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MONITORING OF LAND-BASED SOURCES OF MARINE POLLUTION IN THE MEDITERRANEAN

Report on a Joint WHO/UNEP Consultation

Split
1-5 December 1987

1988

EUR/HFA target 20

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TARGET 20

Water pollution

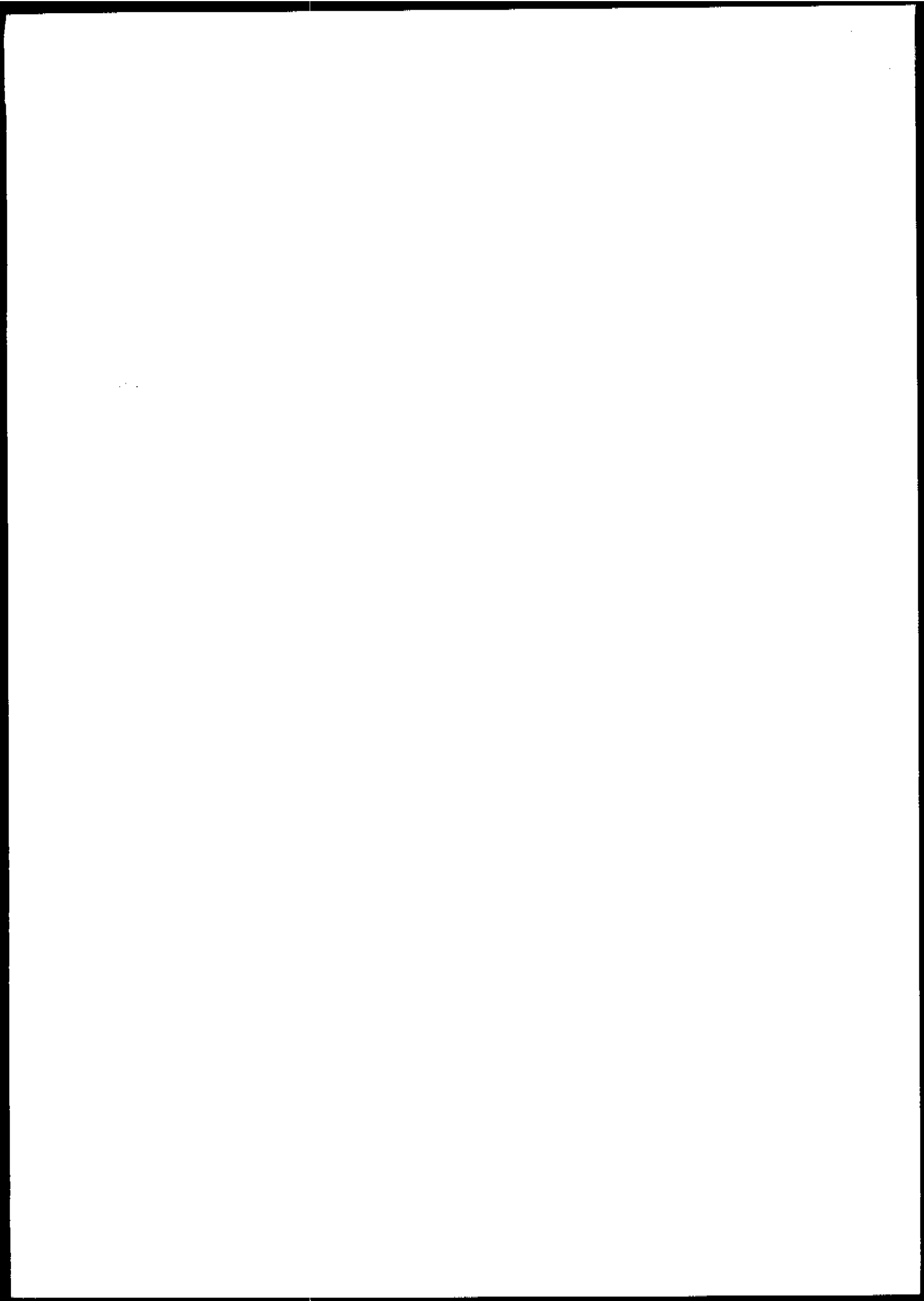
By 1990, all people of the Region should have adequate supplies of safe drinking-water, and by the year 1995 pollution of rivers, lakes and seas should no longer pose a threat to human health.

Index:

ENVIRONMENTAL MONITORING
WATER POLLUTION %PCZ
LEGISLATION
MEDITERRANEAN

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FOREWORD

It is estimated that approximately 80% of the total pollution load of the Mediterranean Sea originates from land-based sources, and a preliminary assessment of the overall situation was carried out in 1977 within the framework of the Joint Coordinated Programme of Mediterranean Pollution Monitoring and Research (MED POL Phase I), operational between 1975 and 1981.

Under the terms of the Protocol for the Protection of the Mediterranean Sea against Pollution from Land-based Sources, adopted and signed in Athens in May 1980, Contracting Parties have to carry out monitoring activities in order to (a) systematically assess, as far as possible, the levels of pollution along their coasts, in particular with regard to the substances or sources listed in Annexes I and II to the Protocol, and periodically to provide information in this respect, and (b) to evaluate the effects of measures carried out under the Protocol to reduce pollution of the marine environment.

The monitoring component of the Long-term Programme of Pollution Monitoring and Research in the Mediterranean Sea (MED POL Phase II), approved by the governments of the Region in Cannes in March 1981 and designed to cover the period 1981-1990, includes the monitoring of sources of pollution to provide information on the type and amount of pollutants reaching the marine environment from coastal sources. This part of the monitoring component of MED POL Phase II is the technical responsibility of WHO, and several countries are now performing such work within the framework of overall national MED POL monitoring programmes signed between the relevant national authorities and the United Nations Environment Programme (UNEP) in its capacity as the Secretariat to the 1976 Convention for the Protection of the Mediterranean Sea against Pollution and its related Protocols, and as the Coordinating Agency for the Mediterranean Action Plan.

Monitoring of pollution sources requires more organization than other components of the programme, principally because it represents a relatively new activity for several countries of the region and, in view of their participation in this component, it is necessary to consolidate matters from both the organizational and technical viewpoints.

The objectives of the present meeting, which was being convened jointly by WHO and UNEP within the framework of the MED POL Phase II programme, included the following:

- to review the status of pollution source monitoring in the region, particularly within the framework of MED POL Phase II, and to formulate a general approach to such monitoring in relation to preventive and remedial action;
- to review national legislation regarding land-based marine pollution, including criteria and standards for effluent quality;
- to review the questionnaires for the new survey of pollutants from land-based sources in the Mediterranean;
- to discuss national requirements for land-based pollution monitoring;
- to make appropriate recommendations.

A number of experts from Mediterranean countries who were engaged either in the organization or actual implementation of monitoring land-based sources of marine pollution (within the framework of the MED POL Phase II programme or otherwise), or in the technical and/or administrative aspects of development and enforcement of relevant legislation in their own country, were invited to attend the Consultation. In addition, the following international organizations were invited to send representatives: the Food and Agriculture Organization of the United Nations, the United Nations Educational, Scientific and Cultural Organization, the Intergovernmental Oceanographic Commission, the World Meteorological Organization, the International Atomic Energy Agency and the Commission of European Communities (CEC).

1. Opening of the meeting (agenda item 1)

The meeting took place in the offices of the UNEP Regional Activity Centre for the Priority Actions Programme (PAP/RAC) of the Mediterranean Action Plan, Split, from 1 to 5 December 1987. It was attended by 19 participants from nine Mediterranean countries, one representative of UNEP and one staff member of the WHO Regional Office for Europe. A list of participants is given in Annex 3.

Dr L.J. Saliba, Senior Scientist, Mediterranean Action Plan, WHO Regional Office for Europe, opened the meeting and welcomed the participants on behalf of the Regional Director, Dr J.E. Asvall. He briefly outlined the events leading to the meeting and explained its context within the general framework of the Mediterranean Action Plan and, in particular, vis-a-vis the monitoring component of MED POL Phase II.

Dr L. Jeftic, Senior Marine Scientist, UNEP Coordinating Unit for the Mediterranean Action Plan, welcomed the participants on behalf of Dr Mostafa K. Tolba, Executive Director of UNEP, as well as of Mr A. Manos, Coordinator for the Mediterranean Action Plan. He described the programme and calendar of activities approved by the Contracting Parties to the Convention for the Protection of the Mediterranean Sea against Pollution and its related Protocols for the progressive implementation of the Protocol for the Protection of the Mediterranean Sea against Pollution from Land-based Sources. He stressed the importance of the present meeting, which, apart from dealing with several aspects of land-based source monitoring proper, also included in its agenda a number of other matters dealing directly with the implementation of the Protocol.

Dr A. Baric, Coordinator of the priority action on solid and liquid waste management and disposal, UNEP PAP/RAC, also welcomed the participants on behalf of the Director of the Centre, Mr A. Pavasovic. He briefly described activities being undertaken by PAP/RAC in this field, many of which were complementary to those being organized within the framework of MED POL Phase II.

2. Scope and purpose of the meeting (agenda item 2)

Dr L.J. Saliba outlined the scope and purpose of the Consultation. In the Mediterranean region, a number of countries had commenced with the monitoring of a number of chemical and microbiological parameters in municipal and industrial effluents as part of their national marine pollution monitoring programmes being undertaken within the framework of MED POL Phase II. Some

other countries were undertaking similar work within the framework of their own national legislative framework for the prevention and control of marine pollution or in compliance with EEC directives. It was necessary to review relevant monitoring work being carried out under MED POL with a view to its further enhancement and coordination. In this regard, while general guidelines existed for health-related monitoring of coastal recreational and shellfish-growing waters, supported by detailed reference methods for determination of the major microbiological and related parameters therein, no equivalent for land-based pollution source monitoring had been developed so far. Such a document had now become necessary, and its outline and content would have to be discussed and agreed to by the present meeting.

A new survey of pollutants from land-based sources in the Mediterranean Sea was planned to commence in 1988, and the draft questionnaires prepared would have to be reviewed and amended, if necessary, prior to transmission of the final drafts to national MED POL coordinators. In addition, the compendium on current legislation in Mediterranean countries on prevention and control of marine pollution from land-based sources required updating, and it was hoped that the participants could provide a further contribution through information on the present status of national legislation on the subject.

3. Election of Officers (agenda item 3)

Dr Athena Mourmouris was elected Chairman, Professor K. Curi Vice-Chairman and Mr V. Gauci Rapporteur. Dr L.J. Saliba acted as Secretary to the meeting.

4. Adoption of the agenda (agenda item 4)

The provisional agenda was unanimously adopted.

5. Organization of the meeting (agenda item 5)

The Chairman explained the detailed organization of the work of the meeting, including session hours and other arrangements. The provisional programme was adopted by the meeting, subject to any changes considered necessary from time to time. It was agreed that all sessions would be held in plenary, with the proviso that ad hoc working or drafting groups could be established, if necessary, to work on specific items.

6. General approach to pollution-source monitoring in relation to preventive and remedial action (agenda item 6)

The meeting discussed document ICP/CEH 044/6 on elements of a general approach to the monitoring of land-based pollution sources in relation to preventive and remedial action. In defining land-based pollution sources, the meeting considered the terms of Article 4 of the Protocol for the Protection of the Mediterranean Sea against Pollution from Land-based Sources, which lays down that the Protocol currently applies to polluting discharges reaching the Protocol area from land-based sources within the territories of the Parties, in particular directly from outfalls discharging into the sea or through coastal disposal and indirectly through rivers, canals or other watercourses, including underground watercourses, or through run-off. The same article also included pollution from land-based sources transported by the atmosphere, but this aspect was conditional to the development of an additional annex to the

Protocol. In accordance with current interpretation of the terms of the Protocol by the Working Group on Scientific and Technical Cooperation for MED POL, outfalls discharging directly into the sea, diffuse discharges (also directly into the sea) and estuaries were considered as sources of land-based pollution to be monitored. This, of course, did not preclude any country from taking any control measures considered appropriate in the case of effluents discharged into rivers.

The meeting agreed that, to develop a common basic approach to pollution source monitoring, relevant guidelines were necessary. The outline content of such guidelines was discussed, using as a basis both the material in the meeting document (ICP/CEH 044/6) and its annexed guidelines for monitoring effluents from selected submarine outfalls and affected coastal areas. This latter had been agreed on by institutions participating in an ad hoc exercise on the monitoring of the efficiency of five selected outfall structures in the Mediterranean, which had commenced in mid-1986 but had not been completed so far.

In general, it was considered that the proposed guidelines should specify the mode of approach, emphasize preventive and control measures, and stress the need for the development of appropriate national, regional and local organization in monitoring. The guidelines should also identify the types of land-based sources of pollution to be monitored, explain sampling procedures (including frequency of sampling), specify the various parameters to be monitored, and define appropriate confidence limits.

It was agreed that the section of the guidelines dealing with general philosophy and approach should include appropriate refined flow charts clearly indicating the role of pollution source monitoring within the overall framework of marine pollution prevention and control programmes. It was also emphasized that the monitoring programme itself should have an interactive approach to enable continuous or periodic readjustment in the light of experience acquired.

The meeting considered that the pollution load discharged into the marine environment should preferably be calculated from concentration/flow determinations. In the case of diffuse sources of pollution, three approaches were mentioned as possibilities:

- determination of the concentrations of selected pollutants in various parts of the receiving marine environment in combination with salinity measurements, extrapolating to zero salinity, and flow estimations;
- utilization of information obtained from similar situations, in which accurate load calculations were available or could be made;
- calculation of population equivalents.

In the case of sampling, the taking of composite (automatically or by hand) or random (grab) samples would depend on the particular parameter being measured. The latter method might be preferable in the case of certain parameters, such as trace metals and organics, to avoid possible contamination or change in the composition of the samples. Prior to determining the number of samples to be taken in a full period, a decision was necessary regarding the percentage reliability of results required.

The meeting agreed on the final version of the outline contents of the proposed guidelines, which are reproduced in Annex 1.

7. Review of the status of pollution-source monitoring within the framework of MED POL Phase II (agenda item 7)

The meeting discussed document ICP/CEH 044/7 on the status of the pollution source monitoring component within the framework of MED POL Phase II. In the selection of sources of pollutants to be monitored within the framework of national monitoring programmes by agreements signed between the Coordinating Unit for the Mediterranean Action Plan on the one hand and by the national MED POL coordinator (on behalf of the relevant country authorities) on the other, the identification of pollution sources included all discharges of pollutants from land-based sources, in particular from outfalls discharging into the sea or through coastal disposal, and from fixed man-made offshore structures under national jurisdiction serving purposes other than exploration and exploitation of the continental shelf, the sea bed and its subsoil. More specifically, apart from waste dumped under special and general permits, the sources to be monitored included (a) effluents of specified industries, and (b) outlets of specified urban agglomerations. In each case, the selection of sites to be monitored was decided on by the national authorities of the country concerned.

The parameters to be determined in effluents (as and where appropriate), as decided by the Contracting Parties to the 1976 Barcelona Convention during their Second Ordinary Meeting in Cannes in 1981 (where the MED POL Phase II programme was approved), were as follows.

Priority parameters

- Total mercury (Hg)
- Total cadmium (Cd)
- Petroleum hydrocarbons (PH)

Other parameters

- High molecular weight chlorinated hydrocarbons (HH)
- Biochemical oxygen demand (BOD₅)
- Chemical oxygen demand (COD)
- Total suspended solids (TSS)
- Total phosphorus (P)
- Total nitrogen (N)
- Faecal coliforms (FC)
- Detergents (anionic) (DET)
- Phenols (index) (PHE)
- Total lead (Pb)
- Total chromium (Cr)
- Total zinc (Zn)
- Selected radionuclides (RAD)

Eight Mediterranean countries (Algeria, Cyprus, Egypt, Libya, Malta, Morocco, Syria and Yugoslavia) had national monitoring programmes formally signed with the Coordinating Unit for the Mediterranean Action Plan, which included a pollution source monitoring component. Thirty institutions from these countries were engaged in this work, covering 67 sampling stations for

municipal effluents and 56 for industrial effluents. In some stations, all the 16 listed parameters were being covered. A number of national programmes had been ongoing for four years; others were still new. A list of countries giving the number of institutions and sampling stations, together with parameters covered, is given in Annex 2.

Apart from the countries mentioned above, Greece and Turkey had submitted national MED POL monitoring programmes, both of which included a pollution source monitoring component. These two programmes, however, had not yet been finalized. Two other countries (Israel and Lebanon) had operational programmes within the framework of MED POL Phase II, but these did not so far include a pollution source monitoring component.

Practically all the other countries in the region still having their marine pollution monitoring programme outside MED POL proper were regularly monitoring pollution sources.

It was recognized that, up to the present time, no standardized methodology for effluent analysis had been developed specifically for the MED POL programme. This problem, however, was more apparent than real in the sense that most of the methods developed for the programme's other components (determination of microbiological and chemical parameters in seawater, marine biota and sediments) could be applied equally well to the same parameters in effluents with only relatively minor modifications in the analytical processes themselves. The problem of sampling methodology, however, still had to be finalized, and this could be taken care of in the proposed guidelines discussed in part 6 above.

The participants were informed that, following a small ad hoc consultation to review the MED POL monitoring component, the Working Group on Scientific and Technical Cooperation for MED POL agreed on a revised set of parameters to be monitored for effluents, which were divided into two categories, the first to be included in national MED POL monitoring programmes and the second to be included in both MED POL and other national monitoring programmes whenever necessary and applicable. The parameters recommended were as follows.

Category I parameters

- Volume and characteristics of discharge (e.g. pH, temperature, general composition)
- Total mercury
- Total cadmium
- Total suspended solids
- Total phosphorus
- Total nitrogen
- Faecal coliforms
- BOD/COD
- High molecular weight halogenated hydrocarbons

Category II parameters

- Petroleum hydrocarbons
- Detergents
- Phenols

- Total chromium
- Selected radionuclides
- Other pollutants known to be discharged in significant quantities

It was also recommended by the Working Group that, for obvious reasons, in the specific case of industrial effluents, the parameters listed above and/or other parameters should be selected in accordance with the specific composition of the wastewater discharged.

These recommendations, as outlined above, were approved by the Contracting Parties at their Fifth Ordinary Meeting in Athens in September 1987. The pollution source component of MED POL monitoring programmes would therefore have to reflect these revised parameters as from 1988.

It was agreed by the meeting that the proposed guidelines for monitoring land-based pollution sources (see section 6 above) should necessarily have to take these revised parameters into account, although, as the guidelines would not be binding, any other parameter considered to be of importance could also be recommended.

8. Review of national legislation regarding land-based marine pollution, including criteria and standards for effluent quality (agenda item 8)

As part of the preparatory work for the Protocol for the Protection of the Mediterranean Sea against Pollution from Land-based Sources, WHO and UNEP jointly published a survey of relevant legislation in Mediterranean countries in 1976. In view of the fact that several countries, in keeping with the trend of orienting the approach towards marine pollution control legislation from the fragmentary to the comprehensive, were either amending existing laws and related statutory provisions or promulgating new ones, it was decided to amend the 1976 publication. A provisional supplement containing major national legislative developments during the period 1976-1983 and reported in WHO's International digest of health legislation was prepared in 1985. This, however, was not published pending the compilation of more up-to-date and comprehensive material.

A number of participants described the various developments in the promulgation of national marine pollution control legislation (with particular emphasis on land-based pollution) in their respective countries. In Spain during the last decade, a ministry order of 29 April 1977 contained instructions for discharge into the sea of wastewater from land-based sources by means of submarine outfalls. The objectives of this were to establish limit values for quality parameters in the receiving waters, taking their eventual use into account, and to establish the technical requirements of the design, construction and management of submarine outfalls. A law of 10 March 1980 on the protection of Spanish coasts complemented the previous (1969) law (which defined public marine areas), detailing types of infringement and the corresponding penalties. A comprehensive law on waters was promulgated on 2 August 1985. This concerned surface water and groundwater, and therefore explicit provisions for the protection of coastal waters were not included. However, the law did regulate discharges into rivers that could eventually pollute the sea. A royal decree of 4 April 1986 approved the regulations passed under this law. These included detailed lists of pollutants that were identical to Annexes I and II of the Mediterranean Land-based Pollution Protocol.

In Yugoslavia, federal legislation included a law concerning the basic regulations regarding waters affecting two or more republics or autonomous regions and of international waters (1974, 1976), regulations on the classification of waters of inter-republic river flows, international waters, and national coastal waters (1978), and regulations concerning maximum concentrations of radionuclides and harmful substances in inter-republic waters, international waters and national coastal waters (1978). Six laws and regulations on water quality, including disposal and reuse of waste, were passed by the Socialist Republic of Bosnia and Herzegovina between 1967 and 1981 and eight by the Socialist Republic of Croatia between 1980 and 1984, including regulations concerning maximum permitted concentrations of harmful substances in fresh and marine coastal waters and guidelines regarding preparation of environmental impact assessment studies. The Socialist Republic of Montenegro passed five laws and regulations of a similar type between 1968 and 1981, and the Socialist Republic of Slovenia five laws, including guidelines concerning harmful substances in, and permitted temperatures of, waters between 1978 and 1985.

Recent legislation in Morocco included a decree of 12 May 1980 on the reorganization of the agencies responsible for environmental protection and improvement and regulations promulgated on 19 March 1984 concerning the use of organochlorine pesticides.

In France, collection, disposal and discharge of solid and liquid waste along the country's Mediterranean coastline was subject to national legislation. In the case of land-based discharges, legislation considered primarily fresh waters, and, by extension, also marine waters. The basic law of 16 December 1964 was supplemented by numerous regulations concerning construction permits, public health, industrial installations, etc. The discharge and treatment of municipal wastewaters were the responsibility of the communes, and all discharges were subject to authorization, which was not granted unless effected after appropriate treatment equivalent to at least primary treatment, ensuring that sensitive areas are not affected. Standards for recreational and shellfish waters were based on the EEC directives of 1975 and 1979 respectively. The relative national legal texts were supplemented by technical guidelines issued by the Ministry of Environment in 1983, which provided general orientations for determining the level of quality of discharge and the type of treatment to adopt in relation to the coastal area concerned. The guidelines also referred to maximum permissible levels of a number of pollutants.

Industrial wastewaters were subject to the provisions of Law No. 76-663 of 1976, which classified industrial installations with a view to environment protection. Apart from general considerations, industries were also treated on a case-by-case basis for authorization purposes. In addition, there were numerous regulations concerning waste either from specific industries or regarding specific pollutants, a number of them again based on the relevant EEC directives. Among the more recent ones were that of 6 December 1985 regarding the reduction of cadmium-containing waste in water and that of 26 September 1986, regulating electroplating industries.

Greek legislation included the sanitary regulations of 22 January 1965 on the disposal of sewage and industrial waste. These regulations provided prefectures with the authority to define specific water quality and emission standards for specific branches or production units. Law No. 1180 of

October 1981 on the establishment and operation of industries, factories, etc., and the protection of their environment included compulsory environmental impact assessment, treatment requirements and emission standards. A ministerial decision of July 1986 on the quality of surface waters intended for drinking-water, bathing waters, and aquaculture and shellfish waters referred to quality criteria, methods of analysis and frequency of sampling. A framework law on the protection of the environment passed in September 1986 covered all aspects of environmental preservation and also initiated the polluter pays principle.

In addition to national legislation, a number of prefectural decisions, laying down quality criteria for specific marine areas and standards and criteria for sewage and industrial waste, were enforced between 1977 and 1986.

In Malta, the legislative framework had not significantly altered, as standing laws and regulations provided the means of enforcing control according to circumstances. Sewage pollution was controlled by public health regulations. Control over waste was at two levels. A number of chemicals were prohibited for importation, which constituted the first level of control. The second level, taking care of discharges, consisted in the establishment of operating conditions for every industry as a prerequisite for licensing, including type and amount of waste discharged and treatment required. Under the industrial establishment ordinance of 1986, the discharge or disposal of any industrial waste was subject to complete control by the health authorities, who determined maximum concentrations of chemicals and amounts of waste, method and degree of treatment, certification and site and method of disposal.

The meeting reviewed the legislative position on the basis of the country presentations outlined above, as well as for other countries as described in the first update to the 1976 publication (document ICP/CEH 044/8 on the synthesis of major legislation on control of marine pollution from land-based sources recently enacted in Mediterranean countries). Differences both in overall approach and in technical detail, between the various countries, were noted. It was realised, however, that there was a practical limit to standardization, and countries had to follow their own systems. On the whole, however, the legislative position had improved substantially in practically all the countries of the region during the last decade.

The meeting noted that, on the basis of the information provided, as well as on other material recently made available to the Secretariat, work would start during the first quarter of 1988 on the updating of the 1976 document.

9. Survey of pollutants from land-based sources in the Mediterranean
(agenda item 9)

A pilot project on pollutants from land-based sources in the Mediterranean (MED POL X) was implemented between 1976 and 1977 within the framework of MED POL Phase I. The scope, which was that of providing a technical input into the preparatory work for the Protocol for the Protection of the Mediterranean Sea, included the tasks of preparation of an inventory of all major sources of pollutants in coastal areas, assessment of the nature and quantity of selected pollutants entering the Mediterranean from such sources and from major rivers, and a review of current waste disposal and management practices.

A second survey, designed to repeat the 1976-1977 exercise in a modified way and to take account of the experience gained from it, was among the activities recommended by a meeting of experts on the technical implementation of the Protocol (Athens, 9-13 December 1985) as part of a programme calendar of relevant activities to be undertaken. The fourth meeting of the Working Group on Scientific and Technical Cooperation for MED POL (Athens, 16-20 June 1986) endorsed the activity but decided that the questionnaires should only initially cover information on liquid domestic discharges and on cadmium, mercury, organochlorines and petroleum hydrocarbons as industrial pollutants, and should take into account the forms of the Paris convention.

On the basis of the above, draft questionnaires related to (a) liquid domestic discharges, (b) industrial discharges containing mercury, cadmium and organochlorines, and (c) industrial discharges of petroleum hydrocarbons, the last supported by questionnaires on oil discharges from reception facilities and from refineries, had been prepared. These questionnaires had been based either on the 1976 documentation, with modifications arising out of experience gained during that survey, or on formats utilized for similar surveys for the Helsinki and/or Paris conventions.

The meeting comprehensively discussed the draft questionnaires. Several modifications were made, and it was agreed that these modifications would be incorporated in revised versions, which would be submitted to national MED POL coordinators for formal comments. It was also agreed that national MED POL coordinators should be requested to consider the advisability of expanding the list of parameters previously agreed on, to minimize practical and technical problems where different pollutants were discharged concurrently and to prevent the duplication of effort that would arise in later surveys. In this regard, it was considered that the questionnaire on industrial pollutants should also include other heavy metals, as well as other appropriate substances from Annexes I and II to the Protocol.

The meeting also noted the draft questionnaire for a data acquisition system for pollution management (document ICP/CEH 044/10), which had originally been prepared for the survey but later postponed to a long-term activity status rather than an immediate one. In view of the comprehensive nature of this document and the fact that it was not intended for immediate use, the meeting decided that detailed discussion on it should be postponed to the next appropriate consultation to be convened.

10. Review of national requirements for monitoring of land-based sources of marine pollution and related activities

The requirements for the further development of marine pollution monitoring programmes in the region had been reviewed during a consultation on health-related aspects of marine pollution control in the Mediterranean, convened by WHO in Copenhagen from 29 June to 3 July 1987. It had been concluded there that, apart from emphasis on manpower training (including individual and group training and the provision of on-the-spot training by appropriate experts), pollution source monitoring also required special consideration, mainly because of the relatively high cost of instrumentation required as compared with microbiological monitoring of coastal waters. In this regard, it had been considered that this problem would have to be solved mainly at country level, including arrangements made to ensure that relevant existing laboratories already possessing the basic infrastructure be used to the fullest extent possible.

During the discussion on requirements, the main problems pinpointed were equipment, manpower and internal organization. Much of the work involved in land-based pollution monitoring was relatively new to many countries, and though in a number of instances the expertise was already present, supporting staff was often lacking or inadequate. In this context, training of personnel assumed major importance. It was also necessary to ensure cohesion between the different laboratories operating at municipal or local level, including standardization of techniques. Major equipment was a problem in many countries, where facilities were often centralized, and now had to be extended to the appropriate laboratories in coastal areas.

It was realized by the meeting that the amount of assistance that could be provided to national laboratories from the MED POL budget could never solve the problem of equipment acquisition. There were, nevertheless, other sources of assistance available, many of which were in constant or regular use by countries of the region. Improved organization of resources (including requests for assistance) at country level would contribute significantly towards alleviation of the situation.

11. Recommendations

The meeting made the following recommendations.

- (1) To enable the construction and updating of a general picture of the situation in the Mediterranean as a whole, the MED POL monitoring programme should be extended to provide adequate geographical coverage, taking better account of the major pollution sources existing within the territories of the Contracting Parties.
- (2) At the present time, when land-based pollution source monitoring in the Mediterranean is becoming operational, the development of a common general approach is essential and should be reflected in appropriate guidelines.
- (3) As many as possible of the major sources of land-based pollution along the Mediterranean coastline itself, as well as along rivers discharging into the Mediterranean Sea, should be identified.
- (4) Harmonization of methodology should be achieved to the greatest extent possible, particularly through the development of standard reference methods, for sampling and analysis, through regular intercalibration exercises, and through meetings and workshops addressing practical technical problems.
- (5) Assistance requested within the framework of MED POL, as well as that potentially available from other sources, should be planned on an integral basis at national level, to achieve optimal cost-effectiveness. Such plans should also aim at the best possible distribution of available national manpower and material resources.
- (6) WHO and UNEP should make all possible efforts to ensure the constant availability of up-to-date material on national legislation on land-based pollution prevention and control in Mediterranean countries. The Coordinating Unit for the Mediterranean Action Plan should explore all possibilities of disseminating such material to interested scientists, particularly technical information such as emission standards and quality criteria.

Annex 1

DRAFT GUIDELINES FOR MONITORING OF LAND-BASED
MARINE POLLUTION SOURCES

Outline contents

1. Introduction and background
2. Scope and objectives of the monitoring programme
3. Philosophy and approach
4. Collection of available information and preliminary survey
5. Types of pollution sources:
 - 5.1 Point sources
 - outfalls (municipal, industrial, mixed)
 - rivers
 - solid waste and sludge disposal and dumping sites
 - major accidents
 - 5.2 Diffuse sources
 - small outfalls
 - run-off (continuous, discontinuous)
 - other sources contributing to airborne pollution
6. Sampling:
 - 6.1 Matrices and locations
 - 6.2 Methodology, including types of sample (e.g. composite, grab) to be taken
 - 6.3 Frequency
7. Parameters:

As determined by the Working Group on Scientific and Technical Cooperation for MED POL, and adopted by the Contracting Parties, but also to include flow-measurements
8. Analytical methodology
 - techniques
 - intercalibration and quality control
9. Data acquisition and evaluation (the latter in terms of any practical action indicated)
10. Programme organization (including necessary administrative structure and technical requirements)

Annex 2

PARTICIPATION BY MEDITERRANEAN INSTITUTIONS IN POLLUTION-SOURCE
MONITORING WITHIN THE FRAMEWORK OF NATIONAL MED POL
MONITORING AGREEMENTS

Algeria

Municipal effluents: 3 sampling stations
Industrial effluents: 5 sampling stations
Parameters covered: BOD, COD, TSS, N, P, Hg, Cr
Number of institutions: 2

Cyprus

Municipal effluents: Nil
Industrial effluents: 14 sampling stations
Parameters covered: BOD, COD, TSS, N, P, PH, Cd, Pb, Cr, Zn, Cu,
HH
Number of institutions: 1

Egypt

Municipal effluents: 5 sampling stations
Industrial effluents: 4 sampling stations
Parameters covered: BOD, COD, TSS, N, P, FC, DET, PHE, PH, Hg,
Cd, Pb, Cr, Zn, HH, RAD
Number of institutions: 3

Libya

Municipal effluents: 9 sampling stations
Industrial effluents: 5 sampling stations
Parameters covered: BOD, COD, TSS, N, P, FC, DET, PHE, PH, Hg,
Cd, Pb, Cr, Zn, HH, RAD
Number of institutions: 3

Malta

Municipal effluents: 4 sampling stations
Industrial effluents: Nil
Parameters covered: BOD, COD, TSS, N, P, FC, DET, PH, Hg, Cd, Pb,
Cr, Zn
Number of institutions: 3

Morocco

Municipal effluents: 17 sampling stations
Industrial effluents: 11 sampling stations
Parameters covered: BOD, COD, TSS, N, P, FC, DET, PHE, PH, Hg
Number of institutions: 4

Syria

Municipal effluents: 9 sampling stations
Industrial effluents: 5 sampling stations
Parameters covered: BOD, COD, TSS, N, P, FC, DET, PHE, PH, Hg,
Cd, Pb, Cr, Zn, HH, RAD
Number of institutions: 3

Yugoslavia

Municipal effluents: 25 sampling stations
Industrial effluents: 10 sampling stations
Parameters covered: BOD, COD, TSS, N, P, FC, DET, PHE, PH, Hg,
Cd, Pb, Cr, Zn, HH, RAD
Number of institutions: 11

Annex 3

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