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MEDITERRANEAN ACTION PLAN

Tenth Ordinary Meeting of the Contracting Parties to the Convention for the Protection of the Mediterranean Sea against Pollution and its Protocols

Tunis, 18-21 November 1997

IDENTIFICATION OF PRIORITY POLLUTION HOT SPOTS AND SENSITIVE AREAS IN THE MEDITERRANEAN

In collaboration with:

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IDENTIFICATION OF PRIORITY POLLUTION HOT SPOTS AND SENSITIVE AREAS IN THE MEDITERRANEAN

1. INTRODUCTION

This report has been prepared in the framework of the development of a Strategic Action Programme for the Mediterranean, as a follow-up to the signing of the Protocol for the Protection of the Mediterranean Sea against Pollution from Land-based Sources and Activities. The activity was funded by a Project Development Facility (PDF) Block B grant of the Global Environment Facility. It is one of a number of reports prepared to support the preparation of a Transboundary Diagnostic Analysis (TDA) of land-based sources of pollution from coastal zones in the Mediterranean. The TDA identifies priority regional actions which are the basis for a Strategic Action Programme (SAP), and national action programmes for the Mediterranean. The results of the TDA are to be presented to a Donors Conference at the end of the project.

In this context, the WHO Office of the Coordinating Unit of MAP, within the framework of the Mediterranean Action Plan and, in particular, within the MED POL Programme, was given the responsibility of carrying out the activities specifically related to the "Identification of priority pollution hot spots and sensitive areas in the Mediterranean".

The report summarises the results of consolidating and analysing country reports prepared by national teams headed by the government-designated national coordinators for the strategic Action Programme in the country. The national teams were supported by consultants whenever necessary. For this purpose adequate questionnaires were prepared, which were reviewed at an informal meeting in Athens during December 1996, dealing with municipal discharges from coastal cities or urban coastal agglomerates with a population above 100,000 inhabitants (taking into consideration the particular situation in each country related to its size) and from main industries discharging directly into the sea. Questionnaires on rivers and water courses discharging into the sea were also prepared so as to enable the information gathered to be included in the appropriate TDA chapter on rivers. Detailed guidelines were also provided, outlining procedures for:-

- identification of pollution hot spots and prioritisation
- evaluation of the impacts of priority pollution hot spots (focusing on transboundary effects)
- identification of sensitive areas
- remedial actions proposed and estimates of investments needed
  The questionnaires are enclosed, as well as a brief outline of the methodology proposed for the analysis (**Annex I**).

The questionnaires and the guidelines were discussed in a preliminary meeting to brief the consultants on the project, the proposed methodology, and the time schedule for implementation of the project. The questionnaires and guidelines were sent to the national focal points and the national coordinators were asked to start collecting as much as possible of the data required, drawing on the help and support of the national inter-ministry working groups, to be established whenever possible to ensure that the views of all relevant

government structures are taken into account[1]. The nominated consultants visited the different countries whenever necessary and worked with national teams on finalizing the country reports. For the estimation of the financial requirement needed to overcome the situation, as described in the National Priority Pollution Hot Spots in Annex II, regarding the nature of investment, the approach mentioned below was followed. If there were already available projects with the exact financial requirement (as was the case for Cyprus, Egypt, Lebanon, etc.), then the indicated amount appeared in the last column of the table. If this was not the case, then an estimation based on similar projects would have given the order of magnitude of the required funds. In most cases this was the way in which the last columns were filled in, in collaboration always when there was involvement by the consultant. Therefore, except in some cases, the estimated amounts of intervention represent the financial requirement as estimated by the countries themselves.

The country reports were next discussed at length and edited during a meeting attended by the national coordinators and the consultants.

Finally the country reports were consolidated by a consultant in a report that has been reviewed by WHO/MAP Coordinating Unit to produce the draft report.

The draft report on Priority Pollution Hot Spots (UNEP(OCA)/MED WG.130/4) was presented to the meeting of Government-designated Experts to examine a Strategic Action Programme to address Pollution from Land-based Activities, which was held in Ischia, Italy, from 15-18 June 1997. Following the comments and corrections made during the meeting, the new version of the report was formulated, and was tabled (UNEP(OCA)/MED WG.136/Inf.4) at the Second Meeting of Government-designated Experts to examine a Strategic Action Programme to address Pollution from Land-based Activities, which was held in Athens, Greece, from 13-16 October 1997. Comments made at that meeting are incorporated in this present report.

2. SUMMARY AND ANALYSIS OF COUNTRY RESULTS

2.1 PRESENTATION OF RESULTS

2.1.1 HOT SPOTS

The results of the country analyses are given in Annex II in separate tables for the hot spots and sensitive areas for each of the 20 countries that prepared country reports. With respect to the information provided by Monaco in response to the questionnaires, this showed that pollution levels in Monaco did not warrant its inclusion in the list of countries with pollution hot spots or sensitive areas. Each table of hot spots is followed by brief notes highlighting the more important comments made in the country reports addressing the main constraints, gaps and the particular methods used in compiling some data in the tables.

Annex III gives summary tables of the data compiled in the country reports. It contains three summary tables:-

- Table (III-1) lists the 115 priority hot spots identified in the country reports, ranked in descending order by country of their weighted total impact. For each hot spot, the table lists the source of pollution (domestic, industrial or mixed), and the estimated cost for proposed remedial actions.

[1] In fact, only one country referred to the establishment of an inter-ministry working group

- In Table (III-2), the population and pollution loads (BOD, COD, Total-N, Total-P and TSS) are given for each hot spot listed in Table (III-1)

- Table (III-3) compiles the data in the national reports on Toxic, Persistent and liable to Bioaccumulate substances (TPBs) (Hg, Cd, Pb, Cr, Cu, Zn, Ni, POPs and others mainly hydrocarbons)

- Table (III-4) consolidates the information on sensitive areas contained in the country reports.

2.1.2 SENSITIVE AREAS

As for sensitive areas (SAs), the national reports identified 51 sensitive areas in 16 countries, as shown in the tables in Annex II.

2.2 ANALYSIS OF RESULTS

- 115 priority hot spots have been identified as impacting public health, drinking water quality, recreation and other beneficial uses, aquatic life (including biodiversity), as well as economy and welfare (including marine resources of economic value). Some idea of the distribution of their weighted total impacts can be gleaned from Table (1).

Table (1)

	Number of Hot Spots	% of Total
Hot Spots scoring > 25	2	1.7%
Hot Spots scoring 25-20	25	21.7%
Hot Spots scoring 20-15	54	47.1%
Hot Spots scoring 15-10	29	25.2%
Hot Spots scoring < 10	4	3.4%
Hot Spots with no score	1	0.9%
Total	**115**	**100%**

- Only two hot spots (Lake Manzala in Egypt and Izmir in Turkey) scored a total weighted impact greater than 25. A little over one fifth were in the (25-20) bracket, while about one fourth are in the (15-10) bracket. Almost one half of the hot spots are in the (20-15) bracket.

- Almost all hot spots are considered, in the national reports, as having transboundary impacts on the six issues considered in the analysis.

Table (2) groups the hot spots according to the **sources of pollution** (domestic, industrial, mixed). For more than half the number, the sources are mixed. For just under one quarter, the sources are industrial, and the same for domestic sources.

Table (2)

Source of the pollution	Domestic	Industrial	Mixed
No. of Hot Spots	29	27	59
% of total	25.2 %	23.5 %	51.3 %

- It is worth noting that a limited number of pollution hot spots is responsible for the bulk of pollution loads:

BOD loads: of the total reported according to existing data, BOD load (753,196 t/yr) **four hot spots** contribute more than 40,000 t/yr each. They account for no less than (414,773 t/yr) or 55 % of the total. Table (3) lists these four hot spots in descending order of BOD loads.

Table (3)

Hot Spot	BOD load (t/yr)
El-Mex Bay (Egypt)	219,498
Abu-Qir Bay (Egypt)	91,701
Inner Saronic Bay (Greece)	59,386
Izmir (Turkey)	44,188
Totals	414,773

- Of these four hot spots, two are in the greater Alexandria area (Abu-Qir Bay to the east and El-Mex Bay to the west). They account for 41.3 % of the total BOD load for all 115 hot spots.

- **COD loads: Six hot spots** are responsible for COD loads of more than 100,000 t/yr. Together they account for 66.7 % of the total COD loads (2,062,770 t/yr) as shown in table (4)

Table (4)

Hot spot	COD load (t/yr)
Abu-Qir Bay (Egypt)	575,490
Iskendrun (Turkey)	222,080
Haifa Bay (Israel)	183,770
El-Mex Bay (Egypt)	175,654
Inner Saronic Bay (Greece)	118,735
Silifke (Turkey)	100,290
Total	1,376,019

- One hot spot (Abu Qir Bay) is responsible for more than one quarter of the total COD load.

- Two hot spots in Alexandria account for 36.4% of the total COD loads. They are the same two hot spots responsible for 41.3% of the total BOD load.

TPBs:- within the limitations of the considerable gaps in the data collected on TPBs, compared to other parameters, **eight hot spots,** are prominent as main sources of TPBs. Table (5) summarises their contributions to the different TPBs for which data were compiled in the national reports, and the percentages of their combined shares of the total discharges of TPBs.

Table (5)

TPB (Kg/yr)	Hg	Cd	Pb	Cr	Cu	Zn	Ni	POPs	Others (t/yr) mainly hydro-carbons
Hot Spot									
Abu Qir Bay Egypt)		31+	193+	362+	2,669+	3,394+	859		1906 (oil)
Haifa Bay (Israel)		2,600			3,250	58,500			50,000 (oil)
Tartous (Syria)		54	2,703	1,784	5,406	5,163	2,649		
Lattakia (Syria)		85.4	4,271	2,135	4,271	7,686	2,562		
El-Mex Bay (Egypt)	1278(*)	1,562		530	25,430	46,524			1,319 (oil)
Gush Dan (Israel)	60	430	1,670	11,400	19,000	54,000	2,500		
Sfax South (Tunisia)					3,456	17,000			
Larymna Bay (Greece)						313,170			
Totals	**1338**	**4762.4+**	**8837+**	**16211+**	**63,482+**	**505,737+**	**8570**		**53,225**
% of total TPB discharges	**93.%**	**81.4%**	**48.2%**	**70.1%**	**96.3%**	**82.15**	**75.1%**		**97.2%**

- As can be seen from the table, these eight hot spots are responsible for:
  - more than 90% of the discharges of mercury, copper and oil.
  - more than 80% of cadmium and zinc.
  - more than 70% of chromium and nickel.
  - and just under 50% of lead.

The concentration of population in and around the pollution hot spots identified reveals some significant aspects (Table 6).

(*) A caustic soda plant at this location, using mercury cells, has been dismantled and is buried in a secure landfill in the desert south of Alexandria.

Table (6)

Population	> 1,000,000	1,000,000 - 500,000	500,000 - 250,000
No. of cities	12	11	14
Total population for the group	25,479,864	7,714,566	3,837,588
% of total	60.5%	18.3 %	9.1%

- Although the number of urban concentrations around hot spots of populations of one million and more is only twelve, they account for a little more than 60% of the total population in and around hot spots:-

- Greater Alexandria with a population of over 4 million, and responsible for around 40% of Egypt's total industrial production, is prominent as a major source of pollution. The Inner Saronic Gulf in Greece, with a population of over 3 million is also a significant source of BOD and COD.

- There are eleven cities with populations between one million and half a million. They house under 8 million people and thus account for a little less than one fifth of total population around hot spots. None of these cities is particularly prominent as a significant source of pollution.

- Fourteen cities have populations between 500,000 and 250,000. Their total population is about one million less than that of the previous group. Of these 15 cities, Tartous, in Syria and Sfax South in Tunisia also appear on the list of major sources of TPBs (Table 5).

Table (7) shows the total number of pollution hot spots for each source of pollution (domestic, industrial, mixed) as well as the share of each group of the total BOD and COD loads of all hot spots.

Table (7)

Source of pollution		Domestic	Industrial	Mixed	Totals
No. of Hot Spots		29	27	59	115
% of total number		25.2%	23.5%	51.3%	100%
BOD load	t/yr	121,027	21,976	610,193	753,196
	% of total	16.1%	2.9%	81%	100%
COD load	t/yr	509,896	77,705	1,475,189	2,062,770
	% of total	24.7%	3.8%	71.5%	100%

- The fifty-nine hot spots having mixed sources of pollution account for 81.1% of total BOD load and about three quarters of COD load. Six of them appear in Table (6) as main sources of TPBs.

  Note: Spain did not provide any information on pollution loads.

Table (8) gives the number of sensitive areas in each of the sixteen countries.

Table (8)

Country	*Albania*	*Algeria*	*Croatia*	*Cyprus*	*Egypt*	*France*	*Greece*	*Italy*	*Lebanon*	*Malta*	*Morocco*	*Slovenia*	*Spain*	*Syria*	*Tunisia*	*Turkey*	*Total*
No. of Sas	3	6	5	1	1	3	2	7	2	3	1	2	3	5	1	6	51

Table 9.1 Pollution Hot Spots - Problems and their Root Causes

PROBLEMS	IMPACT*	STAKEHOLDERS	ROOT CAUSES AND POSSIBLE SOLUTIONS			POTENTIAL TRANSBOUNDARY EFFECTS
			PROXIMATE	ULTIMATE	POSSIBLE SOLUTIONS	
1. Control and reduction of Pollution at 115 Priority Hot Spots in the Mediterranean. 2. Reduction of eutrophi-cation and excessive algal bloom in areas which are most severely affected by such events	L-H N-H T-H	• National and local authorities • Polluting enterprises • Municipalities • Industry • Tourism • Private sector • Academic institutions • NGOs • General public • International organizations	• High concentration of nutrients locally • Major microbiological loads • High concentrations of heavy metals and organic pollutants • Deterioration of the organoleptic characteristics of receiving waters • Concentration of population in and around hot spots	• Inadequate/absence of domestic wastewater treatment plants • Inadequate/absence of industrial wastewater treatment plants • Lack of "before the pipe" approach for industrial wastewater minimization • Lack of measurement network and/or data for monitoring seawater pollution • Lack of integrated management	• Prepare preinvestment studies for each of the Priority Hot Spots • Carry out environmental audits of industries in priority hot spots, revise cost estimates accordingly • Evaluate approaches in ICZM to clarify and optimise the complex relationship between urbanisation and industrialisation in the Mediterranean coastal zone • Prepare individual action plan for remedial actions in order to control pollution at Priority Hot Spots • Implementation of relevant compliance and trend pollution monitoring programmes at the locations of the hots spots • Implement action plan for remedical actions • Revision of methodology used in determination of weighted factors for impact (including transboundary impact) and their comparative analysis	• Eutrophication and concomitant excessive algal bloom • Pollution of the marine environment • Degradation of the coastline with transboundary effects (effects on tourism, coastal development, population)

* L – Local; N – National; T – Transboundary; I – Insignificant; M – Medium; L - Low

Table 9.2 Pollution Sensitive Areas - Problems and their Root Causes

PROBLEMS	IMPACT*	STAKEHOLDERS	ROOT CAUSES AND POSSIBLE SOLUTIONS			POTENTIAL TRANSBOUNDARY EFFECTS
			PROXIMATE	ULTIMATE	POSSIBLE SOLUTIONS	
1. Assessment and protection of fifty-one identified sensitive coastal areas	L-H N-H T-M	• National and local authorities • Polluting enterprises • Municipalities • Industry • Tourism • Private sector • Academia institutions • NGOs • General public • International organizations	• Inadequate/absence of domestic wastewater treatment plants • Inadequate/absence of industrial wastewater treatment plants • Lack of "before the pipe" approach for industrial wastewater minimization • Lack of control - enforcement due to lack of measurement network and/or data for monitoring seawater pollution	• Lack of coordinated plans for pollution minimization • Lack of implementation of relevant legislation • Lack of integrated management • Absence of priority areas of protection	• Prepare action plan for the remedial actions for identified sensitive areas • Remedial actions for identified sensitive areas, in accordance with preliminary cost estimates • Development of the standardized methodology for the selection of sensitive areas and for the determination of the cost of their protection	• Degradation of transboundary sensitive areas due to pollution • Loss of habitats of transboundary or migratory species

* L – Local; N – National; T – Transboundary; I – Insignificant; M – Medium; L - Low

3. COMMENTS

3.1 GENERAL

Time constraints and the tight schedule for preparing and reviewing the country reports meant that the results are based on existing data. There was no time available for further measurements or verification of existing information. Had it not been for the previous efforts of MEDPOL focal points and the data they accumulated, it would not have been possible to prepare a more or less coherent picture of the situation in the Mediterranean coastal zones in such short time.

It is particularly worthwhile to note that all the Mediterranean countries eligible for GEF or donor funding have prepared national reports that provide useful information.

Most country reports underscore important gaps and constraints that are worth highlighting here. Most important among these are:

- scarcity of information on quality of receiving waters
- difficulty of obtaining sufficient information on industrial effluents and estimates of remedial actions to reduce their undesirable impacts.
- The need under the new orientations of MAP and the Barcelona Convention on LBS to establish good working relations between the, so far, predominantly scientific nature of the MEDPOL national focal points and other socio-economic institutions involved in environmental protection (government, business, academia and NGOs).

3.2 SPECIFIC

It is clear that while most pollution hot spots were considered as having all embracing transboundary impacts, no consideration of location, prevailing currents, etc. seem to have been involved in characterising these impacts as transboundary.

The identification of sensitive areas and their analysis leaves a lot to be desired. The impression given by the national reports is that there has been in many cases confusion about applying the definition of sensitive areas given in the guidelines as well as reporting on the sensitive areas identified.

The majority of remedial actions proposed are of the wastewater treatment type. While appropriate in the case of domestic waste waters, this is highly undesirable for industrial effluents, where pollution prevention/ cleaner production, pollution prevention, approaches are more rational and efficient than "end of pipe" treatment of effluents.

There are notable gaps in cost estimates for remedial actions. The total for all hot spots identified could be more than the estimated amounts.

Some estimates are given for necessary feasibility studies or capacity building projects.

Estimates for new plant and systems, or the upgrading of existing ones, cover only procurement, construction and start-up costs. No costs are given for operating and maintenance costs.

Annex I

- Outline of Methodology used in the Analysis

- Questionnaires:

  Municipal Discharges

  Industrial Discharges

1. OVERVIEW ON THE IDENTIFICATION OF POLLUTION "HOT SPOTS" AND "SENSITIVE AREAS"

1.1 Aim

Within the context of the amended Protocol for the Protection of the Mediterranean Sea against Pollution from Land-based Sources and Activities, regional action plans and programmes should be elaborated for the elimination of pollution deriving from land-based sources and activities. For the implementation of the above provision, a Strategic Action Programme (SAP) for the Mediterranean Sea will be formulated. The SAP will also involve the **identification and assessment of** problems and causes including **pollution "hot spots" and "sensitive areas"**.

The aim of the above task is to:

- identify potential Mediterranean pollution "Hot spots" based on the assessment of contaminants reaching the Mediterranean Sea (a) from coastal cities or urban coastal agglomerates with population above 100,000 and some other selected coastal cities and (b) due to industrial activities;

- identify areas in the Mediterranean Sea which are particularly sensitive to damage from land-based activities;

- prepare a list of "Regional Priority Hot Spots" which should have regional priority for intervention in order to control or eliminate pollution at hot spots and assess the relative importance of each of the listed "Hot Spots";

- propose interventions (national or regional) required to address the problems and identify, whenever possible, alternative courses of action and assess, whenever possible, their costs.

1.2 Description of the Task

The task consisted of the following:

1.2.1 **Preliminary identification of potential Mediterranean hot spots** in the country, based on existing data, surveys, etc. by using the professional expertise on this issue. As an indication, the number of hot spots proposed was related to (a) coastal cities and urban coastal agglomerates with considerable population (e.g. more than 100,000 taking also into consideration the size of each individual country) and (b) to main industrial facilities discharging directly into the Mediterranean.

Then, in order to **confirm that these proposed potentially hot spots, were really hot spots**, information was required on the following:

(a) Data on load, collection, treatment and disposal of the coastal cities wastewater and for each (whenever possible) of the characteristics according to the questionnaire provided.

(b) Data on industrial pollution for every major industrial facility, discharging directly into the sea, for each of the parameters according to the questionnaire provided. If, for certain reasons, technical data were not available, then data on the activity of the industry/activity sometimes have been provided (raw materials consumed or products manufactured).

1.2.2 Information and, if possible, **data on sensitive areas** were required on the same basis as for hot spots.

2. HOT SPOTS DEFINITION AND CRITERIA

2.1 Hot Spots

(a) **Point sources** on the coast of the Mediterranean Sea which potentially **affect** human health, ecosystems, biodiversity, sustainability or economy in a significant manner. They are the **main points where high levels of pollution loads** originating from domestic or industrial sources are being **discharged;**

(b) Defined **coastal areas** where the **coastal marine environment is subject to pollution** from one or more point or diffused sources on the coast of the Mediterranean which potentially **affect** human health in a significant manner, ecosystems, biodiversity, sustainability or economy.

2.2 Hot Spots Indicators (primary)

- BOD, COD
- nutrients (phosphorus, nitrogen)
- total suspended solids
- oil (petroleum hydrocarbons)
- heavy metals
- persistent organic pollutants
- radioactive substances (whenever applicable)
- litter
- microorganisms (faecal coliforms, *E.coli*)

2.3 Evaluation of Priority Hot Spots

A ranking system from 1-6 was followed to show the severity of each of the effects on the identified hot spots.

It was required to prepare a table on the priority hot spots by evaluating them using the following criteria:

- The risk exerted by the point sources with effects on:
  - public health
  - drinking water quality
  - recreation
  - other beneficial uses
  - aquatic life (including biodiversity)
  - economy and welfare (including marine resources of economic value).

  has been graded as follows:

  1 for no effects
  2 for slight effects
  3 for moderate effects
  4 for major effects
  5 for severe effects
  6 for extreme effects

- In order to weigh the risk in an equal manner, a multiplier depending on the importance of the effects on the several issues has been applied to the grades:

  1.0 for public health
  0.9 for drinking water quality
  0.8 for recreation
  0.8 other beneficial uses
  0.7 for aquatic life including biodiversity
  0.7 economy and welfare including marine resources of economic value

- *Note:* Taking into account that absolute grading levels may differ for each country and for each evaluation, there was a need for a relative index (0-100).

The following table explains the criteria for ranking the effects:

Public Health	
extreme effects (6)	Domestic wastewater loads of more than 30 tons BOD/day with no disinfection and having a high probability of direct contact to human beings. Wastewater containing more than 50 mg/L of heavy metals and having a possible contact to the public at the discharge point. Wastewater containing radioactivity or hazardous substances above WHO limitation.
severe effects (5)	Domestic wastewater loads of more than 15 tons BOD/day with no disinfection and having a high probability of direct contact to human beings. Wastewater containing more than 20 mg/L of heavy metals and having a possible contact to the public at the discharge point.
major effects (4)	Domestic wastewater loads of more than 10 tons BOD/day with no disinfection and having a high probability of direct contact to human beings. Wastewater containing more than 10 mg/L of heavy metals and having a possible contact to the public at the discharge point.
moderate effects (3)	Domestic wastewater or water containing heavy metals with no direct effect to human beings.
slight effects (2)	Any discharge which contains toxic substances or pathogens and is not mentioned in (3) - (6).
no effects (1)	Discharge with no effect.

Drinking Water Quality	
extreme effects (6)	Any wastewater directly discharged to a water body which is used as drinking water.
severe effects (5)	Any wastewater directly discharged to a water body which is not used as drinking water but is potentially a drinking water source.
major effects (4)	Indirect discharges to water sources with improper filtration.
moderate effects (3)	Indirect discharges to a water body with proper infiltration.
slight effects (2)	Discharge representing a potential risk in emergency situations (flood, earthquake).
no effects (1)	Discharge with no effect.

Recreation	
extreme effects (6)	Discharges with more than 300 mg/L of oil which may cause a significant odour that directly affects a recreational area from a distance of 100 m.
severe effects (5)	Discharges which may cause a significant odour that directly affects a recreational area from a distance of 500 m.
major effects (4)	Discharges with no odour at a distance of 1000 m from the recreational area deteriorating the aesthetic quality of waters.
moderate effects (3)	Discharges at a distance of 5000 m from the recreational area.
slight effects (2)	Discharges causing a potential risk to the environment.
no effects (1)	No effect.

Other Beneficial Uses	
extreme effects (6)	Discharges containing a high level of solid wastes or odours which can cease the present beneficial use of the water body (transportation, sport activities, aquaculture).
severe effects (5)	Discharges containing a high level of solid wastes or odours which can potentially cease the present beneficial use of the water body (transportation, sport activities, aquaculture).
major effects (4)	Discharges containing a high level of solid wastes or odours which can harm the present beneficial use of the water body (transportation, sport activities, aquaculture).
moderate effects (3)	Discharges containing a high level of solid wastes or odours which can potentially harm the present beneficial use of the water body (transportation, sport activities, aquaculture).
slight effects (2)	Discharges containing a high level of solid wastes or odours which may harm the present beneficial use of the water body (transportation, sport activities, aquaculture).
no effects (1)	Discharge with no effect.

Aquatic Life (including biodiversity)	
extreme effects (6)	Any discharge which may reduce the oxygen content of the receiving body below 0.5 mg O_2/L. Any discharge which contains a heavy metal concentration of more than 50 mg/L. Any discharge which contains an oil concentration of 400 mg/L.
severe effects (5)	Any discharge which may reduce the oxygen content of the receiving body below 1 mg O_2/L. Any discharge which contains a heavy metal concentration of more than 30 mg/L. Any discharge which contains an oil concentration of 200 mg/L.
major effects (4)	Any discharge which may reduce the oxygen content of the receiving body below 2 mg O_2/L. Any discharge which contains a heavy metal concentration of more than 20 mg/L. Any discharge which contains an oil concentration of 100 mg/L.
moderate effects (3)	Any discharge which causes oxygen depletion.
slight effects (2)	Any suspicious discharge.
no effects (1)	Discharge with no effect.

Economy and Welfare	
extreme effects (6)	Shutting down of discharging industries would have significant effect on the economy. Investment needed for environmental sound solution more than 20 million dollars.
severe effects (5)	Shutting down of discharging industries would have severe effect on the economy. Investment needed for environmental sound solution more than 10 million dollars.
major effects (4)	Shutting down of discharging industries would have major effect on the economy. Investment needed for environmental sound solution more than 5 million dollars.
moderate effects (3)	Discharging industries having little effect on the economy.
slight effects (2)	Discharging industries having no effect on the economy.
no effects (1)	Discharging industries having no effect on the economy, and already non-feasible for investment.

2.4 Transboundary effects

- The transboundary effects of the hot spots were mentioned in a separate column. These possible transboundary effects involved the following:

  - Fisheries (F)
  - Biodiversity (B)
  - Reduction of regional value of Mediterranean tourism (L)
  - Public Health (P)
  - Habitats (H)

2.5 Nature of Investment and Economic Costs

The identification of the hot spots was necessarily linked to the identification of the causes and the problems that led to this critical situation. Therefore it was essential that a determination of the nature of investment, based on the causes identified and the intervention to be followed were required and a preliminary estimated financial requirement be proposed, taking into consideration the costs involved for similar projects in the particular country.

3. SENSITIVE AREAS

Estuaries and coastal waters/ of natural or socio-economic value are considered sensitive if they are at higher risk to suffer negative impacts from human activities.

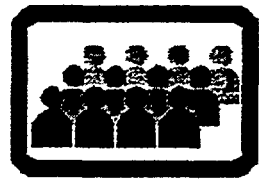
Natural characteristics may determine the vulnerability of a coastal system, for example a bay with low flushing rate is more sensitive to pollution impacts than one which is well flushed. Human activities determine the level of risk, hence planned development may increase the risk of environmental degradation. Both vulnerability and risk contribute to the "sensitivity" of a particular area or system in the context of this assessment.

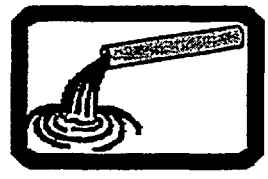
4. PROCEDURE

For the successful implementation of the above project, every National Coordinator was required to provide information and existing data on the Hot Spots and Sensitive Areas in his/her country. In order to facilitate the procedure and in view of the limited available time for the completion of this task, the following approach was taken:

Every National Coordinator prepared a list of potential hot spots and sensitive areas in his/her country according to his expertise and knowledge and based on existing data, surveys carried out so far and on information already existing. As an indication, the number of hot spots proposed was related to (a) coastal cities and urban coastal agglomerates with a population of more than 100,000 inhabitants, and other selected coastal cities with considerable population, taking into account the seasonal influence due to tourists and the size of each individual country, and (b) main industrial facilities discharging directly into the Mediterranean and not through a municipal sewage system, which are considered as potential hot spots. For the above purpose, and after the identification of the hot spots and sensitive areas for which the above mentioned material was of assistance, it was of major importance that the following questionnaires were filled in, with already-existing information, in order to support the fact that the proposed hot spot was a real one.

5. QUESTIONNAIRES





HOT SPOTS IN THE MEDITERRANEAN

COASTAL CITIES

MUNICIPAL DISCHARGES

MUNICIPAL DISCHARGES

Country: .....

City: .....

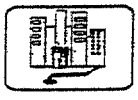


1. Permanent population ..... (last census taken .....)



2. Average seasonal increase.....

(months of tourist season .....)

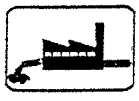


3. Population served by municipal sewer system .....



4. Main industries (individual or group) served by municipal sewer system:

4.1 Name and type of activity and size (if many, use table at the end)



5. Sewage treatment plant: 5.1 Existent ..... since when

5.2 Non-existent .....

5.3 Planned to be constructed on .....

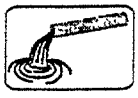
6. Wastewater flow to the treatment plant ..... (m^3/day)

(When more than one exists, specify for each one) ..... (m^3/day)

6.1 Type of final treatment before discharge:

- Primary ..... (YES or NO)
- Secondary ..... (YES or NO)
- Tertiary ..... (YES or NO)

7. Total wastewater treated ..... (m^3/day)



8. Total wastewater discharged (into the marine environment) (for the entire city)

8.1 Treated ..... (m^3/day

8.2 Untreated ..... (m^3/day)

9. Type and location of discharge: (when more than one, specify for each one)

.....

10. Pollution loads at the discharge point:

10.1 BOD_5 ..... (t/y)

10.2 COD ..... (t/y)

10.3 Total-N ..... (t/y)

10.4 Total-P ..... (t/y)

10.5 TSS ..... (t/y)

10.6 Oil (Petroleum Hydrocarbons) ..... (t/y)

10.7 Heavy metals

10.7.1 ..... (Kg/y)

10.7.2 ..... (Kg/y)

10.7.3 ..... (Kg/y)

10.8 Organochlorines

10.8.1 ..... (Kg/y)

10.8.2 ..... (kg/y)

10.9 Faecal coliforms ..... (col/100 mL)

11. Quality of receiving environment (water, sediments and biota)

11.1 Total-N ..... (mg/L)

11.2 Total-P ..... (mg/L)

11.3 TSS ..... (mg/L)

11.4 Oil (Petroleum Hydrocarbons) ..... (mg/L)

11.5 Heavy metals

11.5.1 ..... (µg/L)

11.5.2 ..... (µg/L)

11.5.3 ..... (µg/L)

11.6 Organochlorines

11.6.1 ..... (µg/L)

11.6.2 ..... (µg/L)

11.7 Faecal coliforms ..... (col/100 mL)

11.8 PCBs ..... (µg/L)

11.9 Radioactive Substances (if applicable)

11.10 Any other relevant information

12. When a sewage treatment plant and/or sewer system are non-existent, give estimation of the cost needed for the construction (secondary treatment will be included):

.....

13. Additional information regarding the disposal of solid wastes that may affect the receiving waters:

.....

.....

.....

14. Any other remarks:

.....

.....

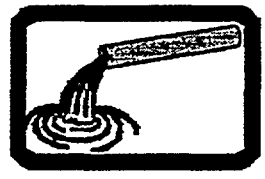
.....

Table to be used in connection with point 4.1

Name of enterprise	Type of activity	Size	Population equivalent *

* Population equivalent will be estimated by using conventional references.





HOT SPOTS IN THE MEDITERRANEAN

INDUSTRIES DISCHARGING DIRECTLY INTO THE SEA

INDUSTRIAL DISCHARGES

INDUSTRIAL DISCHARGES DIRECTLY INTO THE SEA

Country: .....

Name of Company: .....

1. Discharge site (geographical position) .....

.....



2. Type of industry: (according to the indicated list)

.....

- *Energy production*
- *Fertilizer production*
- *Production and formulation of biocides*
- *The pharmaceutical industry*
- *Petroleum refining*
- *The paper and paper-pulp industry*
- *Cement production*
- *The tanning industry*
- *The metal industry*
- *The shipbuilding and repairing industry*
- *The textile industry*
- *The electronic industry*
- *The recycling industry*
- *Other sectors of the organic chemical industry*
- *Other sectors of the inorganic chemical industry*
- *Food processing*
- *Treatment and disposal of hazardous wastes*
- *The waste management industry*



3. Industrial wastewater treatment .....
(if YES, please specify type of treatment):

.....

.....

.....

.....

4. Way of discharge:

4.1 By Outfall (YES or NO) .....

4.2 On shore (YES or NO) .....



5. Total wastewater treated ..... (m^3/day)

6. Total wastewater discharged: 6.1 Treated ..... (m^3/day)

6.2 Untreated ..... (m^3/day)

7. Wastewater quality and pollution loads at point of discharge:

		Wastewater Quality		***Pollution Loads***	
7.1	BOD_5	.....	(mg/L)	.....	(t/y)
7.2	COD	.....	(mg/L)	.....	(t/y)
7.3	Total-N	.....	(mg/L)	.....	(t/y)
7.4	Total-P	.....	(mg/L)	.....	(t/y)
7.5	TSS	.....	(mg/L)	.....	(t/y)
7.6	Heavy metals	.....	(µg/L)	.....	(Kg/y)
	7.6.1	.....	(µg/L)	.....	(Kg/y)
	7.6.2	.....	(µg/L)	.....	(Kg/y)
	7.6.3	.....	(µg/L)	.....	(Kg/y)
7.7	Persistent Organic Pollutants:				
	7.7.1 PCBs	.....	(µg/L)	.....	(Kg/y)
	7.7.2	.....	(µg/L)	.....	(Kg/y)
	7.7.3	.....	(µg/L)	.....	(Kg/y)
	7.7.4	.....	(µg/L)	.....	(Kg/y)

7.8 Oil (petroleum hydrocarbons) ..... (t/y)

8. Indirect evaluation of pollution (to be filled in when 5, 6 and 7 are not answered):

PRODUCTION FIGURES

Type of Product	Unit	Annual Production
.....	.....	.....
.....	.....	.....
.....	.....	.....
.....	.....	.....

RAW MATERIALS IN USE

Type of Raw Material	Unit	Annual Consumption
.....	.....	.....
.....	.....	.....
.....	.....	.....
.....	.....	.....

ESTIMATED POLLUTION LOAD

Pollution loads discharged into receiving waters	mg/L	t/y
.....	.....	.....
.....	.....	.....
.....	.....	.....
.....	.....	.....

9. Any other remarks:

.....
.....
.....
.....

10. Selected remedial measures (including preventive and end-of-pipe treatment methods) and cost estimates:

.....
.....

11. Air emission loads (if any): .....

.....

12. When power plants above 200 MW (including nuclear) and cement industries are existing in the coastal zone, specify their emission loads: .....
.....

.....

13. Solid and hazardous wastes with water pollution potential (if any): .....

.....

.....

Annex II

Summary of Country Tables:

A. Priority Pollution Hot Spots

B. Priority Pollution Sensitive Areas

A. PRIORITY POLLUTION HOT SPOTS

For easy reference to the acronyms or initials used in the following tables, the explanation below should be considered:

WWTP	:	*Wastewater treatment plant*
DWWTP	:	*Domestic wastewater treatment plant*
IWWTP	:	*Industrial wastewater treatment plant*
VTS-HAC	:	*Vessel Traffic Service-Harbour Approach Control*

Transboundary effects:

F : Fisheries
B : Biodiversity
L : Reduction of regional value of Mediterranean tourism
P : Public Health
H : Habitats

Priority Pollution Hot Spots in Albania

Name	Type	Public Health	Drinking Water Quality	Aquatic Life	Recreation	Other beneficial use	Welfare and economy	Weighted total	Relative importance index	Nature of investment	Transboundary aspect(s)	Preliminary estimated financial requirement (in US$)
Durres	domestic	4	1	3	4	3	1	13.3	100	WWTP + reconstruction of a sewerage system	P, L, H	48 million
Vlore	domestic	4	1	3	4	3	1	13.3	98	WWTP + reconstruction of a sewerage system	P, L, H	48 million
Drini river	domestic industrial	2	1	3	4	2	2	11.2		Study of pollution sources in the river basin	B, F	500,000
Mati river	domestic	2	1	3	4	2	2	11.2		- ditto -	B, F	500,000
Semani river	domestic	2	1	3	4	2	2	11.2		- ditto -	B, F	500,000
Shkumbini river	domestic	2	1	3	4	2	2	11.2		- ditto -	B, F	500,000
ex PVC factory - Vlora	industrial	4	1	2	1	1	2	9.3	80	sanitation of mercury spoiled soil (See Chapter 6)	P	2 million
ex chemical factory - Durres	industrial	4	1	5	1	1	2	11.4		sanitation of toxic solid waste dumping site (See Chapter 6)	F, B, P	2-3 million

- Data used does not always reflect the current situation
- Lack of reliable information on pollution loads or quality of receiving waters
- No information on sources of costing remedial actions provided

Priority Pollution Hot Spots in Algeria

Name	Type	Public Health	Drinking Water Quality	Aquatic Life	Recreation	Other beneficial use	Welfare and economy	Weighted total	Relative importance index	Nature of investment	Transboundary aspect(s)	Preliminary estimated financial requirement (in US$)
Oran	domestic + industrial	5	1	4	6	5	5	21	100	DWWTP (Extension/ rehabilitation) IWWTP (Construction)	F,B,L,P	35 na
Rouiba-Peghaia	domestic + industrial	5	2	5	5	4	5	21	100	IWWTP (Construction)	F,B,L,P,H	2
Ghazaouet	domestic + industrial	5	1	6	5	4	5	20,8	99	DWWTP (Construction) IWWTP (Construction)	F,B,L,P,H	30 na
Alger	domestic + industrial	5	1	4	6	4	5	20,2	96	DWWTP (Rehabilitation) IWWTP (Construction)	F,B,L,P	1.5 na
Mostaganem	domestic + industrial	4	1	6	4	4	5	20	95	DWWTP (Construction) IWWTP (Construction)	F,B,L,P,H	25 na
Bejaia	domestic + industrial	5	1	5	5	4	4	19,4	92	DWWTP (Extension/ rehabilitation) IWWTP (Construction)	F,B,L,P,H	0.9 na
Annaba	domestic + industrial	5	1	4	5	4	4	18.7	89	DWWTP (Extension/ rehabilitation) IWWTP (Construction)	F,B,L,P,H	0.6 na
Skikda	domestic + industrial	5	1	5	4	3	4	17,8	84.7	DWWTP (Construction) IWWTP (Construction)	F,B,L,P,H	20 na

- No detailed measurements of industrial pollution loads available. Little cooperation from industry.
- Measurements of quality of receiving waters are beginning to yield results.
- Data used were compiled at different dates
- Basic assumptions of cost estimates of remedial actions for municipal wastewaters are given; but none for industry.
- DWWTP : Domestic wastewater treatment plant
- IWWTP : Industrial wastewater treatment plant

Priority Pollution Hot Spots in Bosnia and Herzegovina

Name	Type	Public Health	Drinking Water Quality	Aquatic Life	Recreation	Other beneficial use	Welfare and economy	Weighted total	Relative importance index	Nature of investment	Transboundary aspect(s)	Preliminary estimated financial requirement (in US$)
Neum	Domestic	n.a								WWTP reconstruction	P,H,F,B	25 million

Priority Pollution Hot Spots in Croatia

Name	Type	Public Health	Drinking Water Quality	Aquatic Life	Recreation	Other beneficial use	Welfare and economy	Weighted total	Relative importance index	Nature of investment	Transboundary aspect(s)	Preliminary estimated financial requirement (in US$)
Pula	domestic industr.	4	1	4	4	3	6	17.5	94	sewer + WWTP extension	B, L, P	30 million
Rijeka	domestic	4	1	3	4	1	6	15.2	83	WWTP extension	F, B, L, P	25 million
Oil rafin.	industr.	2	1	6	4	3	6	16.9	93	underground sanitation	B, P	8 million
Cokery	industr.	6	1	4	5	1	1	15.2	87	wastewater treatment	B, P	1.5 million
Zadar	domestic industr.	5	1	4	4	3	6	18.5	97	sewer+ WWTP construction	F, B, L, P	35 million
Tannery	industr.	6	1	2	2	1	2	12.1	75	WWTP reconstruction	B,	1.5 million
Adria	industr.	2	1	3	6	5	3	15.9	90	WWTP reconstruction	L	2 million
Sibenik	domestic industr.	5	1	3	4	3	6	18.8	98	sewer exten. + WWTP construction	B, L, P, H	30 million
Split	domestic industr.	6	1	6	3	3	6	21.1	100	sewerage+WWTP const.	F, B, L, P, H	66 million
Kastela b.	domestic industr.	6	1	1	6	4	6	21.7	100	See Split		
Kaltenberg	industr.	2	1	6	3	3	3	16.0	91	WWTP construction	B,	2 million
Dubrovnik	domestic	3	1	2	4	1	6	14.5	80	sewer extension	L, P	6 million
Krka river	domestic industr.	2	1	2	4	1	3	10.4	78	See Krka est.	B,L,P	
Neretva river	domestic industr.	2	1	2	2	1	3	8.8	70	Management plan	F,B,L,P	700,000

- Some cities of populations less than 50,000 were considered (either for being tourist areas, or on semi-enclosed bays and channels)
- Some coastal areas not researched could become sensitive areas
- No information on sources/ basis of costing remedial actions provided

Priority Pollution Hot Spots in Cyprus

Name	Type	Public Health	Drinking Water Quality	Aquatic Life	Recreation	Other beneficial use	Welfare and economy	Weighted total	Relative importance index	Nature of investment	Transboundary aspect(s)	Preliminary estimated financial requirement (in US$)
ETKO	Winery and distillery	2	1	4	3	3	3	12.6	100	WWTP	L	550,000
SODAP	do.	2	1	4	3	3	3	12.6	100	WWTP	L	720,000
LOEL	do.	2	1	4	3	3	3	12.6	100	WWTP	L	500,000
KEO	do.	2	1	4	3	3	3	12.6	100	WWTP	L	745,000
KEO B	Brewery	2	1	4	3	3	3	12.6	100	WWTP	L	560,000
Sea outfall of Limassol sewerage treatment plant	Domestic	2	1	2	2	2	2	8.9	71	Extension of sea outfall to be 1 km length	L	2 million
Vassilikos Cement Factory	Dust	2	1	3	4	2	3	11.9	94	Improvement or installation of better filters	B	500,000
Cyprus Petroleum Refinery	Metal and oil Contamination	2	1	2	2	1	2	8.1	64	Separation of contaminated material and incineration		1 million
Dhekelia Desalination Plant	Brine	1	1	3	2	1	1	7.5	50	Better disposal of brine	B	

- Cost estimates for remedial actions based on previous feasibility studies or estimates.

Priority Pollution Hot Spots in Egypt

Name	Type	Public Health	Drinking Water Quality	Aquatic Life	Recreation	Other beneficial use	Welfare and economy	Weighted total	Relative importance index	Nature of investment	Transboundary aspect(s)	Preliminary estimated financial requirement (in US$)
El-Manzala	Mixed (Wastewater)	6	4	6	5	6	5	26.1	100	WWTP (Rehabilitation)	FHBLP	
Abu-Qir Bay	Mixed	6	1	6	6	6	6	24.9	95	WWTP (Construction)	FHBLP	61.6 million+
El-Mex Bay	Mixed (Wastewater)	6	1	3	5	5	3	19.1	73	WWTP (Construction)	FHBLP	101.2+
Alexandria	Domestic	4	1	4	6	4	3	17.8	68	WWTP (Construction)	FHBLP	In implementation
Damietta	Mixed (River)	6	6	2	2	1	1	16	61		FHBLP	

- Although sources of cost estimates are provided (see next page), they do not cover all pollution sources

ESTIMATED INVESTMENTS FOR INDUSTRIAL POLLUTION CONTROL IN ALEXANDRIA

- **ABU QIR INDUSTRIAL AREA**

Establishment	Projects	Investment US$	Source of Inf.
1. RAKTA Paper company	Water Recycling. Waste Minimization. Black Liquor Recovery. WW treatment	60,000,000	UNEP/ Dutch Gov.
2. National Paper company	WW treat. CP	8,000,000	AQ IEMP/STC
3. Abu Qir fertilizers	Urea and AMM. Nitrate recovery. Water Recycling	14,000,000	AQ IEMP/STC
4. ISMADYES	Acids recovery. Process modifications. WW treatment	7,500,000	AQ IEMP/STC
5. Misr Rayon	Chemical recovery. Water Recycling CP, residue processing	5,300,000	AQ IEMP/STC
6. Food (Canning, Milk)	CP, residue processing	5,300,000	AQ IEMP/STC
	Sub-total	101,200,000	

- **MEX INDUSTRIAL AREA**

7. Alex. National Steel	Monitoring Network. Water recycling, acid recovery. WW treatment	8,000,000	EPAP Audit
8. Misr Chemical company	water recycling, chemical recovery	4,500,000	Company estimates
9. El-Nasr tanneries	Chrome recovery. CP WW treatment	8,000,000	EPAP Audit
10.Alexandria Pet. Refinery	Water recycling. DAF, process modifications	12,000,000	Company estimates
11.Amerya Textiles	Color matching. Water recycling, upgrading existing WW Treatment plant	7,600,000	EPAP Audit
12.Egyptian petrochemicals	Chemical recovery process rehabilitation	9,500,000	EPAP Audit
13.Amerya Refinery	water recycling, process modifications	12,000,000	EPAP Audit
	Sub-total	61,600,000	

AQ IEMP/STC is Danish and US technical reports
EPAP Audit is World Bank Project for pollution abatement

Priority Pollution Hot Spots in France

Name	Type	Public Health	Drinking Water Quality	Aquatic Life	Recreation	Other beneficial use	Welfare and economy	Weighted total	Relative importance index	Nature of Investment	Transboundary aspect(s)	Preliminary estimated financial requirement (in US$)
Marseille	Municipal	2	1	3	3	3	3	11.9	100	Secondary Treatment Plant	L,F	110 million
Toulon	Municipal	2	1	3	2	2	3	10.4	87	Secondary Treatment Plant	L	40 million
Cannes	Municipal	2	1	3	2	2	3	10.4	87	Secondary Treatment Plant	L	32 million
Frejus	Municipal	2	1	3	2	2	3	10.4	87	Secondary Treatment Plant	L	18 million
Gardanne	Industrial	2	1	1	2	3	5	10.9	92	Implement Investments required by new permit	low, B?	n.a.

- Costs for remedial actions are for upgrading sewage treatment, to EC Directive 91/271/EEC, and are based on informal communication from Agence de l'eau Rhone - Mediterranee-Corse
- Remedial action at Gardanne involves stepwise reduction of discharges according to a permit timetable (p. 9 of the National Report). No economic cost elements were available.

Priority Pollution Hot Spots in Greece

Name	Type	Public Health	Drinking Water Quality	Aquatic Life	Recreation	Other beneficial use	Welfare and economy	Weighted total	Relative importance index	Nature of investment	Transboundary aspect(s)	Preliminary estimated financial requirement (in US$)
Thermaikos gulf	municipal, industrial	6	1	3	4	4	6	19.5	100	expansion of plant & industrial feasibility studies	L	40.6 million
Inner Saronic gulf	municipal, industrial	6	1	3	4	4	5	18.8	96	secondary treatment	L	130 million
Patraikos gulf	municipal, industrial	5	1	4	4	4	4	17.9	92	treatment plant & outfall	L	15 million
Pagasitikos gulf	municipal, industrial	3	1	4	3	2	4	13.7	70	expansion of plant	L	8 million
Gulf of Heraklio	municipal, industrial	3	1	3	3	2	4	12.9	66	-	L	-
Elefsis bay	industrial,	3	1	2	1	3	6	12.6	65	industrial feasibility studies		0.6 million
North Western Saronic gulf	industrial,	3	1	2	1	2	5	11.2	57	industrial feasibility studies		0.3 million
Larymna bay	industrial	3	1	2	1	3	4	11.2	57	industrial feasibility studies		0.3 million
Nea Karvali bay	industrial	2	1	2	1	2	4	9.5	49	industrial feasibility studies		0.3 million

- Scattering of data does not provide a unified basis for data interpretation
- A degree of confidentiality has affected reliability of information on industrial effluents. Contacts with authorities and reviews of EIAs were needed to extract information on industrial effluents
- Basic assumptions used are given
- Costs of remedial action in industry refer to the necessary feasibility studies ($300,000/ Study)
- Costs for remedial actions for municipal discharges are those provided by authorities for ongoing construction programmes

Priority Pollution Hot Spots in Israel

Name	Type	Public Health	Drinking Water Quality	Aquatic Life	Recreation	Other beneficial use	Welfare and economy	Weighted total	Relative importance index	Nature of investment	Transboundary aspect(s)	Preliminary estimated financial requirement (in US$)
Haifa Bay	Mixed (ind. + river discharge)	6	1	6	6	6	6	24.9	100	WWTPs/WWTP upgrade	F,B,L,P,H	80 million + 650,000
Akko	Domestic	4	1	5	6	6	5	21.4	85.9	WWTP upgrade	F,B,L,P,H	10 million
Nahariya	Domestic	4	1	5	6	6	5	21.4	85.9	WWTP upgrade	F,B,L,P,H	18 million
Gush Dan (Tel-Aviv region) (Palmachain outfall)	Mixed (Sludge)	3	1	6	3	5	6	18.8	75.5	Option trials	F,B,L,P,H	prep. survey 700,000 + 90 million
Ashdod	Industrial	3	1	3	4	3	6	15.8	63.5	WWTP upgrade	F,B,L,P,H	20 million

- No information on quality of receiving waters
- Pollution loads estimated using total discharges and specific values of pollutants
- All cost estimates are preliminary and indicative; but considered reasonably accurate

Priority Pollution Hot Spots in Italy

Name	Type	Public Health	Drinking Water Quality	Aquatic Life	Recreation	Other beneficial use	Welfare and economy	Weighted total	Relative importance index	Nature of investment	Transboundary aspect(s)	Preliminary estimated financial requirement (in US$)
Genova	mixed	3	1	6	3	5	4	16.7	99	VTS-HAC/Delocali-zation/WWTP (Monitoring)	F-H-L	d = 10 million i = 80 million
La Spezia	mixed	3	1	6	3	4	3	16.0	90	VTS-HAC/Delocali-zation/WWTP (Energy/Power Station)	L-H-F	65 million
Livomo	ind.	3	1	6	2	3	4	15.2	99	VTS-HAC/Delocali-zation/WWTP (Monitoring)	F-H-L-B	n.a
Rosignano Solvay	Cl-NaOH, ethylene	4	1	6	3	3	2	15.6	99	BAT Chlorine/ Remedial on landfill	P-B-H-L	40 million
Golfo de Napoli	Port, refinery, domestic	3	1	4	4	3	5	15.9	78	VTS-HAC/WWTP	L-H-P	60 million
Milazzo	Port, refinery, domestic	3	1	6	3	3	4	16.0	85	VTS-HAC/ Delocali-zation/WWTP	P-F-H-L	45 million
Gela	Port, refinery, domestic	4	1	6	4	3	2	16.4	90	VTS-HAC/ Delocali-zation/WWTP	P-F-H-L	35 million
Augusta-Priolo-Melilli	Port, refinery, domestic	5	1	6	3	3	2	16.6	100	VTS-HAC/ Delocali-zation/BAT Chlorine/WWTP	P-F-H-L	70 million
Taranto	Port, refinery, domestic	5	1	6	2			15.8	94	VTS-HAC/WWTP	P-F-H-L	n.a
Brindisi	Port, refinery, domestic	5	1	6	2	4	2	16.5	96	VTS-HAC/ Delocalization inol/BAT Chlorine/WWTP	P-F-H-L	40 million
Bari-Bartetta	Domestic	6	3	3	2	2	2	15.5	75	WWTP	P-H-B	100 million

Priority Pollution Hot Spots in Italy *(Continued)*

Name	Type	Public Health	Drinking Water Quality	Aquatic Life	Recreation	Other beneficial use	Welfare and economy	Weighted total	Relative importance index	Nature of investment	Transboundary aspect(s)	Preliminary estimated financial requirement (in US$)
Manfredonia	Port, refinery, domestic	4	1	5	2	2	2	13.3	65	VTS-HAC/WWTP	H-B	25 million
Ancona-Falconara	Port, refinery	3	1	4	4	2	2	13.1	60	Monitoring	L-H	60 million
Ravenna	Port, refinery	3	1	6	2	4	4	15.9	90	Monitoring/ Delocalization	L-H-F	n.a
Porto Marghera (VE)	Port, ind. & dom	6	1	6	4	5	5	21.9	100	VTS-HAC/Monitoring/BAT CVM/BAT Chlorine	P-L-H-F-B	120 million

- Lack of data for some regions
- Many relevant authorities unwilling to provide information
- Parameters in the questionnaires are not measured systematically
- Conversion factors proposed by the National Council for Scientific Research (CNR, 1986) were used where no effluent data were not available from enterprises
- Typical costs of generic remedial actions provided, citing sources; but no estimates for each hot spot provided
- VTS-HAC : Vessel Traffic Service - Harbour Approach Control

Priority Pollution Hot Spots in Lebanon

Name	Type	Public Health	Drinking Water Quality	Aquatic Life	Recreation	Other beneficial use	Welfare and economy	Weighted total	Relative importance index	Nature of investment	Transboundary aspect(s)	Preliminary estimated financial requirement (in US$)
Greater Beirut area	municipal, industrial	6	1	5	6	4	3	20.6	100	WWTP-construction: primary (planned) & secondary (assumed)	L	140 million
Jounieh	municipal, industrial	4	1	5	5	5	5	19.9	97	WWTP-construction: primary (planned) & secondary (assumed)	L	62.6 million
Saida-Ghaziye	municipal, industrial	5	1	4	4	5	5	19.3	94	WWTP-construction: primary (planned) & secondary (assumed)	L	44 million
Tripoli	municipal	5	1	5	6	4	2	18.9	92	WWTP-construction: primary (planned) & secondary (assumed)	L,F	126.5 million
Batroun-Selaata	municipal, industrial	4	1	3	4	4	5	16.8	82	feasibility study (on-going) & secondary treatment (assumed)	L	5.9 million

- Lack of reliable systematic data for the last five years
- No actual measurements of effluents carried out as yet. Estimates of pollution loads from major industries are based on 1991 study by Bechtel
- Basic assumptions for estimating municipal discharges given
- METAP report figures used where none are available for industries discharging in the sewage network

Priority Pollution Hot Spots in Morocco

Name	Type	Public Health	Drinking Water Quality	Aquatic Life	Recreation	Other beneficial use	Welfare and economy	Weighted total	Relative importance index	Nature of investment	Transboundary aspect(s)	Preliminary estimated financial requirement (in US$)
Tangier	domestic + industrial	5	3	3	3	5	6	21	100	DWWTP (Construction) IWWTP (Construction)	F,H,B,L,P	28 million na
Tetouan	domestic + industrial	5	3	3	3	4	6	19	90.5	DWWTP (Construction) IWWTP (Construction)	F,H,B,L,P	19.6 million na
Nador	domestic + industrial	3	3	2	3	4	3	15	71,4	DWWTP (Construction) IWWTP (Construction)	F,H,B,L,P	na na

- No detailed measurements of industrial pollution loads available.
- Little cooperation from industry.
- Measurements of quality of receiving waters are beginning to yield results.
- Data used were compiled at different dates
- Basic assumptions of cost estimates of remedial actions for municipal wastewaters are given; but none for industry.

Priority Pollution Hot Spots in Slovenia

Name	Type	Public Health	Drinking Water Quality	Aquatic Life	Recreation	Other beneficial use	Welfare and economy	Weighted total	Relative importance index	Nature of investment	Transboundary aspect(s)	Preliminary estimated financial requirement (in US$)
Koper (Rizana river)	dom.+ ind.	3	1	5	5	4	5	18.2	100	WWTP extension + sewerage systems for Koper City	B, F, L, H	13 million + 62.5 million
Izola	dom.+ ind.	3	1	3	5	3	4	15.3	95	WWTP construction + sewerage system reconstruction	B, P, H	10 million + 2 million
Piran submarine outfall	domestic	2	1	3	4	2	1	10.7	90	WWTP extension + sewerage system reconstruction	B, F, H	6 million + 2.5 million
Delamaris	industrial	2	1	4	5	3	3	14.2	93	WWTP extension	L, F, H	2.0 million +0.5 million

- Quantities and compositions of wastewater discharged by various industries are unknown
- Estimates of costs of remedial actions for industrial wastewaters are difficult. The estimate for a national management plan is given. However, estimates for municipal wastewaters are given.

Priority Pollution Hot Spots in Spain

Name	Type	Public Health	Drinking Water Quality	Aquatic Life	Recreation	Other beneficial use	Welfare and economy	Weighted total	Relative importance index	Nature of investment	Transboundary aspect(s)	Preliminary estimated financial requirement (in US$)
Barcelona	Municipal	3	1	6	4	4	3	16.6				
Tarragona	Municipal	3	1	4	4	4	3	15.2				
Valencia	Municipal	2	1	4	4	4	3	14.2				
Cartegena	Domestic	3	1	3	3	3	3	13.6				
Algeciras	Domestic	2	1	4	3	3	3	12.6				

- No information on pollution loads, nature of investment, transboundary aspects and estimated financial requirement was provided.

Priority Pollution Hot Spots in Syria

Name	Type	Public Health	Drinking Water Quality	Aquatic Life	Recreation	Other beneficial use	Welfare and economy	Weighted total	Relative importance index	Nature of investment	Transboundary aspect(s)	Preliminary estimated financial requirement (in US$)
Tartous	municipal, industrial	5	4	5	5	5	5	23.6	100	WWTP- construction: secondary (planned)	L.F.B	41 million
Lattakia	municipal, industrial	6	4	5	5	4	3	22.5	95	WWTP- construction: secondary (planned)	L	73 million
Banias	municipal, industrial	3	4	4	4	4	6	20	85	WWTP- construction: secondary (suggested)	L	35.6 million
Jableh	municipal, industrial	4	4	3	4	3	5	18.8	80	WWTP- construction: secondary (planned)	L	41.7 million
										capacity building & industrial waste management plan		1.5 million

- Data collected in February, 1997
- Some estimates are based on per capita parameters
- WHO Reference Guide used to calculate industrial pollution

Priority Pollution Hot Spots in Tunisia

Name	Type	Public Health	Drinking Water Quality	Aquatic Life	Recreation	Other beneficial use	Welfare and economy	Weighted total	Relative importance index	Nature of investment	Transboundary aspect(s)	Preliminary estimated financial requirement (in US$)
Gabes	Municipal Industrial (ess. fertilizer production)	6	2	6	5	3	5	22.2	100	- WWTP (Extension) - Disposal area of Phosphogypsum	F,B,H,P,L	30 million 100 million
Lake of Tunis	Municipal Industrial (Textile,metal transformation, petroleum storage..)	5	2	6	5	3	6	21.2	95	WWTP (Extension + tertiary treatment) WWTP (Construction) Dredging of lake	F,P,H,B	5 million 10 million 50 million
Lake of Bizerte	Municipal Industrial	5	2	5	4	3	5	18.5	84	WWTP (Construction) WWPTP (Construction)	F,P,L,B,H	39 million 38 million
Sfax-South	Municipal Industrial (ess. Phosphatic fertilizer, sulphuric acid, phosphoric acid...)	6	1	5	2	3	5	18.1	82	WWTP (Extension + Rehabilitation) WWPTP (Construction) Treatment of exhaust gas	F,P,B,H	30 million (non-estimated : needs preliminary studies)

- Cost estimates for remedial actions are based on previous studies

Priority Pollution Hot Spots in Turkey

Name	Type	Public Health	Drinking Water Quality	Aquatic Life	Recreation	Other beneficial use	Welfare and economy	Weighted total	Relative importance index	Nature of investment	Transboundary aspect(s)	Preliminary estimated financial requirement (in US$)
IZMIR	DOMESTIC	6	2	6	6	6	6	25.8	100.0	WWTP	F,H,B,L,P	78.5 million
IZMIR	INDUSTRIAL	6	2	6	6	6	6	25.8	100.0	WWTPs	F,H,B,L,P	na
ICEL (City)	DOMESTIC	6	3	6	6	4	5	24.6	95.3	WWTP + sew ext	F,H,B,L,P	97 million
ICEL	INDUSTRIAL	5	4	6	6	4	5	24.5	95.0	WWTPs	F,H,B,L,P	na
ANTALYA	DOMESTIC	5	5	6	4	3	6	23.8	92.2	WWTP + sewerage	F,H,B,L,P	136 million
HATAY	INDUSTRIAL	6	2	6	5	4	6	23.6	91.5	WWTPs	F,H,B,L,P	na
ADANA	DOMESTIC	6	4	4	5	4	5	23.1	89.5	WWTP + sew ext	F,H,B,L,P	99.8 million
ADANA	INDUSTRIAL	4	5	4	4	4	5	21.2	82.2	WWTPs	F,H,B,L,P	na
TARSUS	DOMESTIC	5	4	5	3	4	5	21.3	82.6	WWTP + sew ext	F,H,B,L,P	76.4 million
ANTAKYA	DOMESTIC	5	4	5	4	3	4	20.7	80.2	WWTP + sew ext	F,H,B,L,P	79.7 million
ISKENDERUN	DOMESTIC	5	2	5	5	3	4	19.7	76.4	WWTP	F,H,B,L,P	13.4 million
KIRIKHAN	DOMESTIC	3	5	4	3	2	4	17.3	67.1	WWTP + sewerage	F,H,B,L,P	35.9 million
DORTYOL	DOMESTIC	3	4	4	3	3	4	17.1	66.3	WWTP + sewerage	F,H,B,L,P	41.7 million
ERDEMLI	DOMESTIC	3	4	4	3	3	4	17.1	66.3	WWTP + sewerage	F,H,B,L,P	52.2 million
SILIFKE	DOMESTIC	3	4	4	3	3	3	16.4	63.6	WWTP + sew ext	F,H,B,L,P	40.5 million
OSMANIYE	DOMESTIC	3	4	3	3	2	4	15.6	60.5	WWTP + sew ext	F,H,B,L,P	22.7 million

- Per capita parameters used in estimating loads of different pollutants
- Cost of remedial actions for municipal wastewaters are based on current cost figures and population served
- No cost estimates for industry could be made
- No information on quality of receiving waters

B. PRIORITY POLLUTION SENSITIVE AREAS

Priority Pollution Sensitive Areas in Albania

Name	Type	Public Health	Drinking Water Quality	Aquatic Life	Recreation	Other beneficial use	Welfare and economy	Weighted total	Relative importance index	Nature of investment	Transboundary aspect(s)	Preliminary estimated financial requirement (in US$)
Kuna - Vain lagoons	domestic industrial	2	1	4	1	1	2	7.7		WWTP + construction of a sewerage system with establishment of proper management	B, F	25 million 1 million
Karavasta lagoon	domestic	2	1	3	1	1	2	8.0		establishment of proper management with appropriate monitoring program	B, F	1-2 million
Narta lagoon	agriculture water extraction	2	1	2	1	1	2	7.3		dredging of outlet channel + establishment of proper management with appropriate monitoring program	B, F	3-5 million

Priority Pollution Sensitive Areas in Algeria

Name	Type	Public Health	Drinking Water Quality	Aquatic Life	Recreation	Other beneficial use	Welfare and economy	Weighted total	Relative importance index	Nature of investment(*)	Transboundary aspect(s)	Preliminary estimated financial requirement (in US$)
Gulf of Ghazaouet	domestic+ industrial	5	1	5	5	4	5	20.1	100	DWWTP (Construction) IWWTP (Construction)	F,B,L,P	na
Gulf of Arzew-Mostaganem	domestic+ industrial	5	1	5	5	4	4	19.4	96.5	DWWTP (Construction) IWWTP (Construction)	F,B,L,P,H	na
Bay of Algiers	domestic+ industrial	5	1	4	5	4	4	18.7	93	DWWTP (Construction) IWWTP (Construction)	F,B,L,P,H	na
Bay of Annaba	domestic+ industrial	5	1	5	4	4	4	18.6	92.5	DWWTP (Construction) IWWTP (Construction)	F,B,L,P,H	na
Gulf of Skikda	domestic+ industrial	4	1	5	4	4	4	17.6	87.56	DWWTP (Construction) IWWTP (Construction)	F,B,L,P,H	na
Bay of Bejaia	domestic+ industrial	4	1	4	4	4	4	16.9	84	DWWTP (Construction) IWWTP (Construction)	F,B,L,P	na

* The nature of the investment to protect sensitive areas concerns reorganization of existing treatment plants or the building of new plants to treat urban and industrial wastewater from the majority of population centres and industrial plants situated in the area, including those relevant to the pollution hot spots.

** The financial estimate depends on the nature of the investment to be determined for each specific area (number of population centres and industries).

DWWTP: Domestic wastewater treatment plant
IWWTP: Pretreatment of industrial effluents

Priority Pollution Sensitive Areas in Croatia

Name	Type	Public Health	Drinking Water Quality	Aquatic Life	Recreation	Other beneficial use	Welfare and economy	Weighted total	Relative importance index	Nature of investment	Transboundary aspect(s)	Preliminary estimated financial requirement (in US$)
Malostonski	domestic industr.	2	1	2	2	2	2	8.9		Management plan and monitoring programme	L,P	1.2 million
Limski ch.	industr.	2	1	2	2	2	2	8.9		Management plan and monitoring programme	L,P	700,000
Kornati	pleasure boats tourism	1	1	2	2	1	1	6.4		Management plan and monitoring programme	L	900,000
Mljet	pleasure boats domestic	2	1	2	2	1	1	7.4		Management plan and monitoring programme	L	200,000
Krka est.	domestic industr.	4	1	2	2	2	4	12.3		Management plan and monitoring programme	P,L	1.5 million

Priority Pollution Sensitive Areas in Cyprus

Sensitive area	Main sources of pollution	Principal supporting data
VASSILIKOS BAY	Cement factory - dust Vassiliko port: Dust (Cement) during loading operation. Operation of C.C.F industries 1987 - 1990. This chemical complex stopped operating since 1990. During its operations large amount of metal like Cu, Zn, Fe, Cd have been entered the bay. The construction of a new power station of 360 MW capacity	The effects of pollution to marine communities were severe up to 50 metres depth. - Ecological study on Marine communities and ecosystems in relation to the Pollution effect from the CCF industries by M. Hadjichristophorou, Fisheries Officer, 1991. The sea bottom of the east area of the bay to a great extent has been contaminated with metals Fe, Cu, Zn as a result of the coastal activities of the CCF industries and cement factory. - Contamination of Vassilikos bay with metals, S. Varnavas University of Patras, 2nd Symposium of Environmental Science and Technology - Mytiline Sept. 1991

Priority Pollution Sensitive Areas in Egypt

Name	
Lake Bardawil	Lake of Bardawil on the coast of Sinai is a source of high value aquatic resources that has one outlet to the Mediterranean. It has been reasonably well protected so far. It is close to a natural reserve frequented by birds on their annual migrations from North to South and back. Ongoing and planned development projects in North Sinai could easily become a serious cause for irretrievable degradation of this valuable resource.

[1]Priority Pollution Sensitive Areas in France

French Litoral Zone Numbers	Designation and Class under SDAGE Study Typology	Main Resources at Risk	Main Risks and Risky Factors
2	COLLIOURE-CAP LEUCATE	Firheries spawning and growing areas High fishing resources Natural shellfish sites Posidonia Protected area at the mouth of Tech river	Eutrophication (from small rivers of mediocre quality) Toxic phytoplankton Marinas: 5 775 boat sites
7 to 10	CAP LEUCATE - L'ESPIGUETE	Firheries spawning and growing areas High fishing resources Natural and aquatic shellfish sites sites, some very large Zostera Tourism, beaches	Accidental pollution, pollution from rivers. Some pesticides and tributyltin Contamination from treated urban effluent Envisaged modification (from small river to sea outfall) of discharge point for Montpellier treated sewage
16	RHONE MOUTH - FOS GULF	Firheries spawning and growing areas, exchange of juveniles with Etang de Berre Posidonia, Zostera RAMSAR Zone	Eutrophication Rhone-carried pollution loads Bacterial contamination if shellfish Accidental marine pollution Inavigation, harbour activity) Marinas 550 boat sites

[1] No prioritisation was attempted amongst the identified sensitive areas. The sensitive areas selected here are those categorised as in the highest risk class amongst the 50 homogenous zones in which the French Coast is divided.

Priority Pollution Sensitive Areas in Greece

Name	Type	Public Health	Drinking Water Quality	Aquatic Life	Recreation	Other beneficial use	Welfare and economy	Weighted total	Relative importance index	Nature of investment	Transboundary aspect(s)	Preliminary estimated financial requirement (in US$)
Amvrakikos gulf	municipal, agricultural	2	1	2	2	2	2	8.9	46	treatment plant & outfall	L	11 million
Lagoon of Mesologgi	municipal	1	1	1	1	2	2	6.3	32	capacity building/ monitoring		1 million

Priority Pollution Sensitive Areas in Italy

Name	Type	Public Health	Drinking Water Quality	Aquatic Life	Recreation	Other beneficial use	Welfare and economy	Weighted total	Relative importance index	Nature of investment	Transboundary aspect(s)	Preliminary estimated financial requirement (in US$)
Vado Ligure-Savona	Power plant, industry, domestic	2	1	5	4	3	4	15.0	95	WWTP reconstruction/ VTS HAC/Monitoring	B,F,H	8 million
Secche della Meloria	Power plant, industry, domestic	2	1	6	3	2	3	13.6	98	SPA integral conservation	B-F-H	2 million
Isola d'Elba	Power plant, industry, domestic	2	1	5	6	5	6	19.4	90	Mointoring/ WWTP/ Treatment for emission from steal industry	B-F-L-H	10 million
Pesaro -Cervia	Domestic Seasonal	4	1	2	5	3	6	16.8	90	WWTP in summer/ Po sediment prevention	L-H-F	10 million
Mouth Po	Power plant, industry, domestic	3	1	6	4	3	4	16.8	100	Delocalization pig farming/ WWTP upstream/ Monitoring	P-H-B-L	30 million
Venezia and its lagoon	Power plant, industry, domestic	5	1	6	4	5	4	21.2	100	Delocalization CFM/WWTP	P-H-B-L	20 million
Panzano Bay	Mercury and Cl-NaOH, oil	4	1	5	3	6	5	19.0	90	BAT for chlorine alkali industry/ WWTP		5 million

Priority Pollution Sensitive Areas in Lebanon

Name	Type	Public Health	Drinking Water Quality	Aquatic Life	Recreation	Other beneficial use	Welfare and economy	Weighted total	Relative importance index	Nature of investment	Transboundary aspect(s)	Preliminary estimated financial requirement (in US$)
Sour	municipal,	4	1	4	2	3	2	13.2	64	WWTP-construction: secondary (planned)	L	19 million
Jbail (Byblos)	municipal, industrial	2	1	4	3	2	3	12	58	feasibility study (on-going) & secondary treatment (assumed)	L	7.5 million
										capacity building & ind.waste masterplan		3 million

Priority Pollution Sensitive Areas in Malta

Sensitive Areas	Reason for intervention	Estimated Costs (in US$)
Wied Ghammieq	Construction of a new wastewater treatment plant together with an extension of another wastewater treatment plant (already existing at San Antnin)	Total cost: 36 million
Ic-Cumnija	Construction of a new wastewater treatment plant	Total cost: 8 million
Ras il-Hobz	Construction of a new wastewater treatment plant	Total cost: 4 million

Note: The above sensitive areas represent groups of smaller sensitive areas and they coincide with the pollution hot spots.

Priority Pollution Sensitive Areas in Morocco

Name	Type	Public Health	Drinking Water Quality	Aquatic Life	Recreation	Other beneficial use	Welfare and economy	Weighted total	Relative importance index	Nature of investment	Transboundary aspect(s)	Preliminary estimated financial requirement (in US$)
Al-Hoseima	dom. + ind.	3	2	3	2	3	3	13	61.9	DWWTP (Construction) IWWTP (Construction)	P,H,B,L,P	6 million na

Priority Pollution Sensitive Areas in Slovenia

Name	Type	Public Health	Drinking Water Quality	Aquatic Life	Recreation	Other beneficial use	Welfare and economy	Weighted total	Relative importance index	Nature of investment	Transboundary aspect(s)	Preliminary estimated financial requirement (in US$)
Koper Bay	dom. + ind.	3	1	5	5	4	5	18.2		See Rizana river	P,B,F,L,H	See Rizana river
Piran Bay	domestic	2	1	3	4	2	1	10.7		See Piran	B,F,H	See Piran

Priority Pollution Sensitive Areas in Spain

RANKING OF SENSITIVE AREAS	
1.	Albufera de Valencia
2.	Delta del Ebro
3.	Mar Menor

Priority Pollution Sensitive Areas in Syria

Rank	Sensitive area	Protective measures
1	Umit Tiur	management plan for touristic activities, removal of illegal buildings
2	Arwad island	rehabilitation plan, prohibition - control of illegal fishing, preservation of submarine life
3	Wadi Qandeel	characterization as specially protected area, suitable for passive recreation only (bathing, sightseeing boat tours)
4	Lattakia beach (southeast)	protection from urban development, prohibition of excavations, designation as public beach
5	Rasl Fassouri	management plan for touristic activities, restoration of surrounding environment

Priority Pollution Sensitive Areas in Tunisia

Name	Type	Public Health	Drinking Water Quality	Aquatic Life	Recreation	Other beneficial use	Welfare and economy	Weighted total	Relative importance index	Nature of investment	Transboundary aspect(s)	Preliminary estimated financial requirement (in US$)
Ghar El Melh	Domestic+ Industrial	4	1	6	3	4	4	17.7	100	WWTP (Construction) Recirculation canal : Construction	F,B,P,H,L	4 million

Priority Pollution Sensitive Areas in Turkey

RANK	NAME	CONSERVATION MEASURES	REMARKS
1	* Adana Seyhan River mouth Ceyhan River mouth	Monitoring programme and management plan	Heavy pollution load discharged into the Mediterranean Sea
2	* Izmir Bay Bakirçay River mouth Gediz River mouth Küçük Menderes River mouth	Monitoring programme and management plan	Heavy pollution load discharged into the Aegean Sea
3	* Içel Göksu River mouth Lamas River mouth Tarsus River mouth	Monitoring programme and management plan	Heavy pollution load discharged into the Mediterranean Sea
4	Mersin-Kazanli	Coastal zone management and wastewater Treatment	Marine pollution, coastal erosion and breeding dunes for *Chelonia mydas* and *Caretta caretta*
5	Hatay-Samandag	Monitoring and coastal zone management	Transboundary marine pollution, especially solid waste, endangered species
6	* Aydin Büyük River mouth * Mugla Dalaman Stream mouth	Monitoring and pollution prevention and control programme for dumping from ships	Heavy pollution load discharged into the Aegean Sea

Annex III

Summary Tables

Table III-1:

List of hot spots in descending order by country

Table III-2:

Population and main pollution loads (BOD, COD, N_T, P_T, TSS) for each hot spot by country

Table III-3:

TPB Discharges (Hg, Cd, Pb, Cr, Cu, Zn, Ni, POPs, others by country

Table III-4:

Priority Pollution Sensitive Areas by country

Table III-1 PRIORITY HOTS SPOTS

(ranked in descending order by country)

Country	Hot Spot	Source of pollution	Weighted Total Impact	Economic Costs for Remedial Actions (Mln US$)
Albania	Durres	d	13.3	48
Albania	Vlore	d	13.3	48
Albania	Durres (Chemical factory)	i	11.4	2 to 3
Albania	Vlore (PVC Factory)	i	9.3	2
Algeria	Oran Ville	m	21.0	35+
Algeria	Rouiba	m	21.0	2+
Algeria	Ghazaouet	m	20.8	30+
Algeria	Alger	m	20.2	1.5+
Algeria	Mostaganem	m	20.0	25+
Algeria	Bejaia	m	19.4	0.9+
Algeria	Annaba	m	18.7	0.6+
Algeria	Skikda	m	17.8	20+
Bosnia and Herzegovina	Neum	d	n.a	25
Croatia	Kastela Bay	m	21.7	*See Split*
Croatia	Split	m	21.1	66
Croatia	Sibenik	m	18.8	30
Croatia	Zadar	m	18.5	35
Croatia	Pula	m	17.5	30
Croatia	Rijeka (Oil Refinery)	i	16.9	8
Croatia	Kastela Bay (Kaltenberg)	i	16.0	2
Croatia	Zadar (Adria)	i	15.9	2
Croatia	Rijeka	d	15.2	25
Croatia	Bakar (ex Cokery)	i	15.2	1.5
Croatia	Dubrovnik	d	14.5	6
Croatia	Zadar (Tannery)	i	12.1	1.5
Cyprus	Limassol	m	13.0	32.75
Cyprus	Larnaca	m	11.9	0.5
Cyprus	Larnaca	i	8.1	1
Cyprus	Dhekelia (Desalination Plant)	i	7.5	na
Egypt	El-Manzala	m	26.1	na
Egypt	Abu-Qir Bay	m	24.9	101.2+
Egypt	El-Mex Bay	m	19.1	61.6
Egypt	Alexandria	d	17.8	in implementation
France	Marseille	d	11.9	110
France	Gardanne	i	10.9	na

d=domestic i=industrial m=mixed na=not available

Country	Hot Spot	Source of pollution	Weighted Total Impact	Economic Costs for Remedial Actions (Mln US$)
France	Toulon	d	10.4	40
France	Cannes	d	10.4	32
France	Frejus	d	10.4	18
Greece	Thermaikos Gulf	m	19.5	40.6
Greece	Inner Saronic Gulf	m	18.8	130
Greece	Patraikos Gulf	m	17.9	15
Greece	Pagasitikos Gulf	m	13.7	8
Greece	Heraklio Gulf	m	12.9	na
Greece	Elefsis Bay	i	12.6	0.6
Greece	NW Saronic Gulf	i	11.2	0.3
Greece	Larymna Bay	i	11.2	0.3
Greece	Nea Karvali Bay	i	9.5	0.3
Israel	Haifa Bay	m	24.9	80 + 0.65
Israel	Nahariya	d	21.4	18
Israel	Akko	d	21.4	10
Israel	Gush Dan	m	18.8	0.7
Israel	Ashdod	i	15.8	20
Israel	Haifa Bay	i	13.8	0.45
Italy	Porto Marghera (VE)	m	21.9	120
Italy	Genova	m	16.7	d=10 i=80
Italy	Augusta-Melilli	m	16.6	70
Italy	Brindisi	m	16.5	40
Italy	Gela	m	16.4	35
Italy	La Spezia	m	16.0	65
Italy	Milazzo	m	16.0	45
Italy	Golfo di Napoli	m	15.9	60
Italy	Ravenna	i	15.9	na
Italy	Taranto	m	15.8	na
Italy	Rosignano Solvay	i	15.6	40
Italy	Bari-Barletta	d	15.5	100
Italy	Livorno	i	15.2	na
Italy	Manfredonia	m	13.3	25
Italy	Ancona-Falc	i	13.1	60
Lebanon	Gt Beirut Area	m	20.6	140
Lebanon	Jounieh	m	19.9	62.6
Lebanon	Saida-Ghaziye	m	19.3	44
Lebanon	Tripoli	m	18.9	126.5
Lebanon	Batroun Selaata	m	16.8	5.9
Libya	Zanzur	i	17.0	0.1
Libya	Tripoli	d	15.3	12
Libya	Benghazi	d	13.8	1
Libya	Zawwia	d	12.0	2

d=domestic i=industrial m=mixed na=not available

Country	Hot Spot	Source of pollution	Weighted Total Impact	Economic Costs for Remedial Actions (Mln US$)
Libya	Tobruk	d	12.0	1.5
Malta	Weid Ghammieq	m	21.9	36
Malta	Cumnija	m	18.1	8
Malta	Ras il-Hobz	m	17.9	4
Morocco	Tangier	m	21.0	28+
Morocco	Tetouan	m	19.0	19.6+
Morocco	Nador	m	15.0	na
Slovenia	Koper (incl. Rizana river)	m	18.2	16
Slovenia	Izola	m	15.3	12
Slovenia	Delamaris	i	14.2	2.5
Slovenia	Piran Submarine Outfall	d	10.7	8.5
Spain	Barcelona	m	16.6	na
Spain	Tarragona	m	15.2	na
Spain	Valencia	m	14.2	na
Spain	Cartegena	d	13.6	na
Spain	Algeciras	d	12.6	na
Syria	Tartous	m	23.6	41
Syria	Lattakia	m	22.5	73
Syria	Banias	m	20.0	35.6
Syria	Jableh	m	18.8	41.7
Tunisia	Gabes	m	22.2	132.5
Tunisia	Lake of Tunis	i	21.2	55
Tunisia	Lake of Bizerte	i	18.5	77
Tunisia	Sfax-South	i	18.1	30+
Turkey	Izmir	m	25.8	78.5+
Turkey	Icel City	m	24.6	97
Turkey	Antalya	d	23.8	136
Turkey	Hatay	i	23.6	na
Turkey	Adana	d	23.1	99.8
Turkey	Tarsus	d	21.3	76.4
Turkey	Adana	i	21.2	na
Turkey	Iskenderun	d	19.7	13.4
Turkey	Kirikhan	d	17.3	35.9
Turkey	Dortyol	d	17.1	41.7
Turkey	Erdemli	d	17.1	52.2
Turkey	Silifke	d	16.4	40.5
Turkey	Osmaniye	d	15.6	22.7

d=domestic i=industrial m=mixed na=not available

Table III-2 MAIN POLLUTION LOADS

Country	Hot Spot	Population	BOD t/yr	COD t/yr	Total-N t/yr	Total-P t/yr	TSS t/yr
Albania	Durres	120,000	2,864	-	477	96	4,300
Albania	Vlore	110,000	2,628	-	438	88	3,942
Albania	Vlore (PVC Factory)	-	-	-	-	-	-
Algeria	Oran Ville	1,230,000	269	449	67	27	162
Algeria	Rouiba	120,000	72	106	56	16	75
Algeria	Ghazaouet	535,000	117	195	29	12	87
Algeria	Alger	1,957,334	429	714	107	43	227
Algeria	Mostaganem	631,000	138	230	35	14	57
Algeria	Bejaia	859,000	188	314	47	19	33
Algeria	Annaba	890,000	195	325	49	19	122
Algeria	Skikda	747,000	164	273	41	16	98
Bosnia and Herzegovina	Neum	-	-	-	-	-	-
Croatia	Kastela Bay	See Split	5,006	11,095	594	129	8,481
Croatia	Split	350,000+	1,643	3,286	411	115	1,232
Croatia	Sibenik	60,000+	201	410	89	20	240
Croatia	Zadar	85,000+	1,056	3,940	154	26	1,410
Croatia	Pula	63,979+	329	513	-	4	259
Croatia	Rijeka (Oil Refinery)	-	32	121	-	-	25
Croatia	Kastela Bay (Kaltenberg)	-	35	1,287	6	2	149
Croatia	Zadar (Adria)	-	67	121	2	1	18
Croatia	Rijeka	206,229+	1,927	4,614	201	33	1,728
Croatia	Bakar (ex Cokery)	-	-	-	-	-	-
Croatia	Dubrovnik	50,000+	160	310	79	19	139
Croatia	Zadar (Tannery)	-	23	68	5	0	15
Cyprus	Limassol	130,000	1,181	2,185	39	15	336
Egypt	El-Manzala	-	-	-	-	-	-
Egypt	Abu-Qir Bay	-	91,701	575,490	4,966	8,248	120,035
Egypt	El-Mex Bay	-	219,498	175,654	2,081	2,628	286,645
Egypt	Alexandria	4,000,000	1,632	-	1,520	2,266	8,831
France	Marseille	900,000	13,700	24,800	4,700	300	3,100
France	Gardanne	-	-	-	-	-	31,600
France	Toulon	310,000	1,300	5,000	1,500	150	1,000
France	Cannes	144,000	1,900	3,800	600	150	1,000
France	Frejus	175,000	650	1,700	400	40	400
Greece	Thermaikos Gulf		297	1,043	-	15	142
Greece	Inner Saronic Gulf	3,345,000	59,386	118,735	-	-	42,815
Greece	Patraikos Gulf	155,180	127	473	110	29	110
Greece	Pagasitikos Gulf	77,907	657	1,095	-	-	-
Greece	Heraklio Gulf	117,167	84	141	-	-	29
Greece	Elefsis Bay	-	61	446	-	-	70
Greece	NW Saronic Gulf	-	22	22	-	-	5
Greece	Larymna Bay	-	-	7,516	-	-	2,505
Greece	Nea Karvali Bay	-	295	739	625	126	-

Blank cells mean no information available.
+ signs after figures mean more input, not quantified

Country	Hot Spot	Population	BOD t/yr	COD t/yr	Total-N t/yr	Total-P t/yr	TSS t/yr
Israel	Haifa Bay	-	28,940	183,770	11,055	1,272	6,800
Israel	Haifa Bay (industrial)	-	800	-	-	-	1,400
Israel	Naharaiya	37,500	2,900	6,200	122	86	2,250
Israel	Akko	46,000	2,000	4,400	330	53	2,200
Israel	Gush Dan	1,100,000	-	-	2,900	1,200	44,000
Israel	Ashdod	-	2,630	12,150	600	7	258
Italy	Porto Marghera (VE)	309,422	9,988	39,953	3,746	2,497	19,977
Italy	Genova	678,771	15,796	63,184	5,923	3,949	31,592
Italy	Augusta-Melilli-Priolo	57,311	1,808	7,232	678	452	3,616
Italy	Brindisi	95,383	2,077	8,308	779	519	4,154
Italy	Gela	72,535	2,144	8,578	804	536	4,289
Italy	La Spezia	101,422	3,949	15,796	1,450	940	7,346
Italy	Milazzo	31,541	616	2,464	231	154	1,232
Italy	Golfo di Napoli	1,540,814	16,251	65,005	6,094	4,063	32,502
Italy	Ravenna	135,844	6,363	25,453	2,386	1,591	12,727
Italy	Taranto	232,334	2,484	9,937	932	621	4,968
Italy	Rosignano Solvay (Marritimo)	30,021	187	747	70	47	373
Italy	Bari-Barletta (Global)	1,200,000	7,707	30,827	2,890	1,927	15,413
Italy	Livorno	167,512	2,698	10,792	1,012	674	5,396
Italy	Manfredonia	58,318	1,272	5,087	477	318	2,543
Italy	Ancona-Falc	101,285 + 30,105	2,990	11,959	1,121	747	5,979
Lebanon	Gt Beirut Area	-	29,235	-	-	-	14
Lebanon	Jounieh	200,000	4,280	-	-	-	80
Lebanon	Saida-Ghaziye	205,000	5,134	-	-	-	293
Lebanon	Tripoli	353,000	7,446	-	-	-	-
Lebanon	Batroun Selaata	51,000	1,077+	-	-	-	-
Libya	Zanzur	-	-	-	-	-	-
Libya	Tripoli	1,200,000	3,100	4,650	740	-	4,300
Libya	Benghazi	750,000	2	2,100	306	-	1,226
Libya	Zawwia	-	-	-	-	-	-
Libya	Tobruk	-	-	-	-	-	-
Malta	Weid Ghammieq	270,085	10,250	16,021	1,411	1,082	12,819
Malta	Cumnija	59,224	2,412	3,599	201	149	2,638
Malta	Ras il-Hobz	25,957	1,273	3,318	206	160	2,053
Morocco	Tangier	526,215	9,401	22,076	928	150	9,651
Morocco	Tetouan	367,349	6,861	15,304	723	114	7,143
Morocco	Nador	246,113	1,888	4,435	83	100	1,433
Slovenia	Koper (incl. Rizana River)	46,221	485	5,111	76	8	250
Slovenia	Izola	13,770	1,092	-	90	21	414
Slovenia	Delamaris	(See Izola)					
Slovenia	Piran Submarine Outfall	17,000	125	290	23	26	116

Blank cells mean no information available.
+ signs after figures mean more input, not quantified

Country	Hot Spot	Population	BOD t/yr	COD t/yr	Total-N t/yr	Total-P t/yr	TSS t/yr
Spain	Barcelona	4,680,000	-	-	-	-	-
Spain	Tarragona	110,000	-	-	-	-	-
Spain	Valencia	2,143,000	-	-	-	-	-
Spain	Cartagena	168,000	-	-	-	-	-
Spain	Algeciras	85,000	-	-	-	-	-
Syria	Tartous	319,152	18.5+	-	73.5+	34.3+	-
Syria	Lattakia	746,851	530	-	-	-	168
Syria	Banias	142,564	163	316	-	-	-
Syria	Jableh	166,779	542	-	-	-	225
Tunisia	Gabes	150,000	1,732	-	320	724	4,860
Tunisia	Lake of Tunis	400,000	2,243	4,384	300	26	1,210
Tunisia	Lake of Bizerte	250,000	2,687	-	476	118	2,329
Tunisia	Sfax-South	395,277	843	1,900	100	40	345
Turkey	Izmir	2,017,711	44,188	73,647	11,047	4,419	66,285
Turkey	Icel City	694,867	15,218	25,363	3,804	1,522	22,830
Turkey	Antalya	505,862	11,078	18,463	2,769	1,108	16,620
Turkey	Adana	1,066,005	23,346	38,910	5,837	2,335	35,025
Turkey	Tarsus	333,302	7,299	12,165	1,825	730	10,950
Turkey	Antakya	317,725	6,958	11,597	1,740	696	10,440
Turkey	Iskenderun	276,163	10,047	222,080	115,512	76,005	9,075+
Turkey	Kirikhan	120,472	2,638	4,397	660	264	3,960
Turkey	Dortyol	116,380	2,549	4,248	637	225	3,825
Turkey	Erdemli	108,927	2,386	3,977	597	239	3,585
Turkey	Silifke	128,509	9,084	100,290	57,604	38,481	4,215
Turkey	Osmaniye	139,116	3,047	5,078	761	305	4,575

Blank cells mean no information available.
+ signs after figures mean more input, not quantified

Table III-3 TPB DISCHARGES

Country	Hot Spot	Hg kg/yr	Cd kg/yr	Pb kg/yr	Cr kg/yr	Cu kg/yr	Zn kg/yr	Ni kg/yr	POPs	Other
Albania	Durres	-	-	-	-	-	-	-	-	-
Albania	Vlore	-	-	-	-	-	-	-	Lindane (1.7 micro g/kg) DDT (5.4 micro g/kg)	-
Albania	Durres (ex Chem Factory)	-	-	-	-	-	-	-	-	-
Albania	Vlore (PVC factory)	-	-	-	-	-	-	-	-	-
Algeria	Oran Ville	-	-	-	-	-	-	-	-	-
Algeria	Rouiba	-	-	-	-	-	-	-	-	-
Algeria	Ghazaouet	-	-	-	-	-	-	-	-	-
Algeria	Alger	-	-	-	-	-	-	-	-	-
Algeria	Mostaganem	-	-	-	-	-	-	-	-	-
Algeria	Bejaia	-	-	-	-	-	-	-	-	-
Algeria	Annaba	-	-	-	-	-	-	-	-	-
Algeria	Skikda	-	-	-	-	-	-	-	-	-
Bosnia and Herzegovina	Neum	-	-	-	-	-	-	-	-	-
Croatia	Kastela Bay	-	23.3	555.1	-	-	3,499	-	-	-
Croatia	Split (See Kastela Bay)	-	-	-	-	-	-	-	-	-
Croatia	Sibenik	-	75	315	-	-	179	-	-	-
Croatia	Zadar	-	23	358	-	-	726	-	-	-
Croatia	Pula	-	0.4	11	-	-	279	-	-	Oil (8.4 t/yr)
Croatia	Rijeka (Oil refinery)	-	-	-	-	-	-	-	-	Oil (8.09 t/yr) Phenols (172 kg/yr)
Croatia	Kastela Bay (Kaltenberg)	-	-	-	-	-	-	-	-	
Croatia	Zadar (Adria)	-	-	-	-	-	-	-	-	-

Blank cells mean no information available

Country	Hot Spot	Hg kg/yr	Cd kg/yr	Pb kg/yr	Cr kg/yr	Cu kg/yr	Zn kg/yr	Ni kg/yr	POPs	Other
Croatia	Rijeka	-	146	150	-	-	1,420	-	-	
Croatia	Bakar (ex Cokery)	-	-	-	-	-	-	-	-	Phenols 100 Kg Cyanides 600 Kg
Croatia	Dubrovnik	-	5.5	1,916	-	-	151	-	-	-
Croatia	Zadar (Tannery)	10.1	-	3.2	3,932	-	-	-	-	Oil (0.113 t/yr)
Cyprus	Limassol	-	-	-	-	-	-	-	-	-
Cyprus	Larnaca	-	-	-	-	-	-	-	-	-
Cyprus	Larnaca	5 (micro g/L)	-	0.4 (micro g/L)	-	80 (micro g/L)	75 (micro g/L)	-	-	Oil (0.018 t/yr)
Egypt	El-Manzala	-	-	-	-	-		-	-	-
Egypt	Abu-Qir Bay	-	31+	193+	362+	2,669+	3,394+	859	-	Oil (1,906 t/yr)
Egypt	El-Mex Bay	1,278	1,562	-	530	25,430	46,524	-	-	Oil (1,319 t/yr)
Egypt	Alexandria	-	-	-	-	-	-	-	-	-
France	Marseille	-	-	-	-	-	-	-	-	-
France	Gardanne	-	-	-	-	-	-	-	-	-
France	Toulon	-	-	-	-	-	-	-	-	-
France	Cannes	-	-	-	-	-	-	-	-	-
France	Frejus									
Greece	Thermaikos Gulf	-	-	-	-	-	-	-	-	Oil (38 t/yr)
Greece	Inner Saronic Gulf	-	-	-	-	-	-	-	-	-
Greece	Patraikos Gulf	-	-	-	-	-	-	-	-	Oil (18.2 t/yr)
Greece	Pagasitikos Gulf	-	-	-	-	-	-	-	-	-
Greece	Heraklio Gulf	-	-	-	-	-	-	-	-	-
Greece	Elefsis Bay	-	-	-	-	-	-	-	-	Oil (17 t/yr)
Greece	NW Saronic Gulf	-	-	-	-	-	-	-	-	Oil (5.4 t/yr)
Greece	Larymna Bay	-	-	-	-	-	313,170	-	-	Oil (940 t/yr)
Greece	Nea Karvali Bay	-	-	-	-	-	2,586	-	-	-
Israel	Haifa Bay	-	2,600	-	-	3,250	58,500	-	-	Oil (50,000 t/yr)
Israel	Naharaiya	-	-	-	-	-	-	-	-	-
Israel	Akko	-	-	-	-	-	-	-	-	-
Israel	Gush Dan	60	430	1,670	11,400	19,000	54,000	2,500	-	-

Blank cells mean no information available

Country	Hot Spot	Hg kg/yr	Cd kg/yr	Pb kg/yr	Cr kg/yr	Cu kg/yr	Zn kg/yr	Ni kg/yr	POPs	Other
Israel	Ashdod	-	-	-	-	-	-	-	Herbicide (140 t/yr) Phenols (16 t/yr)	Oil (11 t/yr)
Israel	Haifa Bay (Industrial)	68	-	-	-	-	-	-	-	-
Italy	Porto Marghera	-	-	-	-	-	-	-	-	-
Italy	Genova	-	-	-	-	-	-	-	-	-
Italy	Augusta-Melilli	-	-	-	-	-	-	-	-	-
Italy	Brindisi	-	-	-	-	-	-	-	-	-
Italy	Gela	-	-	-	-	-	-	-	-	-
Italy	La Spezia	-	-	-	-	-	-	-	-	-
Italy	Milazzo	-	-	-	-	-	-	-	-	-
Italy	Golfo di Napoli	-	-	-	-	-	-	-	-	-
Italy	Ravenna	-	-	-	-	-	-	-	-	-
Italy	Taranto	-	-	-	-	-	-	-	8,000	-
Italy	Rosignano Solvay	-	-	-	-	-	-	-	-	-
Italy	Bari-Barletta	-	-	-	-	-	-	-	-	-
Italy	Livorno	-	-	-	-	-	-	-	-	
Italy	Manfredonia	-	-	-	-	-	-	-	-	-
Italy	Ancona-Falc	-	-	-	-	-	-	-	-	
Lebanon	Gt Beirut Area	-	-	-	-	-	-	-	-	-
Lebanon	Jounieh	-	-	-	-	-	-	-	-	-
Lebanon	Saida-Ghaziye	-	-	-	-	-	-	-	-	-
Lebanon	Tripoli	-	-	-	-	-	-	-	-	-
Lebanon	Batroun Selaata	-	-	-	-	-	-	-	-	-
Libya	Zanzur	-	-	-	-	-	-	-	-	-
Libya	Tripoli	-	-	0.088 (ppm)	0.038 (ppm)	-	-	-	-	-
Libya	Benghazi	-	-	-	-	-	-	-	-	-
Libya	Zawwia	-	-	-	-	-	-	-	-	-
Libya	Tobruk	-	-	-	-	-	-	-	-	-
Malta	Weid Ghammieq	-	-	-	-	-	-	-	-	-

Blank cells mean no information available

Country	Hot Spot	Hg kg/yr	Cd kg/yr	Pb kg/yr	Cr kg/yr	Cu kg/yr	Zn kg/yr	Ni kg/yr	POPs	Other
Malta	Cumnija	-	-	-	-	-	-	-	-	-
Malta	Ras il-Hobz	-	-	-	-	-	-	-	-	-
Morocco	Tangier	-	-	-	-	-	-	-	-	-
Morocco	Tetouan	0.38	14.66	307.59	75.75	572.23	1,379	-	-	-
Morocco	Nador	-	-	-	-	-	-	-	-	-
Slovenia	Koper (Incl. Rizana River)	-	752	5,727	2,778	1,767	48,806	2,807	-	-
Slovenia	Izola (with Delamaris)	-	9.3	90.5	28.9	43.4	483.3	18.3	-	-
Slovenia	Delamaris (see Izola)	-	-	-	-	-	-	-	-	-
Slovenia	Piran	-	4.26	60.96	8.43	27.26	703	9.8	-	-
Spain	Barcelona	-	-	-	-	-	-	-	-	-
Spain	Tarragona	-	-	-	-	-	-	-	-	-
Spain	Valencia	-	-	-	-	-	-	-	-	-
Spain	Cartagena	-	-	-	-	-	-	-	-	-
Spain	Algeciras	-	-	-	-	-	-	-	-	-
Syria	Tartous	-	54	2,703	1,784	5,406	5,163	2,649	-	-
Syria	Lattakia	-	85.4	4,271	2,135	4,271	7,687	2,562	-	-
Syria	Banias	-	-	-	-	-	-	-	-	Oil (438 t/yr)
Syria	Jableh	-	-	-	-	-	-	-	-	-
Tunisia	Gabes	-	13.6	80+ (ppm)	36.2	-	91.6+	-	-	-
Tunisia	Lake of Tunis	-	0.15	0.6	70	23.4	11.3	4.4	-	-
Tunisia	Lake of Bizerte	-	-	100 (ppm)	120 (ppm)	70 (ppm)	300 (ppm)	-	-	-
Tunisia	Sfax-South	-	-	-	-	3,456	17,000	-	-	-
Turkey	Izmir	-	-	-	-	-	-	-	-	-
Turkey	Icel City	-	-	-	-	-	-	-	-	-
Turkey	Antalya	-	-	-	-	-	-	-	-	-
Turkey	Hatay	-	-	-	-	-	-	-	-	-
Turkey	Adana	-	-	-	-	-	-	-	-	-
Turkey	Tarsus	-	-	-	-	-	-	-	-	-
Turkey	Antalya	-	-	-	-	-	-	-	-	-
Turkey	Iskenderun	15.4	19.21	-	-	-	-	-	-	-

Blank cells mean no information available

Country	Hot Spot	Hg kg/yr	Cd kg/yr	Pb kg/yr	Cr kg/yr	Cu kg/yr	Zn kg/yr	Ni kg/yr	POPs	Other
Turkey	Kirikhan	-	-	-	-	-	-	-	-	-
Turkey	Dortyol	-	-	-	-	-	-	-	-	-
Turkey	Erdemli	-	-	-	-	-	-	-	-	-
Turkey	Silifke	-	-	-	-	-	-	-	-	-
Turkey	Osmaniye	-	-	-	-	-	-	-	-	-

Blank cells mean no information available

Table III-4 PRIORITY POLLUTION SENSITIVE AREAS BY COUNTRY

Country	Sensitive Area	Estimated Costs of Protective Action (millions of dollars)
Albania	Kuna-Vain Lagoons	26
	Karavasta Lagoon	1-2
	Narta Lagoon	3-5
Algeria	Golfe de Ghazaouet	-
	Golfe de Arzew-Mostaganem	-
	Baie d'Alger	-
	Baie d'Annaba	-
	Golfe de Skikda	-
	Baie de Bejaia	-
Croatia	Malostonski	1.2
	Limski Channel	0.7
	Kornati	0.9
	Mljet	0.2
	Krka est.	1.5
Cyprus	Vassilikos Bay	
Egypt	Lake Bardawil	-
France	Collioure- Cap Leucate	-
	Cap Leucate-L'Espiguette	-
	Rhone Mouth Fos Gulf	-
Greece	Amvrakikos Gulf	11
	Lagoon of Mesologgi	
Italy	Vado Ligure-Savona	8
	Secche della Meloria	2
	Isola d'Elba	10
	Pesaro-Cervia	10
	Mouth of Po	30
	Venezia and its lagoon	20
	Panzano Bay	5
Lebanon	Sour	19
	Jbail (Byblos)	7.5

Country	Sensitive Area	Estimated Costs of Protective Action (millions of dollars)
Malta	Weid Ghammieq	3.6
	Cumnija	8
	Ras il-Hobz	4
Morocco	Al-Hoceima	-
Slovenia	Koper Bay	(included in Rizana River)
	Piran Bay	(see Piran)
Spain	Albufera de Valencia	-
	Delta del Ebro	-
	Mar Menor	-
Syria	Umit Tiur	-
	Azwad island	-
	Wadi Qandeel	-
	Lattakia beach (southeast)	-
	Rasl Fassouri	-
Tunisia	Ghar El Melh	4
Turkey	Adana area	-
	Izmir Bay area	-
	Içel area	-
	Mersin-kazanli	-
	Hatay-Samandag	-
	Aydin and Mugla	-