



United Nations
Environment
Programme



UNEP(OCA)/MED WG.12/5
5 April 1990

Original: ENGLISH

MEDITERRANEAN ACTION PLAN

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

Athens, 28 May - 1 June 1990

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



U N E P
Athens, 1990

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, e.g. in Monaco and Marseilles 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 (GESAMP, 1989. 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 and also 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 1989, has been ratified by 17 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 1989, has been ratified by 12 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. The report was also mentioned in the Progress Report on the Implementation of the Mediterranean Action Plan during 1988/1989 (UNEP(OCA)/MED WG.3/Inf.3) submitted to the First Joint Meeting of the Scientific and Technical Committee and the Socio-Economic Committee (Athens, 26-30 June 1989). 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 present 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.

The Joint Meeting of the Scientific and Technical Committee and the Socio-Economic Committee (Athens, 28 May - 1 June 1990) is invited to consider this document. On the basis of 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.

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 affecting the Protocol area from land-based sources within the territories of the Parties, in particular those falling in the following categories :

- (a) Energy production
- (b) Industry
- (c) Transportation
- (d) Incineration.

2. This Protocol shall also apply to polluting discharges into the atmosphere from vessels and 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 Article 5 of this Protocol shall apply to the following substances listed in Annex I to this Protocol:

- (a) Organohalogen compounds and substances which may form such compounds in the marine environment (item 1)
- (b) Organophosphorus compounds and substances which may form such compounds in the marine environment (item 2)
- (c) Mercury and mercury compounds (item 4)
- (d) Cadmium and cadmium compounds (item 5)
- (e) Substances having proven carcinogenic, teratogenic or mutagenic properties in or through the marine environment (item 8)
- (f) Radioactive substances, including their wastes, when their discharges do not comply with the principles of radiation protection as defined by the competent international organizations, taking into account the protection of the marine environment (item 9).

4. In the case of pollution of the Protocol area from land-based sources through the atmosphere, the provisions of Article 6 of this Protocol shall apply to the following substances listed in Annex II to this Protocol:

- (a) The following elements and their compounds:
 - (i) Zinc (item 1.1)
 - (ii) Copper (item 1.2)
 - (iii) Nickel (item 1.3)
 - (iv) Lead (item 1.5)
 - (v) Vanadium (item 1.16).
- (b) Crude oils and hydrocarbons of any origin (item 4)
- (c) Inorganic compounds of phosphorus and elemental phosphorus (item 7)
- (d) Substances which have, directly or indirectly, an adverse effect on the oxygen content of the marine environment, especially those which may cause eutrophication (item 11)
- (e) Substances which, though of a non-toxic nature, may become harmful to the marine environment or may interfere with any legitimate use of the sea due to the quantities in which they are discharged (item 13).

5. The provisions of Article 7.1 of this Protocol shall also apply to:

- (a) height and location of chimneys, taking into account, in particular, the methods used for treating air pollutant emissions, and the local atmospheric dispersion regimes
- (b) the lead content in gasoline
- (c) the efficiency of particulate matter filters in coal-fired power plants.

6. The provisions of Annex III to this Protocol shall apply to pollution through the atmosphere wherever appropriate. In the assessment of atmospheric deposition of substances, air pollution monitoring and modelling, as well as inventories of quantities and rates of pollutant emissions into the atmosphere from land-based sources, using acceptable common emission factors and methodologies shall be carried out.

7. All Articles, including parts thereof to this Protocol not mentioned in paragraph 1 to 6 above shall apply equally to pollution from land-based sources transported by the atmosphere wherever applicable.