Socio-Economic Committee

Athens, 6-11 May 1991

AIRBORNE POLLUTION OF THE MEDITERRANEAN SEA FROM LAND-BASED SOURCES

Annex IV to the Protocol for the Protection of the
Mediterranean Sea against Pollution from Land-Based Sources

In co-operation with



WMO



WHO

BACKGROUND

It is recognized that a significant fraction of the pollutant load entering the Mediterranean Sea is transported from land-based sources via the atmosphere. Airborne pollutants of major concern include heavy metals and metalloids, chlorinated and petroleum hydrocarbons, and radionuclides.

Atmospheric transport modelling suggests that the emission sources for some pollutants are quite distant, while coastal areas are also affected from local sources. Thus the Gulf of Lion and the Gulf of Genoa, the northern Adriatic Sea and the Aegean Sea are likely to be the most affected areas by the long-range transport of Cd from the major sources in Europe while high concentrations of Cd in the south of Italy, near Naples, Trieste and Piombino are attributed to local industrial sources.

The available data on metals demonstrate that the levels of atmospheric pollution over the Mediterranean are comparable to those over other European regional seas. In the Western Mediterranean the levels are 0.8-2.0 ng/m³ for Cd, 20-40 ng/m³ for Pb, 26 ng/m³ for Zn, 10 ng/m³ for V, 180-260 ng/m³ for Fe, 2.5-3.2 ng/m³ for Cu and about 350 ng/m³ for Al. Air pollution is especially high over densely populated coastal areas where Pb and Cd concentrations were reported as 171-305 ng/m³ and 4.5-5.9 ng/m³ correspondingly.

The few available data on organic substances in Mediterranean air indicate that concentrations of PCBs (0.04-0.3 ng/m³) are lower than, for example, in the North Sea and comparable with open ocean regions. By contrast, concentrations of n-alkanes, both in particulate (10.8-43.7 ng/m³) and in vapour (65-147 ng/m³) phases, are substantially higher. The total atmospheric fluxes of PCBs and hexachlorocyclohexanes (HCHs) into the Mediterranean Sea were estimated as 1.7 and 9.9 t/yr; for the World Ocean the atmospheric inputs of these synthetic organic compounds make up correspondingly 80 and 99 per cent of the total (atmospheric and riverine) inputs.

The total annual deposition fluxes of metals to the western Mediterranean basin were calculated in tons as follows: Cd-500; Pb-14,500; V-12,500; Zn-17,000; Cu-2,100, and constitute correspondingly 18.5, 11.8, 3.6, 21.0 and 11.1 per cent of their total European emissions (The Atmospheric Input of Trace Species to the World Oceans, GESAMP Reports and Studies No. 38). The mineral aerosol fluxes over the eastern Mediterranean are at least 5 times higher than those over the western part whilst the pollutant element fluxes are lower. The total deposition calculated for sulphur is also essential, amounting to 300,000 tons per year with 8 per cent coming from France, 29 per cent from Italy and 22 per cent from Spain.

The flux estimates made by the World Meteorological Organization on the basis of the most recent studies show that the atmospheric input into the Mediterranean Sea is for some elements or compounds at least comparable in magnitude to riverine inputs.

A WMO/UNEP Workshop on Airborne Pollution of the Mediterranean Sea was convened in November 1987 to discuss preliminary results of a pilot project on studying air pollutant deposition and pollutant concentrations in air in the Mediterranean, launched in 1986, as well as the relevant research activities on pollutant-transfer processes at air/sea interface co-ordinated by the World Meteorological Organization within the framework of the Long-term Programme of Pollution Monitoring and Research in the Mediterranean Sea (MED POL Phase II). The workshop also agreed on detailed proposals for an airborne pollution monitoring and modelling programme to be implemented within the framework of national monitoring agreements. A summary report of the workshop including the programme proposals as well as scientific papers presented at the Workshop and an overview of airborne pollution over the Mediterranean, which summarizes the present knowledge and reviews ongoing activities in the region, were published in 1989 as MAP Technical Reports Series No. 31.

The monitoring programme was subsequently adopted by the First Meeting of the Scientific and Technical Committee of the Barcelona Convention (Athens, May 1988) and its implementation started in 1989.

INTRODUCTION

The Convention for the Protection of the Mediterranean Sea against Pollution (Barcelona Convention) was adopted on 16 February 1976 in Barcelona, Spain, came into force on 12 February 1978 and by the end of 1990, has been ratified by all 18 Mediterranean countries and the EEC.

Article 8 of the Convention states:

"The Contracting Parties shall take all appropriate measures to prevent, abate and combat pollution of the Mediterranean Sea Area caused by discharges from rivers, coastal establishments or outfalls, or emanating from any other land-based sources within their territories."

In order to implement the provisions of article 8, the Contracting Parties to the Barcelona Convention adopted on 17 May 1980 in Athens the Protocol for the Protection of the Mediterranean Sea against Pollution from Land-Based Sources (LBS Protocol) which came into force on 17 June 1983 and, by the end of 1990, has been ratified by 16 Contracting Parties to the Barcelona Convention.

Article 4 (para 1b) of the Protocol states:

"This Protocol shall apply to pollution from land-based sources transported by the atmosphere, under conditions to be defined in an additional annex to this Protocol and accepted by the Parties in conformity with the provisions of article 17 of the Convention".

To assist the Contracting Parties to the Protocol in developing such an annex, the United Nations Environment Programme and the World Meteorological Organization organized an Ad Hoc meeting (Athens, 19-21 December 1988) on the preparation of a draft of this annex, which would become Annex IV to the LBS Protocol.

The report of the Ad Hoc meeting (UNEP(OCA)/MED WG.6/1) was sent in January 1989 to all the Contracting Parties for comments. In October 1989 the Sixth Ordinary Meeting of the Contracting Parties to the Barcelona Convention approved the development of Annex IV to the LBS Protocol in the programme budget for 1990-1991 (UNEP(OCA)/MED IG.1/5, Annex VI, page 7).

The first draft Annex IV to the LBS Protocol was prepared by a consultant on the basis of the conclusions made by the above-mentioned Ad Hoc meeting and taking into account comments made by WMO and the Co-ordinating Unit for the Mediterranean Action Plan.

After discussing the draft, the Joint Meeting of the Scientific and Technical Committee and the Socio-Economic Committee (Athens, 26 May - 1 June 1990) agreed that Contracting Parties would send to the Co-ordinating Unit detailed comments on the technical and legal aspects of the Annex by September 1990. A revised text of Annex IV would then be prepared and transmitted to Contracting Parties and later be submitted to the 1991 Joint Committees Meeting for approval (UNEP(OCA)/MED WG.12/6, para 49).

In accordance with the above, the present revised text has been prepared by WMO, WHO and UNEP on the basis of comments submitted by Contracting Parties.

The Joint Meeting of the Scientific and Technical Committee and the Socio-Economic Committee (Athens, 6-11 May 1991) is invited to consider this document. On the basis of further comments given at the Joint Meeting, a final draft will be prepared for submission to the Seventh Ordinary Meeting of the Contracting Parties to the Convention for the Protection of the Mediterranean Sea against Pollution and its Related Protocols (Cairo, 8-11 October 1991) with a view to its adoption. A draft workplan for the implementation of the terms of the Annex following adoption is similarly submitted to the Joint Committees Meeting.

**Revised text prepared by WMO, WHO and UNEP on the basis
of comments submitted by the Contracting Parties**

ANNEX IV

This annex defines the conditions of application of this Protocol to pollution from land-based sources transported by the atmosphere in terms of Article 4.1(b) of this Protocol.

1. This Protocol shall apply to polluting discharges into the atmosphere under the following conditions:
 - (a) the discharged substance is capable of being transported to the Protocol Area under prevailing meteorological conditions;
 - (b) The input of the substance into the Protocol Area or its subregions is significant, in terms of environmental impact, relative to the quantities of the same substance reaching the Area by other means.
2. This Protocol shall also apply to polluting discharges into the atmosphere affecting the Protocol Area from land-based sources within the territories of the parties, from fixed man-made offshore structures, subject to the provision of Article 4.2 of this Protocol.
3. In the case of pollution of the Protocol Area from land-based sources through the atmosphere, the provisions of Articles 5 and 6 to this Protocol shall apply progressively to appropriate substances and sources listed in Annexes I and II to this Protocol as will be agreed by the Parties.
4. Subject to the conditions specified in paragraph 1 of this annex, the provisions of Article 7.1 of this Protocol shall also apply to:
 - (a) location and distribution of air pollution sources and quantity of substances emitted to the atmosphere and the rate of such emissions;
 - (b) the content of harmful substances in fuel and raw materials;
 - (c) the efficiency of air pollution control technologies and more efficient manufacturing and fuel burning processes;
 - (d) land use practices and application of harmful substances in agriculture and forestry.
5. The provisions of Annex III to this Protocol shall apply to pollution through the atmosphere whenever appropriate. Air pollution monitoring and modelling using acceptable common emission factors and methodologies, shall be carried out in the assessment of atmospheric deposition of substances, as well as in the compilation of inventories of quantities and rates of pollutant emissions into the atmosphere from land-based sources.
6. All Articles, including parts thereof to this Protocol not mentioned in paragraphs 1 to 5 above shall apply equally to pollution from land-based sources transported by the atmosphere wherever applicable and subject to the conditions specified in paragraph 1 to this Annex.

**WORKPLAN FOR THE IMPLEMENTATION OF ANNEX IV
TO THE LBS PROTOCOL DURING 1992-1993**

<u>Actions</u>	<u>Target date</u>
1. Compilation of a Mediterranean emission inventory of heavy metals (starting with Cd and Pb)	Dec. 1992
2. Compilation of a Mediterranean emission inventories for acidifying compounds	Dec. 1992
3. Assessment of airborne pollution of the Mediterranean Sea (primarily by heavy metals and acidifying compounds)	Dec. 1993

**PRELIMINARY WORKPLAN FOR THE IMPLEMENTATION OF
ANNEX IV TO THE LBS PROTOCOL DURING 1994-1995**

<u>Actions</u>	<u>Target date</u>
1. Establishment of an expert group on airborne pollution of the Mediterranean Sea	March 1994
2. Compilation of information on existing legislative measures regarding the control of emissions of harmful substances into the atmosphere from various groups of sources	Sept. 1994
3. Initiation of collection and dissemination of information on existing air pollution control technologies (starting with heavy metals and acidifying compounds)	Sept. 1994
4. Identification and categorization of the most important groups of emission sources (starting with heavy metals) and preparation of general recommendations for control	Dec. 1994
5. Preparation of guidelines for inventory of emissions of other important pollutants (e.g. organic species)	March 1995
6. Reconsideration of the most important problems with regard to airborne pollution of the Mediterranean Sea and preparation of a plan for future actions	March 1995