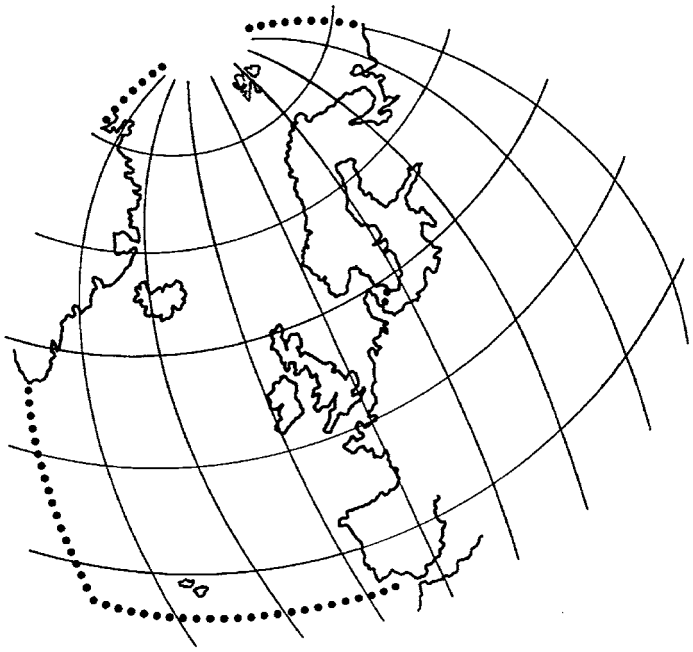
Data Report on the Comprehensive Study of Riverine Inputs and Direct Discharges (RID) in 1997



OSPAR Commission
2000

The Convention for the Protection of the Marine Environment of the North-East Atlantic (the "OSPAR Convention") was opened for signature at the Ministerial Meeting of the former Oslo and Paris Commissions in Paris on 22 September 1992. The Convention entered into force on 25 March 1998. It has been ratified by Belgium, Denmark, Finland, France, Germany, Iceland, Ireland, Luxembourg, Netherlands, Norway, Portugal, Sweden, Switzerland and the United Kingdom and approved by the European Union and Spain.

La Convention pour la protection du milieu marin de l'Atlantique du Nord-Est, dite Convention OSPAR, a été ouverte à la signature à la réunion ministérielle des anciennes Commissions d'Oslo et de Paris, à Paris le 22 septembre 1992. La Convention est entrée en vigueur le 25 mars 1998. La Convention a été ratifiée par l'Allemagne, la Belgique, le Danemark, la Finlande, la France, l'Irlande, l'Islande, le Luxembourg, la Norvège, les Pays-Bas, le Portugal, le Royaume-Uni de Grande Bretagne et d'Irlande du Nord, la Suède et la Suisse et approuvée par l'Espagne et l'Union européenne.

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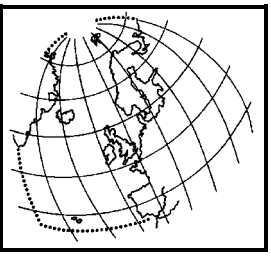

Data Report on the Comprehensive Study of Riverine Inputs and Direct Discharges (RID) in 1997

This data report complements the report containing the overview of the results of the Comprehensive Study on Riverine Inputs and Direct Discharges (RID) in 1997.

Previous data reports include the results of the Comprehensive Study in 1990, 1991, 1992, 1993, 1994, 1995 and 1996. A RID Summary Report 1990 – 1995 was published at the end of 1998.

Introduction

Background

At its Tenth Meeting (Lisbon, 1988) the Paris Commission[1] (PARCOM) adopted the Principles of the Comprehensive Study on Riverine Inputs (PARCOM 10/10/1, § 4.25 (e)). Such a comprehensive study was conducted for the first time in 1990 with the objective of assessing, as accurately as possible, all river borne and direct inputs of selected pollutants to the maritime area of the Paris Convention. Contracting Parties to the Paris Convention should aim to monitor, on a regular basis, 90 % of the inputs of each selected pollutant and are requested to report the relevant data annually (by 30 September) and provide, for a selection of their main rivers, information on the annual mean/median concentration of selected pollutant. The results of such input studies are to be reviewed periodically with the objective of determining temporal and long-term trends of contaminant concentrations and inputs as a basis for trend assessment. The results of the input studies will also be reviewed with a view to deciding, on the basis of the data for 1990 to 1995, whether the Principles of the Comprehensive Study on Riverine Inputs need to be adjusted.

Substances

Contracting Parties agreed to monitor the following parameters on a mandatory basis:

- mercury (Hg)
- cadmium (Cd)
- copper (Cu)
- zinc (Zn)
- lead (Pb)
- γ-HCH (lindane)
- ammonia expressed as N
- nitrates expressed as N
- orthophosphates expressed as P
- total N
- total P
- suspended particulate matter (SPM)
- salinity (in saline waters)

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1 The Convention for the Protection of the Marine Environment of the North East Atlantic, 1992 (OSPAR Convention) entered into force on 25 March 1998. This Convention replaces the Oslo and Paris Conventions as between the Contracting Parties. Agreements continue to be applicable to the extent that they are compatible with, or not explicitly terminated by, the Convention or by the OSPAR Commission.

The following parameters were recommended to be monitored on a voluntary basis:

- PCBs (the following congeners: IUPAC Nos 28, 52, 101, 118, 153, 138, 180)
- hydrocarbons (strongly recommended)
- other stable organohalogen compounds (in order to find out which organohalogen compounds should be included in future input studies).

In March 1996, the Environmental Assessment and Monitoring Committee (ASMO 1996) revised the RID Principles, including the list of determinands, as follows:

"The following determinands are to be monitored on a mandatory basis:

- Total Mercury (Hg)
- Total Cadmium (Cd)
- Total Copper (Cu)
- Total Zinc (Zn)
- Total Lead (Pb)
- Gamma-HCH (lindane)
- Ammonia expressed as N
- Nitrates expressed as N
- Orthophosphates expressed as P
- Total N
- Total P
- Suspended particulate matter (SPM)
- Salinity (in saline waters)

2.2 The following determinands are recommended for monitoring on a voluntary basis:

a. Hydrocarbons, in particular PAHs[2] and mineral oil[3] (strongly recommended);

b. PCBs (the following congeners: IUPAC Nos 28, 52, 101, 118, 153, 138, 180);

c. Other hazardous substances (particularly organohalogen compounds - in order to determine which organohalogen compounds should be included in future input studies)[4]."

Reports on the substances that are explicitly mentioned in the revised RID Principles will be incorporated into future data reports as and when they become available.

1997 Report on input data

For the 1997 study, data sets on riverine inputs and direct discharges were provided by Denmark, Germany, the Netherlands, Norway, Portugal, Sweden and the United Kingdom of Great Britain and Northern Ireland (UK). Only riverine inputs were reported by Belgium[5], Ireland[6] and Spain[7]. France and Iceland[8] did not provide input data for 1997.

The geographical coverage for 1997 was similar to the coverage in previous years. Significant gaps occur in the data from Portugal and Spain. The part of the maritime area best covered remains the OSPAR Region II, the Greater North Sea, and especially the main body of the North Sea, although even here gaps exist.

The reporting of mandatory and voluntary determinands (cf. Table 1b) in 1997 was similar to 1996. Not all Contracting Parties reported data for all mandatory parameters. All reporting Contracting Parties provided data on inputs of heavy metals with the exception of Denmark (no metal data for 1997) and Spain (only riverine inputs). There are a number of gaps as regards the reporting of data for inputs of γ-HCH and PCBs

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2 These are as follows: phenanthrene, anthracene, fluoranthene, pyrene, benzo[*a*]anthracene, chrysene, benzo[*a*]pyrene, benzo[*ghi*]perylene, indeno[*1,2,3-cd*]pyrene.

3 Provided that a suitable method is available.

4 INPUT November 1995 agreed not to advocate routine monitoring of riverine inputs of pesticides Convention wide but to address specific requests from SIME or DIFF on a case by case basis.

5 Previously existing direct discharges no longer exist.

6 1990 data for direct inputs are included, since the basis for the calculation remains unchanged.

7 Rivers Guadalquivir, Guadiana and Miño.

8 Iceland stated in 1988 that it had no plans to monitor riverine inputs; however, Iceland announced in 1996 that it was setting up a monitoring plan which would also result in calculation of riverine inputs.

(Denmark Ireland and Sweden for all inputs, Norway and Spain for direct inputs) and suspended particulate matter (Denmark, Sweden for rivers). A number of additional parameters, not summarised in the overview Tables 3 and 4, were reported by Ireland and Norway (cf. Table 1b).

Information on characteristics of the catchment areas of the rivers is included in Appendix 1.

Presentation of the 1997 data

Table 1a gives an overview of the information provided by Contracting Parties for 1997 and shows how the information was categorised:

- Direct inputs:
  - Sewage effluents
  - Industrial effluents
- Coastal areas: Data reported under "coastal areas" include discharges and run-off from coastal areas between rivers and also polder effluents. Depending on their nature, discharges from "coastal areas" are either counted under direct discharges or under riverine inputs.
- Riverine inputs:
  - Main rivers
  - Tributary rivers

Table 1b gives an overview of the determinands reported by Contracting Parties and shows where there are gaps in the reporting of mandatory determinands. Table 1b also indicates the precision of the estimate where the relevant information was provided by Contracting Parties. The last column of Table 1b informs on any additional determinands reported.

The data from Contracting Parties have in many cases[9] been rounded to one significant number for data reported less than the unit in which they appear and to two significant numbers for data reported greater than one unit; the following examples illustrate this rounding convention:

Amount reported by Contracting Party	Figure reported in the tables
0,0011	0,001
0,011	0,01
0,11	0,1
1,11	1,1
11,1	11
111 and above	not rounded

[9] Secretariat note: Not all Contracting Parties wished to have their data rounded in accordance with this procedure. Totals in the summary tables are not rounded.

Due to this procedure, there are sometimes slight differences between the calculated totals given in this report and those calculated by Contracting Parties.

Overviews of the input information by country and sea area are given in **Tables 2 to 4 a and b**. Table 2 gives an overview of direct inputs to Paris Convention Waters in 1997 and summarises the information which is set out in detail in Tables 5 on a country by country basis. Table 3 gives an overview of riverine inputs to Paris Convention waters in 1997 and summarises the information which is set out in detail in Tables 6 on a country by country basis. Table 4a summarises the information contained in Tables 2 and 3 and gives overall figures on inputs from land-based sources. Table 4b contains the same information as Table 4a but lists inputs by sea area. Please note that, due to major gaps in the reporting, no totals for the Convention area are given in Tables 2 to 4 a and b.

Annexes (country by country)

Where submitted by the Contracting Party concerned, additional relevant information, *inter alia*, on the data originators, the methods and calculation procedures used, and on discharge areas or catchment areas is given in a separate report at the beginning of the annex.

Tables 5 give the detailed data **for** direct inputs (direct discharges) country by country, broken down, where applicable, in sewage effluents (Table 5a) and industrial effluents (Table 5b). A summary table for the total direct discharges is given as Table 5c.

Tables 6 give the detailed data for riverine inputs country by country, broken down, where applicable, in main rivers (Table 6a) and tributary rivers (Table 6b). A summary Table 6c is given for the total riverine inputs.

Tables 7 give statistical data of the measured concentrations in rivers, as reported by Contracting Parties.

Tables 8 give information concerning the analytical detection limits of determinands.

Tables 9 give, for those Contracting Parties reporting data in the format compatible with the new RID database at the OSPAR Secretariat (RIDAB), catchment-dependent information which, for the other Contracting Parties, is included in tables (5 and) 6.

“Extra” data on other voluntary determinands, usually added at the end of the relevant annex in the data report, have not been submitted for 1997.

List of the overview tables

List of the Annexes by Contracting Party

Table 1a. Information Received on Inputs to the Maritime Area of the OSPAR Convention in 1997

Country	Direct Discharges			Riverine Inputs	
	Sewage Effluents	Industrial Effluents	Coastal Areas (2)	Main Rivers	Tributary Rivers (1)
Belgium	NA	NA	(3)	+	+
Denmark					
- Kattegat	+	+	NI	+	NI
- Skagerrak	+	+	NI	+	NI
- North Sea	+	+	NI	+	NI
France					
- North Sea	NI	NI	NI	NI	NI
- Channel	NI	NI	NI	NI	NI
- Atlantic	NI	NI	NI	NI	NI
Germany	+	+	(4)	+	+
Iceland	No 1997 input data available (5)				
Ireland					
- Irish Sea	+ (6)	+ (6)		+	+
- Celtic Sea	+ (6)	+ (6)		+	+
- Atlantic	+ (6)	+ (6)		+	+
Netherlands	+	+	(3)	+	+
Norway					
- Skagerrak	+	+	+ (7)	+	+
- North Sea	+	+	+ (7)	+	+
- Norwegian S	+	+	+ (7)	+	+
- Barents Sea	+	+	+ (7)	+	+
Portugal	Very limited 1997 input data available				
Spain	NI	NI	NI	+	+
Sweden					
- Kattegat	+	+	(3)	+	+
- Skagerrak	+	+	(3)	+	+
United Kingdom					
- East Coast	+	+	NI	+	NI
- Channel	+	+	NI	+	NI
- Celtic Sea	+	+	NI	+	NI
- Irish Sea	+	+	NI	+	NI
- Atlantic	+	+	NI	+	NI

+ = Information available

NI = No information

NA = Not applicable

(1) Tributary Rive - any tributary river flowing into (the estuary of) a main river, downstream from the sampling po
- any minor river which was not deemed to be a main river.

(2) Coastal areas: - 'downstream areas' of main and tributary rivers and rivers not monitored;
- areas discharging to the maritime area which, however, are located outside the catchment area o

(3) Included in data on riverine inputs ("tributary rivers")

(4) Included in data on direct inputs

(5) Iceland stated in 1988 that it had no plans to monitor riverine inputs; however, Iceland announced in 1996 that it was setting up a monitoring plan which would also result in calculations of riverine inputs

(6) 1990 data

(7) cf. category "run-off" in Table 6b. for Norway and explanation under [D.4] of the Norwegian Annual Report.

Table 1b. Determinands Reported by Contracting Parties in 1997

Country	Determinands													
	Cd	Hg	Cu	Pb	Zn	g-HCH	PCBs (1) (voluntary)	NH4-N	NO3-N	PO4-P	Total N	Total P	SPM (2)	Others
Belgium														
- direct inputs	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	
- riverine inputs	R (4)	R (3)	R (4)	R (4)	R (3)	R (3)	R (4)	R (3)	R (3)	R (3)	R (3)	R (3)	R (3)	
Denmark														
- direct inputs	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	+	+	NI	
- riverine inputs	NI	NI	NI	NI	NI	NI	NI	+	+	+	+	+	NI	
France	no data submitted for 1997													
- direct inputs														
- riverine inputs														
Germany														
- direct inputs	R	R	R	R	R	R	R	+	+	+	+	+	+	
- riverine inputs*	+ (3)	+ (3)	+ (3)	+ (3)	+ (3)	+ (3)	+ (4)	+ (3)	+ (3)	+ (3)	+ (3)	+ (3)	+ (3)	
- riverine inputs**	+ (3)(4)	+ (3)	+ (3)	+ (3)	+ (3)	+ (3)	+ (4)	+ (3)	+ (3)	+ (3)(4)	+ (3)	+ (3)	+ (3)(4)	
*) Elbe **) Other main rivers														
Iceland	No 1997 input data available (6)													
- direct inputs														
- riverine inputs														
Ireland														
- direct inputs	+(8)	NI	+(8)	+(8)	+(8)	NI	NI	NI	NI	NI	+(8)	+(8)	+(8)	
- main riv. input	R (3)(4)	NI	R (3)(4)	R (3)(4)	+ (3)	NI	NI	+ (3)	+ (3)	+ (3)	+ (3)	+ (3)	+ (3)	organic N (TKN)
- tributary rivers	R	NI	R	R	+	NI	NI	+	+	+	+	+	+	organic N (TKN)
Netherlands														
- direct inputs	+	+	+	+	+	NI	NI	+	+	NI	+	+	+	
- main riv. input	+ (3)(4)	+ (3)	+ (3)	+ (3)(4)	+ (4)	+ (3)	+ (3)(4)	+ (3)	+ (3)	+ (3)	+ (3)	+ (3)	+ (3)	
- tributary rivers	+	+	+	+	+	+	+	+	+	+	+	+	+	
Norway														
- direct inputs	+	+	+	+	+	NI	NI	+	+	+	+	+	+	As, Cr, Ni, TOC
- main riv. input	+ (3)(4)	+ (4)	+ (3)	+ (3)	+ (3)	+ (3)	R (4)	+ (3)(4)	+ (3)	+ (3)(4)	+ (3)	+ (3)	+ (3)	As, Cr, Ni, TOC
- tributary rivers	R	R	+	+	+	+	R	+(5)	+ (5)	+ (5)	+ (5)	+ (5)	+ (5)	As, Cr, Ni, TOC
Portugal														
- direct inputs	NI	+	NI	NI	NI	NI	NI	NI	NI	NI	+	+	+	
- main riv. Input	R(4)	R(4)	R(3)	R(4)	R(4)	NI	NI	+	+	+	NI	+	+	
- tributary rivers	R	R	R	R	R	NI	NI	+	+	+	NI	+	+	
Spain														
- direct inputs	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	
- riverine inputs	R(4)	R(4)	R(4)	R(4)	+ (3)(4)	R(4)	NI	R(3)(4)	R(3)	R(3)	NI	NI	+ (3)	
Sweden														
- sewage effluen	+	+	+	+	+	NI	NI	+	+	+	+	+	+	
- industrial efflu	+	+	+	+	+	NI	NI	NI	NI	NI	+	+	NI	
- main riv. input	+ (3)	+ (3)	+ (3)	+ (3)	+ (3)	NI	NI	+ (3)	+ (3)	+ (3)	+ (3)	+ (3)	NI	(?): no '96 conc.data
- tributary rivers	+	+	+	+	+	NI	NI	+	+	+	+	+	NI	
United Kingdom														
- direct inputs	R	R	R	R	R	R	R	R	R	R	R	R(9)	R	
- riverine inputs	R	R	R	R	R	R	R	R	R	R	R	R(9)	R	

+ : Data provided

R: Estimate given as a range

NI: No information

NA: Not applicable; riverine inputs > 90% total inputs

DL: Detection limit

(1) IUPAC Nos 28, 52, 101, 118, 153, 138, 180

(2) Suspended particulate matter

(3) 70 % of measurements above detection limit

(4) Less than 70 % of measurements above detection limit

(5) Includes run-off

(6) Iceland stated in 1988 that it had no plans to monitor riverine inputs; however, Iceland announced in 1996 that it was setting up a monitoring plan which would also result in calculations of riverine inputs

(7) River Tejo only

(8) 1990 data, since the basis for calculation remained unchanged

(9) In England and Wales Total-P was not measured. To avoid anomalies, a value equal to the orthophosphate-P has been used.

Table 2^. Direct Discharges to the Maritime Area of the OSPAR Convention in 1997 by Country

Country	Region		Cd [t]	Hg [t]	Cu [t]	Pb [t]	Zn [t]	g-HCH [kg]	PCBs (1) [kg]	NH4-N [kt]	NO3-N [kt]	PO4-P [kt]	Total N [kt]	Total P [kt]	SPM(2) [kt]
Belgium	North Sea	(upper estimate)	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
		(upper estimate)	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Denmark	North Sea		NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	0.7	0.07	NI
	Skagerrak		NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	0.08	0.009	NI
	Kattegat		NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	1.3	0.1	NI
France	Channel/North Sea		no data submitted for 1997												
	Atlantic		no data submitted for 1997												
Germany	North Sea		0.06	0.01	2.3	2.2	21	0.02	0.05	2.0	2.0	0.1	4.3	0.5	2.0
			0.1	0.07	3.0	2.8	26	0.3	2.9	2.0	2.0	0.1	4.3	0.5	2.0
Iceland	Atlantic		no data submitted for 1997												
Ireland	Irish Sea		0.06	NI	7.5	3.3	63	NI	NI	NI	NI	NI	6.8	1.6	38
	Celtic Sea		0.02	NI	3.2	4.4	22	NI	NI	NI	NI	NI	2.7	0.7	19
	Atlantic		0.01	NI	0.8	0.4	7.7	NI	NI	NI	NI	NI	0.7	0.2	4.3
Netherlands	North Sea		0.2	0.08	2.4	2.9	28	0	0	3.3	1.5	NI	6.4	0.6	9.6
Norway	Skagerrak		0.1	0.05	27	0.6	21	NI	NI	4.0	0.1	0.1	6.6	0.3	10
	North Sea		1.0	0.04	8.7	4.2	58	NI	NI	2.7	0.02	0.2	4.8	0.4	1408
	Norwegian Sea		0.1	0.02	27	0.9	61	NI	NI	3.4	0.02	0.3	6.1	0.7	1403
	Barents Sea		0.00	0.000	0.4	0.01	0.4	NI	NI	0.3	0.002	0.03	0.4	0.05	377
Portugal	Atlantic		NI	0.03	NI	NI	NI	NI	NI	NI	NI	NI	7.4	2.2	45
			NI	0.03	NI	NI	NI	NI	NI	NI	NI	NI	7.4	2.2	45
Spain	Atlantic		NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI
Sweden	Kattegat		0.09	0.03	2.6	0.6	7.1	NI	NI	0.1	0.1	0.006	2.8	0.1	NI
	Skagerrak		0.001	0.002	0.08	0.03	0.2	NI	NI	0.1	0.1	0.002	0.5	0.01	NI
United Kingdo	N Sea (East Coas	(lower estimate)	1.0	0.2	92	37	344	109	0.6	26	10	8.0	42	8.9	447
		(upper estimate)	1.1	0.3	93	37	344	124	84	26	10	8.0	42	8.9	447
	N Sea (Channel)	(lower estimate)	0.5	0.001	21	4.5	34	9.4	0.000	7.9	1.6	1.8	9.6	1.8	9.7
		(upper estimate)	0.5	0.001	21	4.5	34	9.4	0.000	7.9	1.7	1.8	9.7	1.8	9.7
	Total North Sea	*(lower estimate)*	*1.4*	*0.2*	*114*	*41*	*378*	*118*	*0.6*	*34*	*12*	*9.8*	*52*	*11*	*457*
		(upper estimate)	*1.5*	*0.3*	*114*	*42*	*378*	*134*	*84*	*34*	*12*	*9.8*	*52*	*11*	*457*
	Celtic Sea	(lower estimate)	1.4	0.04	10.7	8.7	142	1.9	2.2	7.1	1.4	1.3	8.8	1.3	59
		(upper estimate)	1.4	0.04	10.7	8.7	142	2.8	5.4	7.1	1.4	1.3	8.8	1.3	59
	Irish Sea	(lower estimate)	2.9	0.3	14	37	79	3.3	0.003	6.8	1.3	3.3	11	3.9	29
		(upper estimate)	3.2	0.3	14	38	79	7.5	0.6	6.8	1.4	3.3	11	3.9	29
	Atlantic	(lower estimate)	0.09	0.009	18	6.0	35	52	0.4	4.2	2.5	1.2	7.5	2.0	25
		(upper estimate)	0.9	0.04	25	8.9	36	53	88	4.2	2.5	1.2	7.6	2.0	25
	Total Non-North	*(lower estimate)*	*4.4*	*0.3*	*42*	*52*	*256*	*57*	*2.6*	*18*	*5.2*	*5.7*	*27*	*7.2*	*113*
		(upper estimate)	*5.5*	*0.4*	*49*	*56*	*257*	*63*	*94*	*18*	*5.3*	*5.7*	*28*	*7.2*	*113*

^ For explanation of data and reasons for lack of information, see Tables 1a and 1b

(1) IUPAC Nos 28, 52, 101, 118, 153, 138, 180

(2) Suspended particulate matter

Table 3^. Riverine Inputs to the Maritime Area of the OSPAR Convention in 1997 by Country

Country	Sea area		Cd [t]	Hg [t]	Cu [t]	Pb [t]	Zn [t]	g-HCH [kg]	PCBs (1) [kg]	NH4-N [kt]	NO3-N [kt]	PO4-P [kt]	Total N [kt]	Total P [kt]	SPM(2) [kt]
Belgium	North Sea	(lower estimate)	0.1	0.2	26	18	325	56	0.0	6.6	21	1.8	34	2.6	221
		(upper estimate)	5.2	0.3	63	62	456	76	132	8.8	27	2.4	44	6.4	309
Denmark	North Sea		NI	NI	NI	NI	NI	NI	NI	NI	10	0.09	12	0.3	NI
	Skagerrak		NI	NI	NI	NI	NI	NI	NI	NI	1.3	0.03	1.6	0.07	NI
	Kattegat		NI	NI	NI	NI	NI	NI	NI	NI	17	0.3	20	0.6	NI
France	Channel/North Sea		no data submitted for 1997												
	Atlantic		no data submitted for 1997												
Germany	North Sea	(lower estimate)	6.2	1.9	149	149	1051	370	37	7.2	149	2.5	201	8.2	1527
		(upper estimate)	6.3	1.9	149	149	1051	370	178	7.2	149	2.5	201	8.2	1566
Iceland	Atlantic		no data submitted for 1997												
Ireland	Irish Sea		0.6	NI	22	24	209	NI	NI	1.9	23	0.4	NI	1.2	134
			0.7	NI	22	24	209	NI	NI	1.9	23	0.4	NI	1.2	134
	Celtic Sea		0.9	NI	58	69	279	NI	NI	2.9	67	1.8	NI	4.6	369
			1.7	NI	58	72	279	NI	NI	2.9	67	1.8	NI	4.6	369
	Atlantic		0.3	NI	20	18	111	NI	NI	0.4	14	0.3	NI	1.2	124
Note: NO3 = total oxidised N			0.9	NI	22	19	112	NI	NI	0.5	14	0.3	NI	1.2	124
Netherlands	North Sea		3.7	2.6	280	230	1200	300	140	14	210	8.7	280	17	2210
			4.0	2.6	280	230	1300	300	200	14	210	8.7	280	17	2220
Norway	Skagerrak		1.4	0.04	76	18	281	28	0.04	1.5	18	0.2	28	0.6	254
			1.6	0.07	76	18	281	28	11.2	1.5	18	0.2	28	0.6	254
	North Sea		0.9	0.02	26	16	186	18	0.0	1.0	15	0.2	25	0.5	3.1
			1.1	0.05	26	16	186	18	10.6	1.1	14.9	0.2	25	0.5	3.1
	Norwegian Sea		0.8	0.2	128	18	235	29	0.0	1.6	14	0.3	26	0.9	35
			1.2	0.2	128	18	235	29	19	1.6	14	0.3	26	0.9	35
	Barents Sea		0.6	0.01	34	5.6	63	3.7	0.0	0.2	1.6	0.05	4.4	0.2	3.0
			0.7	0.03	34	5.7	63	3.7	4.3	0.2	1.6	0.05	4.4	0.2	3.0
Portugal	Atlantic		1.3	0.7	41	43	116	NI	NI	1.9	26	2.9	NI	3.7	302
			1.4	1.4	41	43	285	NI	NI	1.9	26	2.9	NI	3.7	302
Spain	Atlantic		11	2.6	94	16	3063	157	NI	6.5	80	1.1	123	2.1	1174
			18	2.6	153	18	3063	250	NI	6.5	80	1.1	123	2.1	1174
Sweden	Kattegat		0.3	0.05	25	7.3	87	NI	NI	0.9	13	0.1	22	0.5	NI
	Skagerrak		0.07	0.007	4.5	0.8	21	NI	NI	0.09	1.0	0.009	2.2	0.03	NI
United Kingdo	N Sea (East Coast)	(lower estimate)	2.6	1.6	140	159	597	61	53	3.7	81	8.6	95	9.0	488
		(upper estimate)	6.5	2.4	140	164	609	92	118	3.8	82	8.6	96	9.0	509
	N Sea (Channel)	(lower estimate)	0.6	0.04	37	7.3	168	9.7	0.00	0.7	24	1.1	25	1.1	89
		(upper estimate)	0.6	0.06	37	7.5	169	16	0.00	0.7	24	1.1	25	1.1	90
	Total North Sea	*(lower estimate)*	*3.2*	*1.6*	*177*	*166*	*765*	*70*	*53*	*4.4*	*105*	*9.6*	*120*	*10.1*	*577*
		(upper estimate)	*7.1*	*2.5*	*178*	*172*	*778*	*108*	*118*	*4.5*	*105*	*9.7*	*120*	*10.1*	*599*
	Celtic Sea	(lower estimate)	0.9	0.07	42	35	295	17	32	1.8	35	2.4	37	2.4	565
		(upper estimate)	1.2	0.1	42	40	295	29	61	1.8	35	2.4	37	2.4	566
	Irish Sea	(lower estimate)	0.9	0.3	48	27	310	13	7.3	6.3	35	2.8	43	3.0	150
		(upper estimate)	1.6	1.0	50	33	310	46	190	6.3	35	2.8	45	3.1	150
	Atlantic	(lower estimate)	0.7	0.7	54	33	154	21	2.3	3.4	16	0.4	17	2.2	253
		(upper estimate)	2.6	1.2	54	35	159	33	75	3.7	16	1.4	17	2.2	267
	Total non-North Sea	*(lower estimate)*	*2.5*	*1.0*	*144*	*95*	*759*	*51*	*42*	*12*	*86*	*5.6*	*97*	*7.7*	*969*
		(upper estimate)	*5.4*	*2.4*	*147*	*108*	*765*	*108*	*326*	*12*	*86*	*6.6*	*99*	*7.8*	*983*

^ For explanation of data and reasons for lack of information, see Tables 1a and 1b

(1) IUPAC Nos 28, 52, 101, 118, 153, 138, 180

(2) Suspended particulate matter

Table 4a. Summary of Direct (Table 2) and Riverine (Table 3) Inputs to the Maritime Area of the OSPAR Convention in 1997 by Country

Country	Sea Area		Cd [t]	Hg [t]	Cu [t]	Pb [t]	Zn [t]	g-HCH [kg]	PCBs (1) [kg]	NH4-N [kt]	NO3-N [kt]	PO4-P [kt]	Total N [kt]	Total P [kt]	SPM(2) [kt]
Belgium	North Sea	(lower estimate)	0.1	0.2	26	18	325	56	0.0	6.6	21	1.8	34	2.6	221
		(upper estimate)	5.2	0.3	63	62	456	76	132	8.8	27	2.4	44	6.4	309
Denmark	North Sea		NI	NI	NI	NI	NI	NI	NI	NI	10	0.09	13	0.4	NI
	Skagerrak		NI	NI	NI	NI	NI	NI	NI	NI	1.3	0.03	1.7	0.08	NI
	Kattegat		NI	NI	NI	NI	NI	NI	NI	NI	17	0.32	21	0.7	NI
France	Channel/North Sea		no data submitted for 1997												
	Atlantic		no data submitted for 1997												
Germany	North Sea	(lower estimate)	6.3	1.9	151	151	1072	370	37	9.2	151	2.6	205	8.7	1529
		(upper estimate)	6.4	2.0	152	152	1077	370	181	9.2	151	2.6	205	8.7	1568
Iceland	Atlantic		no data submitted for 1997												
Ireland (2)	Irish Sea	(lower estimate)	0.6	NI	30	27	272	NI	NI	1.9	23	0.4	6.8	2.8	170
		(upper estimate)	0.7	NI	30	27	272	NI	NI	1.9	23	0.4	6.8	2.8	170
	Celtic Sea	(lower estimate)	0.9	NI	62	73	301	NI	NI	2.9	67	1.8	2.7	5.2	390
		(upper estimate)	1.7	NI	62	77	301	NI	NI	2.9	67	1.8	2.7	5.2	390
	Atlantic	(lower estimate)	0.3	NI	21	18	119	NI	NI	0.4	14	0.3	0.7	1.4	130
		(upper estimate)	0.9	NI	22	19	119	NI	NI	0.4	14	0.3	0.7	1.4	130
Netherlands(3)	North Sea		3.9	2.7	283	233	1228	300	140	17	211	8.7	286	18	2220
			4.2	2.7	283	233	1328	300	200	17	211	8.7	286	18	2230
Norway	Skagerrak	(lower estimate)	1.5	0.09	102	19	303	28	0.04	5.5	18	0.3	35	0.8	265
		(upper estimate)	1.6	0.12	102	19	303	28	11.2	5.5	18	0.3	35	0.8	265
	North Sea	(lower estimate)	1.8	0.06	35	20	244	18	0.0	3.7	15	0.4	29	0.9	1411
		(upper estimate)	2.0	0.09	35	20	244	18	10.6	3.7	15	0.4	29	0.9	1411
	Norwegian Sea	(lower estimate)	0.9	0.2	155	19	297	29	0.0	5.0	14	0.7	32	1.6	1439
		(upper estimate)	1.3	0.2	155	19	297	29	19	5.0	14	0.7	32	1.6	1439
	Barents Sea	(lower estimate)	0.6	0.01	34	5.6	64	3.7	0.0	0.5	1.6	0.1	4.8	0.2	380
		(upper estimate)	0.7	0.03	34	5.7	64	3.7	4.3	0.5	1.6	0.1	4.8	0.2	380
Portugal	Atlantic		1.3	0.8	41	43	116	NI	NI	1.9	26	2.9	7.4	5.9	347
			1.4	1.5	41	43	285	NI	NI	1.9	26	2.9	7.4	5.9	347

Table 4a Continued

Country	Sea Area		Cd [t]	Hg [t]	Cu [t]	Pb [t]	Zn [t]	g-HCH [kg]	PCBs (1) [kg]	NH4-N [kt]	NO3-N [kt]	PO4-P [kt]	Total N [kt]	Total P [kt]	SPM(2) [kt]
Spain	Atlantic		11 18	2.6 2.6	94 153	16 18	3063 3063	157 250	NI NI	6.5 6.5	80 80	1.1 1.1	123 123	2.1 2.1	1174 1174
Sweden	Kattegat Skagerrak		0.4 0.07	0.08 0.009	28 4.6	7.8 0.9	94 21	NI NI	NI NI	1.0 0.2	13 1.1	0.1 0.01	25 2.6	0.6 0.04	NI NI
United Kingdo	N Sea (East Coast)	(lower estimate)	3.1	1.8	232	136	1040	170	53	30	91	17	137	18	935
		(upper estimate)	7.5	2.7	233	136	953	216	202	30	92	17	138	18	956
	N Sea (Channel)	(lower estimate)	1.1	0.04	59	12	202	19	0.0	8.5	25	2.8	34	2.8	99
		(upper estimate)	1.1	0.07	59	12	203	25	0.0	8.5	25	2.9	34	2.9	100
	North Sea	*(lower estimate)*	*4.6*	*1.8*	*291*	*207*	*1143*	*189*	*53*	*38*	*117*	*19*	*171*	*21*	*1034*
		(upper estimate)	*8.6*	*2.7*	*292*	*214*	*1156*	*242*	*202*	*38*	*117*	*19*	*172*	*21*	*1056*
	Celtic Sea	(lower estimate)	2.3	0.1	53	44	437	19	35	9.0	36	3.7	46	3.7	624
		(upper estimate)	2.7	0.2	53	49	437	32	66	9.0	36	3.7	46	3.7	625
	Irish Sea	(lower estimate)	3.8	0.6	62	64	389	16	7.3	13	36	6.1	54	6.9	179
		(upper estimate)	4.8	1.3	64	71	389	53	191	13	36	6.1	56	7.0	179
	Atlantic	(lower estimate)	0.8	0.7	72	39	189	73	2.7	7.6	19	1.6	24	4.2	279
		(upper estimate)	3.5	1.3	79	44	195	86	163	7.9	19	2.5	24	4.3	292
	non-North Sea	*(lower estimate)*	*6.9*	*1.3*	*186*	*147*	*1015*	*109*	*45*	*30*	*91*	*11*	*124*	*15*	*1082*
		(upper estimate)	*11*	*2.7*	*196*	*164*	*1021*	*172*	*420*	*30*	*91*	*12*	*126*	*15*	*1096*
Total reported:		(lower estimate)	**41**	**12**	**1543**	**946**	**9774**	**1261**	**275**	**131**	**891**	**52**	**1126**	**87**	**11790**
		(upper estimate)	**64**	**15**	**1653**	**1015**	**10100**	**1489**	**1179**	**133**	**897**	**54**	**1139**	**91**	**11964**

(1) IUPAC Nos 28, 52, 101, 118, 153, 138, 180

(2) NH4-N, NO3-N,PO4-P: riverine inputs only; Total N: direct discharge only

(3) Data provided comprise approx. 90% of the total pollution loads of the Netherlands into Convention Waters

Table 4b. Summary of Direct and Riverine Inputs to the Maritime Area of the OSPAR Convention in 1997 by Sea Area

Sea Area			Cd [t]	Hg [t]	Cu [t]	Pb [t]	Zn [t]	g-HCH [kg]	PCBs(1) [kg]	NH4-N [kt]	NO3-N [kt]	PO4-P [kt]	Total N [kt]	Total P [kt]	SPM(2) [kt]
North-East	***Arctic Ocean***		0.6	0.01	34	5.6	64	3.7	0.0	0.5	1.6	0.1	4.8	0.2	380
Atlantic Ocean	Barents Sea		0.7	0.03	34	5.7	64	3.7	4.3	0.5	1.6	0.1	4.8	0.2	380
	Atlantic Ocean		1.1	0.7	93	57	308	73	2.7	8.0	33	1.9	25	5.7	409
	(main body)		4.3	1.3	101	63	314	86	163	8.3	33	2.8	25	5.7	422
	Bay of Biscay and Iberian Coast		13	3.4	135	59	3179	157	NI	8.4	106	4.0	130	8.0	1521
			19	4.1	194	61	3348	250	NI	8.4	106	4.0	130	8.0	1521
North Sea															
	Kattegat	(lower estimate)	0.4	0.08	28	7.8	94	NI	NI	1.0	30	0.4	46	1.3	0.0
		(upper estimate)	0.4	0.08	28	7.8	94	NI	NI	1.0	30	0.4	46	1.3	0.0
	Skagerrak	(lower estimate)	1.5	0.1	107	20	323	28	0.0	5.7	21	0.4	39	0.9	265
		(upper estimate)	1.7	0.1	107	20	323	28	11	5.7	21	0.4	39	0.9	265
	North Sea	(lower estimate)	15	6.6	727	558	3909	915	230	67	500	30	705	48	6315
	(main body)	(upper estimate)	25	7.7	766	603	4059	981	725	69	506	31	716	52	6473
	Channel	(lower estimate)	1.1	0.04	59	12	202	19	0.0	8.5	25	2.8	34	2.8	99
		(upper estimate)	1.1	0.07	59	12	203	25	0.0	8.5	25	2.9	34	2.9	100
Norwegian Sea		(lower estimate)	0.9	0.2	155	19	297	29	0.0	5.0	14	0.7	32	1.6	1439
		(upper estimate)	1.3	0.2	155	19	297	29	19	5.0	14	0.7	32	1.6	1439
Irish Sea		(lower estimate)	4.4	0.6	91	91	661	16	7.3	15	59	6.6	61	9.7	349
		(upper estimate)	5.5	1.3	94	99	661	53	191	15	59	6.6	63	9.8	349
Celtic Sea		(lower estimate)	3.2	0.1	114	117	737	19	35	12	103	5.5	48	8.9	1014
		(upper estimate)	4.4	0.2	115	125	738	32	66	12	103	5.5	49	8.9	1015

Note: Some Contracting Parties have not submitted information on direct inputs because under the current Principles of the Comprehensive Study, these inputs do not fall under the 90 % (of total inputs) monitoring requirement.

Appendix 1

Statistical information on river catchment areas

Statistical Information on River Catchment Areas

River	Catchment area [km2]	Countries	Share in catchment area [km2]	[%]	Population (1990) [10E6]	[%]	LTA* [1000 m3/d]	LTA-period [a]
Statistical Information provided by Belgium:								
Coastal Area	**2675**				**~0.497**		**2385**	NI
Western	1689	*Belgium*	>1082	NI	>305	NI	708	
		France	NI	NI	NI	NI		
Middle	499	*Belgium*			0.014		501	
Eastern	487	*Belgium*			0.177		1175	
Scheldt basin								
Scheldt	**22004**				**~10**		**9331**	1949-'95
		Belgium (1)	13324	*61*	6.9			
		France	6680	*30*	~2,7			
		Netherlands (1)	2000	*9*	0.4			
		(1) Ghent-Terneuzen canal comprised						
Ghent-Terneuzen canal	**NI**						NI	
		Belgium	NI		NI			
		Netherlands	NI		NI			
Statistical Information provided by Denmark:								
Vid å	1336	*DK*	*1,081*	*81*			1732.4	78-95
		GER	*255*	*19*				
Brøns å	110.7	*DK*	*111*	*100*		*100*	129.1	74-95
Ribe å	961.7	*DK*	*962*	*100*		*100*	1332.3	95
Kongeaen	448.5	*DK*	*449*	*100*		*100*	811.2	94-95
Sneum å	512.9	*DK*	*513*	*100*		*100*	652.3	89-95
Varde å	1090.4	*DK*	*1,090*	*100*		*100*	1409.9	89-95
Skjern å	2377.9	*DK*	*2,378*	*100*		*100*	3258.9	74-95
Stor å	1100.5	*DK*	*1,101*	*100*		*100*	1422.6	71-95
Hover å	95	*DK*	*95*	*100*		*100*	125.2	81-95
Flynder å	n.m.	*DK*	*n.m.*				n.m.	n.m.
Total	**8033.6**							
	10816	**=Total of Danish rivers discharging to the North Sea**						
Liver å	303.3	*DK*	*303*	*100*		*100*	268.6	89-95
Uggerby å	394.6	*DK*	*395*	*100*		*100*	346.3	89-95
	697.9							
	1098	**=Total of Danish rivers discharging to the Skagerrak**						
Karup å	762.9	*DK*	*763*	*100*		*100*	774	86-95
Hvidbjerg å	324.7	*DK*	*325*	*100*		*100*	1045.5	83-95
Jordbr å	144.6	*DK*	*145*	*100*		*100*	150.9	80-95
Skals å	616.6	*DK*	*617*	*100*		*100*	427	73-95
Simmersted å	240.4	*DK*	*240*	*100*		*100*	236.8	92-95
Elling å	142.7	*DK*	*143*	*100*		*100*	115.6	89-95
Voer å	244.8	*DK*	*245*	*100*		*100*	221.5	89-95
Ger å	163.2	*DK*	*163*	*100*		*100*	151.3	85-95
Lindeborg å	374.7	*DK*	*375*	*100*		*100*	344.7	89-95
Haslevgard å	85.5	*DK*	*86*	*100*		*100*	63	89-95
Kastbjerg å	98.1	*DK*	*98*	*100*		*100*	71.3	78-95
Guden å	2637.5	*DK*	*2,638*	*100*		*100*	2861.1	78-95
	5835.7							
	15848	**=Total of Danish rivers discharging to the Kattegat**						
Statistical Information provided by France:								
Somme	6105	France	6105	100			3111	
Seine	73793	France	73793	100	14.9	100	41707	NI
Other rivers	36435	France	36435	100	4.1	100	17266	NI
Total Region II	116333		116333		20.0		62084	
Vilaine	10482	France	10482	100	0.8	100	6446	NI
Loire (entire bassin)	116490	France	116490	100	8.0	100	80216	NI
Charente	9491	France	11819	100	0.6	100	9283	NI
Gironde	80160	France	80160	100	0.9	100	78869	NI
	15895	France	16966	100	0.9	100	15285	NI
Other rivers	25909	France	25208	# 100	1.9	#100	15128	NI
Total Region IV	258427		249384		16.67		205227	

Statistical Information on River Catchment Area

River	Catchment area [km2]	Countries	Share in catchment area [km2]	[%]	Population (1990) [10E6]	[%]	LTA* [1000 m3/d]	LTA-period [a]
Other rivers region II - Catchment areas : Côtiers picards (without the Somme), Côtiers haut-normands, Basse - Normandie, Cotentin, Bretagne Nord.								
Other rivers région IV - Catchments areas : Bretagne sud, Côtiers vendéens, Charente - Seurdre - île d'Oléron (without Charente), Côtiers aquitains, Adour-Nivelle-Bidassoa (without Adour)								
Population : from INSEE for each catchment area (RNDE)								
Statistical Information provided by Germany:								
Ems	15552						7630	1941-1995
		Germany	13152	85.00	3.75	85		
		Netherlands	2400	15.00	0.6	15		
Weser	46306	*Germany*	-	-	9.0	-	30900	1901-1994
Elbe	148268		148268	100	25.11	-	74700	1926-1991
		Germany	*96932*	*65.38*	*19.09*	*76.03*		
		Czech Republic	*50176*	*33.84*	*5.97*	*23.78*		
		Austria	*920*	*0.62*	*0.05*	*0.20*		
		Poland	*240*	*0.16*	*NI*	*NI*		
Eider	2065	*Germany*	-	-	0.159	-	2339	1974-1996
Statistical Information provided by Ireland:								
Boyne	2695	Ireland	-	-	NI	-	3555	1975-1997
Liffey	1256	Ireland	-	-	NI	-	1555	1950-1997
Avoca	652	Ireland	-	0	NI	-	1711	1967-1997
Slaney	1762	Ireland	-	-	NI	-	3297	1980-1997
	6365	**=Total of main Irish rivers discharging to the Irish Sea**						
Barrow*	3067	Ireland	-	-	NI	-	3235	1946-1969
*New gauge recently installed. LTA still based on the period of reliable record for the old gauge.								
Nore	2530	Ireland	-	-	NI	-	3742	1972-1997
Suir	3610	Ireland	-	-	NI	-	5855	1954-1997
Blackwater	3324	Ireland	-	-	NI	-	7302	1956-1997
Lee	1253	Ireland	-	-	NI	-	3405	1957-1997
Bandon	608	Ireland	-	-	NI	-	1808	1975-1997
Deel	486	Ireland	-	-	NI	-	622	1983-1997
Maigue	1052	Ireland	-	-	NI	-	1397	1977-1997
Shannon Old Chan.	11700	Ireland	-	-	NI	-	4655	1932-1997
Shannon Tailrace		Ireland					13176	1932-1997
Fergus	1042	Ireland	-	-	NI	-	1657	1973-1997
	28672	**=Total of main Irish rivers discharging to the Celtic Sea**						
Corrib	3138	Ireland	-	-	NI	-	8447	1973-1997 (Excl. 86-90, 92-93)
Moy	2086	Ireland	-	-	NI	-	5054	1970-1997
Erne	4372	Ireland/UK	2572/1800	60/40	NI	-	8720	1951-1997
	9596	**=Total of main Irish rivers discharging to the Atlantic**						
Statistical Information provided by The Netherlands (with assistance from Germany and Belgium)								
Rhine	156500						166700	1911-1995
		Switzerland	9500	6	3.0	6		
		France	22000	14	3.7	7		
		Luxembourg	2500	2	0.3	1		
		Germany	100000	64	32.5	65		
		Netherlands	22500	14	10.9	21		
Meuse	34900						67800	1911-1995
		France	10000	29				
		Luxembourg	100	1				
		Belgium	13000	37				
		Germany	4000	11				
		Netherlands	7800	22	3.6			

Statistical Information on River Catchment Areas

River	Catchment area	Countries	Share in catchment area		Population (1990)		LTA*	LTA-period
	[km2]		[km2]	[%]	[10E6]	[%]	[1000 m3/d]	[a]
Scheldt	22004				~10		9331	1949-1995
		France	6680	30.00	~2.7	~27		
		Belgium	13324	61.00	6.9	69		
		Netherlands	2000	9.00	0.4	4		
Ems	15552						7630	1941-1995
		Germany	13152	85.00	3.75	85		
		Netherlands	2400	15.00	0.6	15		
Statistical Information provided by Norway:								
Glomma (1)	41918	Norway		100.00	0.62	100	60324	1961-1990
Drammenselva (2)	17034	Norway		100.00	0.2	100	26743	1961-1990
Numedalslågen (3)	5577	Norway		100.00	0.04	100	10082	1961-1990
Skienselva (4)	10772	Norway		100.00	0.11	100	22611	1961-1990
Otra (5)	3738	Norway		100.00	0.03	100	12841	1961-1990
	79039	**=Total of Norwegian rivers discharging to the Skagerrak**						
Orreelva (6)	105	Norway		100.00	0.01	100	333	1961-1990
Suldalslågen (7)	1457	Norway		100.00	0.003	100	7422	1961-1990
	1562	**=Total of Norwegian rivers discharging to the North Sea**						
Orkla (8)	3053	Norway		100.00	0.02	100	5374	1961-1990
Vefsna (9)	4122	Norway		100.00	0.01	100	15620	1961-1990
	7175	**=Total of Norwegian rivers discharging to the Norwegian Sea**						
Altaelva (10)	7373	Norway		100.00	0.005	100	7487	1961-1990
	7373	**=Total of Norwegian rivers discharging to the Barents Sea**						
Statistical Information provided by Portugal:								
Tejo	80629	Portugal	24860	30.8	2.89	32.0	15900	50
		Spain	55769	69.2	6.14	68.0	34800	50
Douro	97600	Portugal	18600	19.1	1.76	43.5	22500	50
		Spain	79000	80.9	2.28	56.5	40900	50
Miño/Minho	17000	Portugal	900	5.3	0.07	7.9	6000	15
		Spain	16100	94.7	0.86	92.1	29000	15
Statistical Information provided by Spain:								
Guadalquivir	63241	Spain	63241	100.0%	4.70		19808	1942-88
Guadiana	67122	Spain	55597	82.8%	1.67		4192	1975-94
		Portugal	11525	17.2%				
Miño	17247	Spain	16347	94.8%	0.88		18910	1975-95
		Portugal	900	5.2%				
Tajo	80190	Spain	55810	69.6%	2.28			
		Portugal	24380	30.4%				
Duero	97670	Spain	78960	80.8%	6.14			
		Portugal	18710	19.2%				
Statistical Information provided by Sweden:						1995		
Vege å (95)	498	-	-	-	0.04300	100	NI	NI
Rönne å (96)	1890	-	-	-	0.08810	100	1814	1931-1960
Stensån (97)	284	-	-	-	0.00710	100	NI	NI
Lagan (98)	6444	-	-	-	0.11890	100	6134	1931-1960
Genevadsån (99)	225	-	-	-	0.00470	100	NI	NI
Fylleån (100)	359	-	-	-	0.00900	100	NI	NI
Nissan (101)	2682	-	-	-	0.08280	100	3640	1931-1960
Suseån (102)	441	-	-	-	0.00760	100	NI	NI
Ätrån (103)	3343	-	-	-	0.06560	100	4260	1931-1960
Himleån (104)	214	-	-	-	0.00820	100	NI	NI
Viskan (105)	2201	-	-	-	0.12120	100	2678	1931-1960
Rolfsån (106)	723	-	-	-	0.02710	100	NI	NI
Kungsbackaån (107)	310	-	-	-	0.03740	100	NI	NI
Göta älv (108)	50230	Norway	7450.00	14.80	0.82190	ni	2678	1931-1960
	69,844	**=Total of Swedish rivers discharging to the Kattegat**						
Bäveån (109)	302	-	-	-	0.02130	100	289	1931-1960
Örekilsälven (110)	1327	-	-	-	0.01450	100	1620	1931-1960
Strömsån (111)	253	-	-	-	0.00490	100	NI	NI
Enningsdalsälven (112)	704	-	-	-	0.00319	100	1210	1931-1960
	2,586	**=Total of Swedish rivers discharging to the Skagerrak**						

Statistical Information on River Catchment Areas

River	Catchment area [km2]	Countries	Share in catchment area [km2]	[%]	Population (1990) [10E6]	[%]	LTA* [1000 m3/d]	LTA-period [a]
Statistical Information provided by the United Kingdom:								
Dionard (SC2b)	NI	-	-	-	NI	-	NI	NI
Hope (SC2b)	NI	-	-	-	NI	-	NI	NI
Borgie (SC2b)	NI	-	-	-	NI	-	NI	NI
Naver (SC2b)	NI	-	-	-	NI	-	NI	NI
Strathy (SC2b)	NI	-	-	-	NI	-	NI	NI
Halladale (SC2b)	NI	-	-	-	NI	-	NI	NI
Thurso (SC2b)	NI	-	-	-	NI	-	NI	NI
Wick (SC2b)	NI	-	-	-	NI	-	NI	NI
Dunbeath (SC2b)	NI	-	-	-	NI	-	NI	NI
Berriedale (SC2b)	NI	-	-	-	NI	-	NI	NI
Langwell (SC2b)	NI	-	-	-	NI	-	NI	NI
Helmsdale (SC2b)	NI	-	-	-	NI	-	NI	NI
Brora (SC2b)	NI	-	-	-	NI	-	NI	NI
Oykle (K.S.; SC2b)	NI	-	-	-	NI	-	NI	NI
Cassley (K.S.; SC2b)	NI	-	-	-	NI	-	NI	NI
Shin (K.S.; SC2a)	NI	-	-	-	NI	-	NI	NI
Carron (K.S.; SC2a)	NI	-	-	-	NI	-	NI	NI
Alness (SC2b)	NI	-	-	-	NI	-	NI	NI
Cannon (SC2b)	NI	-	-	-	NI	-	NI	NI
Beauly (SC2b)	NI	-	-	-	NI	-	NI	NI
Ness (SC2b)	NI	-	-	-	NI	-	7600	NI
Nairn (SC2b)	NI	-	-	-	NI	-	NI	NI
Findhorn (SC2b)	NI	-	-	-	NI	-	NI	NI
Spey (SC3)	NI	-	-	-	NI	-	5600	NI
Deveron (SC3)	NI	-	-	-	NI	-	NI	NI
Ugie (SC3)	NI	-	-	-	NI	-	NI	NI
Ythan (SC3)	NI	-	-	-	NI	-	NI	NI
Lossie (SC3)	NI	-	-	-	NI	-	NI	NI
Don (SC3)	NI	-	-	-	NI	-	NI	NI
Dee (SC3)	NI	-	-	-	NI	-	NI	NI
Bervie (SC3)	NI	-	-	-	NI	-	NI	NI
Dighty (SC4)	NI	-	-	-	NI	-	NI	NI
Earn (SC4)	NI	-	-	-	NI	-	NI	NI
Eden (SC4)	NI	-	-	-	NI	-	NI	NI
North Esk (SC4)	NI	-	-	-	NI	-	NI	NI
South Esk (SC4)	NI	-	-	-	NI	-	NI	NI
Lunan (SC4)	NI	-	-	-	NI	-	NI	NI
Tay (SC4)	NI	-	-	-	NI	-	14000	NI
Leven (SC5)	NI	-	-	-	NI	-	NI	NI
Black Devon (SC5)	NI	-	-	-	NI	-	NI	NI
Devon (SC5)	NI	-	-	-	NI	-	NI	NI
Allan (SC5)	NI	-	-	-	NI	-	NI	NI
Teith (SC5)	NI	-	-	-	NI	-	NI	NI
Forth (SC5)	NI	-	-	-	NI	-	4300	NI
Avon (SC5)	NI	-	-	-	NI	-	NI	NI
Carron (SC5)	NI	-	-	-	NI	-	NI	NI
Almond (SC5)	NI	-	-	-	NI	-	NI	NI
Leith (SC5)	NI	-	-	-	NI	-	NI	NI
Esk (SC5)	NI	-	-	-	NI	-	NI	NI
Tyne (SC5)	NI	-	-	-	NI	-	3900	NI
Whiteadder (SC5)	NI	-	-	-	NI	-	NI	NI
Eye (SC5)	NI	-	-	-	NI	-	NI	NI

Statistical Information on River Catchment Area								
River	Catchment area	Countries	Share in catchment area		Population (1990)		LTA*	LTA-period
	[km2]		[km2]	[%]	[10E6]	[%]	[1000 m3/d]	[a]
Tweed (E1)	NI	-	-	-	NI	-	NI	NI
Coquet (E1)	NI	-	-	-	NI	-	NI	NI
Wansbeck (E1)	NI	-	-	-	NI	-	NI	NI
Blyth (E1)	NI	-	-	-	NI	-	NI	NI
Tyne (E2)	NI	-	-	-	NI	-	NI	NI
Derwent (E2)	NI	-	-	-	NI	-	NI	NI
Team (E2)	NI	-	-	-	NI	-	NI	NI
Wear (E3)	NI	-	-	-	NI	-	NI	NI
Skerne (E5)	NI	-	-	-	NI	-	NI	NI
Tees (E5)	NI	-	-	-	NI	-	NI	NI
Aire (E7A)	NI	-	-	-	NI	-	NI	NI
Derwent (E7A)	NI	-	-	-	NI	-	NI	NI
Don (E7A)	NI	-	-	-	NI	-	NI	NI
Ouse (E7A)	NI	-	-	-	NI	-	NI	NI
Wharfe (E7A)	NI	-	-	-	NI	-	NI	NI
Ancholme (E7A)	NI	-	-	-	NI	-	NI	NI
Trent (E7A)	NI	-	-	-	NI	-	7800	NI
Idle (E7A)	NI	-	-	-	NI	-	NI	NI
Welland (E9)	NI	-	-	-	NI	-	NI	NI
Nene (E9)	NI	-	-	-	NI	-	NI	NI
Ouse (E9)	NI	-	-	-	NI	-	NI	NI
Witham (E9)	NI	-	-	-	NI	-	NI	NI
Glan (E9)	NI	-	-	-	NI	-	NI	NI
Hundred Foot River (E9)	NI	-	-	-	NI	-	NI	NI
Ten Mile River (E9)	NI	-	-	-	NI	-	NI	NI
Bure (E10)	NI	-	-	-	NI	-	NI	NI
Wensum (E10)	NI	-	-	-	NI	-	NI	NI
Stour (E10)	NI	-	-	-	NI	-	NI	NI
Gipping (E10)	NI	-	-	-	NI	-	NI	NI
Waveney (E10)	NI	-	-	-	NI	-	NI	NI
Yare (E10)	NI	-	-	-	NI	-	NI	NI
Colne (E11)	NI	-	-	-	NI	-	NI	NI
Chalmer (E11)	NI	-	-	-	NI	-	NI	NI
Blackwater (E11)	NI	-	-	-	NI	-	NI	NI
Thames (E12)	NI	-	-	-	NI	-	6700	NI
Beam (E12)	NI	-	-	-	NI	-	NI	NI
Beverley Brook (E12)	NI	-	-	-	NI	-	NI	NI
Brent (E12)	NI	-	-	-	NI	-	NI	NI
Crane (E12)	NI	-	-	-	NI	-	NI	NI
Ingrebourne (E12)	NI	-	-	-	NI	-	NI	NI
Lee (E12)	NI	-	-	-	NI	-	NI	NI
Ravensbourne (E12)	NI	-	-	-	NI	-	NI	NI
Roding (E12)	NI	-	-	-	NI	-	NI	NI
Wandle (E12)	NI	-	-	-	NI	-	NI	NI
		=Total of UK rivers discharging to the main body of the North Sea						

Statistical Information on River Catchment Areas

River	Catchment area [km2]	Countries	Share in catchment area [km2]	[%]	Population (1990) [10E6]	[%]	LTA* [1000 m3/d]	LTA-period [a]
Medway (E13)	NI	-	-	-	NI	-	NI	NI
Stour (E13)	NI	-	-	-	NI	-	1130	NI
Rother (E13)	NI	-	-	-	NI	-	NI	NI
Adur (E14)	NI	-	-	-	NI	-	NI	NI
Ouse (E14)	NI	-	-	-	NI	-	NI	NI
Cuckmere (E14)	NI	-	-	-	NI	-	NI	NI
Arun (E14)	NI	-	-	-	NI	-	NI	NI
Itchen (E15)	NI	-	-	-	NI	-	NI	NI
Test (E15)	NI	-	-	-	NI	-	NI	NI
Blackwater (E15)	NI	-	-	-	NI	-	NI	NI
Frome (E16)	NI	-	-	-	NI	-	NI	NI
Stour (E16)	NI	-	-	-	NI	-	NI	NI
Avon (E16)	NI	-	-	-	NI	-	1330	NI
Axe (E17)	NI	-	-	-	NI	-	NI	NI
Dart (E17)	NI	-	-	-	NI	-	NI	NI
Exe (E17)	NI	-	-	-	NI	-	1360	NI
Gara (E17)	NI	-	-	-	NI	-	NI	NI
Otter (E17)	NI	-	-	-	NI	-	NI	NI
Teign (E17)	NI	-	-	-	NI	-	NI	NI
Cober (E18)	NI	-	-	-	NI	-	NI	NI
Erme (E18)	NI	-	-	-	NI	-	NI	NI
Fal (E18)	NI	-	-	-	NI	-	NI	NI
Fowey (E18)	NI	-	-	-	NI	-	NI	NI
Gara (E18)	NI	-	-	-	NI	-	NI	NI
Lynher (E18)	NI	-	-	-	NI	-	NI	NI
Par (E18)	NI	-	-	-	NI	-	NI	NI
Plym (E18)	NI	-	-	-	NI	-	NI	NI
Porthleven (E18)	NI	-	-	-	NI	-	NI	NI
St Austel (E18)	NI	-	-	-	NI	-	NI	NI
Tavy (E18)	NI	-	-	-	NI	-	NI	NI
Tamar (E18)	NI	-	-	-	NI	-	1940	NI
		=Total of UK rivers discharging to the Channel (North Sea)						
Camel (E19)	NI	-	-	-	NI	-	NI	NI
Hayle (E19)	NI	-	-	-	NI	-	NI	NI
Menalhyl (E19)	NI	-	-	-	NI	-	NI	NI
Red River (E19)	NI	-	-	-	NI	-	NI	NI
Taw (Yeo) (E19)	NI	-	-	-	NI	-	NI	NI
Taw (2) (E20)	NI	-	-	-	NI	-	NI	NI
Torridge (E20)	NI	-	-	-	NI	-	NI	NI
Parrett (E21)	NI	-	-	-	NI	-	NI	NI
Tone (E21)	NI	-	-	-	NI	-	NI	NI
Bristol Avon (E22)	NI	-	-	-	NI	-	NI	NI
Severn (2) (E22)	NI	-	-	-	NI	-	9100	NI
Wye (E23)	NI	-	-	-	NI	-	6200	NI
Usk (E23)	NI	-	-	-	NI	-	NI	NI
Rhymney (E23)	NI	-	-	-	NI	-	NI	NI
Ely (E23)	NI	-	-	-	NI	-	NI	NI
Afon Lwyd (E23)	NI	-	-	-	NI	-	NI	NI
Ebbw Fawr (E23)	NI	-	-	-	NI	-	NI	NI
Taff (E23)	NI	-	-	-	NI	-	NI	NI
Cadoxton (E24)	NI	-	-	-	NI	-	NI	NI
Neath (E24)	NI	-	-	-	NI	-	NI	NI
Ogmore (E24)	NI	-	-	-	NI	-	NI	NI
Thaw (E24)	NI	-	-	-	NI	-	NI	NI
Tawe (E24)	NI	-	-	-	NI	-	NI	NI
Ewenny (E24)	NI	-	-	-	NI	-	NI	NI
Nant Y Fendrod (E24)	NI	-	-	-	NI	-	NI	NI
Thaw Kenson (E24)	NI	-	-	-	NI	-	NI	NI
Dafen (E25)	NI	-	-	-	NI	-	NI	NI
W Cleddau (E25)	NI	-	-	-	NI	-	NI	NI
Tywi (E25)	NI	-	-	-	NI	-	3700	NI
Taf (E25)	NI	-	-	-	NI	-	NI	NI
Loughor (E25)	NI	-	-	-	NI	-	NI	NI
		=Total of UK rivers discharging to the Celtic Sea						

Statistical Information on River Catchment Area								
River	Catchment area	Countries	Share in catchment area		Population (1990)		LTA*	LTA-period
	[km2]		[km2]	[%]	[10E6]	[%]	[1000 m3/d]	[a]
Statistical Information provided by the United Kingdom (continued):								
Teifi (E26)	NI	-	-	-	NI	-	NI	NI
Ystwyth (E26)	NI	-	-	-	NI	-	NI	NI
Rheidol (E26)	NI	-	-	-	NI	-	NI	NI
Mawddach (E26)	NI	-	-	-	NI	-	NI	NI
Dyfi (E26)	NI	-	-	-	NI	-	NI	NI
Glaslyn (E26)	NI	-	-	-	NI	-	NI	NI
Afon Goch (2) (E27)	NI	-	-	-	NI	-	NI	NI
Clwyd (E27)	NI	-	-	-	NI	-	NI	NI
Cefni (E27)	NI	-	-	-	NI	-	NI	NI
Conwy (E27)	NI	-	-	-	NI	-	NI	NI
Dee (E27)	NI	-	-	-	NI	-	3020	NI
Nant Glywdyr (E27)	NI	-	-	-	NI	-	NI	NI
Alt (E28)	NI	-	-	-	NI	-	NI	NI
Mersey (E28)	NI	-	-	-	NI	-	3540	NI
Weaver (E28)	NI	-	-	-	NI	-	NI	NI
Darwen (E29)	NI	-	-	-	NI	-	NI	NI
Douglas (E29)	NI	-	-	-	NI	-	NI	NI
Ribble (E29)	NI	-	-	-	NI	-	NI	NI
Kent (E29)	NI	-	-	-	NI	-	NI	NI
Lune (E29)	NI	-	-	-	NI	-	3020	NI
Wyre (E29)	NI	-	-	-	NI	-	NI	NI
Leven (E29)	NI	-	-	-	NI	-	NI	NI
Derwent (E30)	NI	-	-	-	NI	-	NI	NI
Eden (E30)	NI	-	-	-	NI	-	4320	NI
Liddel (SC1)	NI	-	-	-	NI	-	NI	NI
Esk (SC1)	NI	-	-	-	NI	-	NI	NI
Kirtle (SC1)	NI	-	-	-	NI	-	NI	NI
Annan (SC1)	NI	-	-	-	NI	-	NI	NI
Nith (SC1)	NI	-	-	-	NI	-	NI	NI
Urr (SC1)	NI	-	-	-	NI	-	NI	NI
Dee (SC1)	NI	-	-	-	NI	-	NI	NI
Cree (SC1)	NI	-	-	-	NI	-	NI	NI
Bladnoch (SC1)	NI	-	-	-	NI	-	NI	NI
Luce (SC1)	NI	-	-	-	NI	-	NI	NI
Piltanton (SC1)	NI	-	-	-	NI	-	NI	NI
Newry (NI2)	NI				NI	-	NI	NI
Quoile (NI2)	NI				NI	-	NI	NI
Lagan (NI2)	NI				NI	-	NI	NI
		=Total of UK rivers discharging to the Irish Sea						

Statistical Information on River Catchment Area								
River	Catchment area	Countries	Share in catchment area		Population (1990)		LTA*	LTA-period
	[km2]		[km2]	[%]	[10E6]	[%]	[1000 m3/d]	[a]
Statistical Information provided by the United Kingdom (continued):								
Clyde (SC2)	NI	-	-	-	NI	-	4000	NI
Kelvin (SC2)	NI	-	-	-	NI	-	NI	NI
White Cart (SC2)	NI	-	-	-	NI	-	NI	NI
Black Cart (SC2)	NI	-	-	-	NI	-	NI	NI
Leven (SC2)	NI	-	-	-	NI	-	NI	NI
Garnock (SC2)	NI	-	-	-	NI	-	NI	NI
Lugton (SC2)	NI	-	-	-	NI	-	NI	NI
Annick (SC2)	NI	-	-	-	NI	-	NI	NI
Irvine (SC2)	NI	-	-	-	NI	-	NI	NI
Ayr (SC2)	NI	-	-	-	NI	-	NI	NI
Doon (SC2)	NI	-	-	-	NI	-	NI	NI
Girvan (SC2)	NI	-	-	-	NI	-	NI	NI
Stinchar (SC2)	NI	-	-	-	NI	-	NI	NI
Leven (SC2a)	NI	-	-	-	NI	-	NI	NI
Nevis (SC2a)	NI	-	-	-	NI	-	NI	NI
Lochy (SC2a)	NI	-	-	-	NI	-	5400	NI
Shiel (Sunart; SC2a)	NI	-	-	-	NI	-	NI	NI
Ailort (SC2a)	NI	-	-	-	NI	-	NI	NI
Morar (SC2a)	NI	-	-	-	NI	-	NI	NI
Shiel (G.S.; SC2a)	NI	-	-	-	NI	-	NI	NI
Elchaig (SC2a)	NI	-	-	-	NI	-	NI	NI
Ling (SC2a)	NI	-	-	-	NI	-	NI	NI
Carron (N.K.; SC2a)	NI	-	-	-	NI	-	NI	NI
Ewe (SC2a)	NI	-	-	-	NI	-	NI	NI
Little Gruinad (SC2a)	NI	-	-	-	NI	-	NI	NI
Gruinard (SC2a)	NI	-	-	-	NI	-	NI	NI
Broom (SC2a)	NI	-	-	-	NI	-	NI	NI
Ullapool (SC2a)	NI	-	-	-	NI	-	NI	NI
Inver (SC2a)	NI	-	-	-	NI	-	NI	NI
Laxford (SC2b)	NI	-	-	-	NI	-	NI	NI
Bush (NI1)	NI				NI		NI	NI
Bann (NI1)	NI				NI		7900	NI
Roe (NI1)	NI				NI		NI	NI
Faughan (NI1)	NI				NI		NI	NI
Burn Dennet NI1	NI				NI		NI	NI
Mourne (NI1)	NI				NI		NI	NI
Finn (NI1)	NI				NI		NI	NI
		=Total of UK rivers discharging to the Atlantic						

***) LTA = Long-term average**

Annex 1

BELGIUM

Annual report on riverine inputs and direct discharges to Convention waters during the year 1997 by Belgium[1]

Table 6a. Main riverine inputs

Table 6b. Tributary riverine inputs

Table 7. Contaminant concentrations

Table 8. Detection limits

Table 9. Catchment dependent information

[1] All comments / footnotes referred to and relating to Tables 6 – 9 are included in this text report.

Annual report on riverine inputs and direct discharges by Belgium to Convention waters during the year 1997

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A. General information

Table 1: General overview of river systems (for riverine inputs) and direct discharge areas (for direct discharges) included in the data report

Country: **BELGIUM**

Name of river, subarea and discharge area[1]	Nature of the receiving water[2]	optional: national reference number	Optional: map reference number
Belgian Coastal zone			
Western area (23 km)	Coastal water		
Middle area (20 km)	Coastal water		
Eastern area (22 km)	Coastal water		
Scheldt estuary			
Scheldt river	Estuary tidal range ~4m		
Ghent-Terneuzen canal	Estuary tidal range ~4m		

[1] i.e. name of estuary or length of coastline
[2] i.e. estuary or coastal water; if an estuary, state the tidal range and the daily flushing volume

B. Total riverine inputs and direct discharges for the year 1997

B.1 Comments on the Total Riverine Inputs and Direct Discharges:

Source of data, except for Mercury: **Vlaamse Milieumaatschappij (VMM), A. Van De Maelestraat 96, B-9320 Erembodegem.**

Source of data for Mercury**: Rijks Instituut voor Kust en Zee, Rijkswaterstaat, The Netherlands.**

C. Direct discharges for the year 1997

Sewage Effluents (Table 5a.)

C.1 Describe the methods of measurement and calculation used, including information on the number of samples and the concentration upon which the measurement is based (ref.: Section 6 of the Principles), including for those under voluntary reporting:

No sewage effluents were discharged directly in 1997. Previously existing sources no longer exist.

C.2 Describe the determinants, other than those specified in paragraph 2.1 of the Principles, that are included in the current monitoring programme and which may be relevant for the Comprehensive Study on Riverine Inputs and Direct Discharges (voluntary reporting):

[none]

Industrial Effluents (Table 5b.)

C.3 Describe the methods of measurement and calculation used, including information on the number of samples and the concentration upon which the measurement is based (ref.: Section 6 of the Principles), including for those under voluntary reporting:

No industrial effluents were discharged directly in 1997. Previously existing sources no longer exist.

C.4 Give any other relevant information (e.g. proportion of substance discharged as insoluble material):

[none]

C.5 Give any available information on other discharges directly to Convention Waters - through e.g. urban run-off and stormwater overflows - that are not covered by the data in tables 5a. and 5b.:

No urban run-off or stormwater overflows discharge to Convention Waters under Belgian jurisdiction.

C.6 Describe the determinants, other than those specified in paragraph 2.1 of the Principles, that are included in the current monitoring programme and which may be relevant for the Comprehensive Study on Riverine Inputs and Direct Discharges (voluntary reporting):

[none]

D. Riverine inputs for the year 1997

Main Rivers (Tables 6a. and 7.)

D.1 Describe the methods of measurement and calculation used, including information on the number of samples and the concentration (Table 7.) upon which the measurement is based (ref.: Section 5 of the Principles), including for those under voluntary reporting:

No information on the methods of measurement is available at this moment. The Number of samples is reported in Table 7 for every determinant.

For the calculation of the standard deviation of the sets of determinant concentrations, all concentrations lower than the detection limit were taken as half the value of the detection limit. When all measurements were beneath the detection limit no calculation for this parameter was made and the value reported was "NI" (No Information).

Coastal Area

Due to the lack of flow rate data, the discharges of the IJzer were calculated using the formula proposed under point 5.12 of the "Principles of the Comprehensive Study on Riverine Inputs and Direct Discharges (RID)":

$$\frac{Qr\sum_{i=1}^{n} Ci}{n}$$

Where: Qr is an estimated LTA flow rate

Ci is the concentration measured in sample i

Ref. (1) table 6a and 7: total-N load = sum of loads of NO2-N, NO3-N, and Kjeldahl-N.
Ref. (5) table 7: the detection limit was reached, a nominal minimum concentration could not be detected. Consequently, the fields in the rows labelled "minimum" were given the value "ND" (Not Detected). See also section E.1

Scheldt estuary

The fresh water flow rates for the Scheldt, determined at station 'Schelle', were multiplied by an empirically determined correction factor of 1.15 to include fresh water inputs between 'Schelle' and 'Doel'. ***Source of data: Flemish Region, Department of Environment & Infrastructure, Waterways and Maritime Affairs Administration, Maritime Section Scheldt****.*

The loads of the Scheldt were calculated using the formula proposed under point 5.11 of the "Principles of the Comprehensive Study on Riverine Inputs and Direct Discharges (RID)":

$$\frac{Qr\sum_{i=1}^{n}(CiQi)}{\sum_{i=1}^{n}(Qi)}$$

Where: Qr is the mean flow rate for 1997

Qi is the mean flow rate of the ten day period during which sample I was taken

Ci is the concentration measured in sample i

Ref. (2) tables 6a and 7:PCB-load = sum of loads of individual congeners
Ref. (1) tables 6a and 7: total-N load = sum of loads of NO_2-N, NO_3-N, and Kjeldahl-N.
Ref. (5) table 7: the detection limit was reached, a nominal minimum concentration could not be detected. Consequently, the fields in the rows labelled "minimum" were given the value "ND" (Not Detected). See also section E.1
Ref. (6) table 7: all measurements were beneath the detection limit, a nominal maximum concentration could not be detected. Consequently, the fields in the rows labelled "maximum" were given the value "ND" (Not Detected). See also section E.1

Loads are calculated twice: once with and once without salinity correction on the concentration data (for explanation see the Belgian report on 1990 inputs). In addition, where detection limits were reached, loads were calculated twice more: once with a concentration "zero" and once with a concentration set equal to the nominal value of the detection limit. The highest and the lowest results of these calculations were then reported for every substance as upper and lower limits. The 'real' pollutant load is currently estimated between these two figures. No information on the precision of the measurement is available.

The formula for the salinity correction of a concentration figure is:

$$C_{corrected} = \frac{(18000 \times C_{measured})}{(18000 - [chloride])}$$

This formula assumes that the chloride content of fresh water is close to zero.

D.2 Give any other relevant information (e.g. proportion of substance transported by the river in particulate form):

[none]

D.3 Describe the determinants, other than those specified in paragraph 2.1 of the Principles, that are included in the current monitoring programme and which may be relevant for the Comprehensive Study on Riverine Inputs and Direct Discharges (voluntary reporting):

Other determinants available for the IJzer river are: Dissolved Oxygen, nitrites (NO_2), Conductivity, Chlorides (Cl).

For the Scheldt river other available determinants are: pH, Dissolved Oxygen, Chemical Oxigen Demand (COD), Biological Oxygen Demand (BOD), nitrites (NO2), Conductivity, Chlorides (Cl), sulfates (SO4), Cromium (Cr) and Nickel (Ni) and the following organochlore, organonitrogen and organophosphorous pesticides: 2,3,4,5-tetrachloornitrobenzene; 2,3,4,6-tetrachloornitrobenzene; Endosulfan; Hexachloorcyclohexane, alpha; Aldrin; tAzinfos-ethyl; Alinfos-methyl; Endosulfan,beta; Bromofos-ethyl; Bromofos-methyl; Chlorofenvinfos; Heptachloorepoxyde (cis); Chloropyrifos-ethyl; Chloropyrifos-methyl; Diazinone; Toxafene; Hexachlorocyclohexane, delta; Dieldrin; Dimethoate; exachlorocyclohexane, epsilon; Endosulfan, sulfate; Endrin aldehyde; Endrin; Fenitrothion; Fenthion; Hexachlorocyclohexane, gamma; Oxydemetone-mthyl; Heptachloro; Malathion ; Methidation; Mevinfos; Methoxychlore; op'dichlorodifenyldichloroethane; op'dichlorodifenyldichloroethene; op'dichlorodifenyl-trichloroethane; Parathion; Parathion-methyl; Pentachloronitrobenzene; Pirimifos-methyl; pp'dichlorodifenyldichloroethane; pp'dichloro-difenyltrichloroethane; pp'dichlorodifenyl-dichloroethene; Telodrin; Heptachloroepoxyde(trans); Trifluraline; Diuron.

Tributary Rivers (Tables 6b. and 7.)

D.4 Describe the methods of measurement and calculation used, including information on the number of samples and the concentration (Table 7b.) upon which the measurement is based (ref.: Section 5 of the Principles):

No information on the methods of measurement is available at this moment. The number of samples is reported in Table 7 for every determinant.

For the calculation of the standard deviation of the sets of determinant concentrations, all concentrations lower than the detection limit were taken as half the value of the detection limit. When all measurements were beneath the detection limit no calculation for this parameter was made and the value reported was "NI" (No Information).

Coastal Area

No information on the methods of measurement is available at this moment. The number of samples is reported in Table 7 for every determinant.

Due to the lack of flow rate data, the discharges of the different canals and polders of the coastal zone were calculated using the formula proposed under point 5.12 of the "Principles of the Comprehensive Study on Riverine Inputs and Direct Discharges (RID)":

$$\frac{Qr\sum_{i=1}^{n} Ci}{n}$$

Where: Qr is an estimated LTA flow rate for the water course under consideration

Ci is the concentration measured in sample i

Ref. (2) tables 6b and 7:PCB-load = sum of loads of individual congeners
Ref. (1) tables 6b and 7: total-N load = sum of loads of NO_2-N, NO_3-N, and Kjeldahl-N.

Ref. (3) tables 6b and 7: Kjeldahl-N was not monitored, NH4-N, NO2-N and NO3-N were summed as a best estimate for total N.
Ref. (4) tables 6b and 7: No emissions downstream from the regular sampling points were taken into account as in foregoing years.
Ref. (5) table 7: the detection limit was reached, a nominal minimum concentration could not be detected. Consequently, the fields in the rows labelled "minimum" were given the value "ND" (Not Detected). See also section E.1
Ref. (6) table 7: all measurements were beneath the detection limit, a nominal maximum concentration could not be detected. Consequently, the fields in the rows labelled "maximum" were given the value "ND" (Not Detected). See also section E.1
Ref (7) tables 6b and 7: emissions only; no regular monitoring point available.
Ref (8) tables 6b and 7: inputs calculated on the basis of total emission flow rate.
Ref (9) tables 6b and 7: some emissions downstream from the regular monitoring point are lacking.

Previously existing emissions downstream the regular monitoring sites have been eliminated except for emissions on the Duinkerke-Nieuwpoort canal (not comprised in this report), the Boudewijn canal and the Lissewege vaart.

For the Boudewijn canal no flow rate data are available. The total flow rate was estimated to be aproximately equal to the sum of the emission flow rates.

All concentrations were measured in fresh water reaches. Therefore salinity was nowhere monitored nor was a correction for salinity necessary.

Scheldt estuary

The fresh water flow rates for the Ghent-Terneuzen canal were obtained from ***the Ministry of the Flemish Community, Department of Environment and Infrastructure, Waterways and Maritime Affairs Administration, Upper Scheldt Section****.*

The loads of the Ghent-Terneuzen canal were calculated using the formula proposed under point 5.11 of the "Principles of the Comprehensive Study on Riverine Inputs and Direct Discharges (RID)":

$$\frac{Qr\sum_{i=1}^{n}(CiQi)}{\sum_{i=1}^{n}(Qi)}$$

Where: Qr is the mean flow rate for 1997, evaluated on a daily basis

Qi is the flow rate on the sampling day i

Ci is the concentration measured in the sample taken at day i

Ref. (2) tables 6b and 7:PCB-load = sum of loads of individual congeners
Ref. (1) tables 6b and 7: total-N load = sum of loads of NO_2-N, NO_3-N, and Kjeldahl-N.
Ref. (5) table 7: the detection limit was reached, a nominal minimum concentration could not be detected. Consequently, the fields in the rows labeled "minimum" were given the value "ND" (Not Detected). See also section E.1
Ref. (6) table 7: all measurements were beneath the detection limit, a nominal maximum concentration could not be detected. Consequently, the fields in the rows labelled "maximum" were given the value "ND" (Not Detected). See also section E.1

The same corrections with respect to the detection limits and salinity were applied as explained under D1.

D.5 Give any other relevant information (e.g. proportion of substance transported by the river in particulate form):

[none]

D.6 Describe the determinants, other than those specified in paragraph 2.1 of the Principles, that are included in the current monitoring programme and which may be relevant for the Comprehensive Study on Riverine Inputs and Direct Discharges (voluntary reporting):

Other determinants available for the Ghent-Terneuzen canal are are: pH, Dissolved Oxygen, Chemical Oxygen Demand (COD), Biological Oxygen Demand (BOD), nitrites (NO_2), Nitrates (NO_3), Chlorides (Cl), Conductivity, sulfates (SO_4) and Cromium (Cr) and the 7determinants enumerated under point D.3.

For the following water courses of the coastal zone the same determinants are available: the Leopold canal, the Schipdonk canal, the Gent-Oostende canal and the Blankenbergse vaart.

D.7 Give any available information on other inputs - through e.g. polder effluents or from coastal areas - that are not covered by data in tables 6a. and 6b.:

[none]

E. Limits of detection

E.1 Information concerning limits of detection should be presented in Table 8 that includes different columns for rivers/tributaries, sewage effluents and industrial effluents. Any important comments may be presented here.

Information about the limits of detection given by the monitoring authority is rather poor. In most cases the limits reported in table 8 had to be deduced from the measurements themselves. When for a given determinant no one measurement was beneath the detection limit, consequently this limit could not be deduced. Values for these determinants are then reported "NI" (No Information).

As samples from the same locality sometimes have more than one detection limit for the same determinant, it was necessary to mention 2 figures, the minimum and the maximum detection limits, in one field in text format.

Another fact to be stated is that some of those limits are rather high (e.g. Cd, Zn, Cu, Pb, PCB). Consequently, very often more than 30% of the measurements are under those limits. Whenever a measurement is beneath the limit of detection, there is no information about the lowest value measured, and the minimum values in table 7 are reported as "ND" (not detected). The same reasoning was applied to the highest values when all measurements are under the limit of detection. In that case there is no information about a maximum concentration and this value is reported as "ND" (not detected). See also the references in sections D.1 and D.4

Further, as a consequence of the higher limits of detection, there is sometimes a huge spread between the calculated upper and lower limits of the loads.

F. National comments

F.1 Give a general summary of the main results as presented in the tables 5, 6 and 7 and comment, as appropriate, on these results.

[none]

F.2 Indicate any significant change in inputs and concentrations in comparison to previous years. Comment on these changes as appropriate.

From 1997 on, all direct sources have been eliminated. Only minor discharges (emissions) are lacking as stated under point D4.

Table 6a. Main Riverine Inputs
Reported Maritime Area of the OSPAR Convention in 1997 by Belgium

			Cd [t]	Hg [t]	Cu [t]	Pb [t]	Zn [t]	g-HCH [kg]	PCB [kg]	NH4-N [kt]	NO3-N [kt]	PO4-P [kt]	Total N [kt]	Total P [kt]	SPM [kt]
243	Ijzer	lower	0.007		0.9	0.3	9.0			0.3	2.9	0.1	3.7	0.2	4.9
		upper	0.03		0.9	0.4	9.0			0.3	2.9	0.1	3.7	0.2	4.9
		comment													
238	Coastal Area	lower	0.007		0.9	0.3	9.0			0.3	2.9	0.1	3.7	0.2	4.9
		upper	0.03		0.9	0.4	9.0			0.3	2.9	0.1	3.7	0.2	4.9
		comment											Ref. (1) in Annual Report 1997(2)		
102	Schelde	lower	0.000	0.2	22	16	261	37	0.000	2.0	13	0.7	19	0.9	205
		upper	4.5	0.3	55	55	385	55	99	3.9	19	1.3	28	4.6	293
		comment											(1)		
245	Schelde Basin	lower	0.000	0.2	22	16	261	37	0.000	2.0	13	0.7	19	0.9	205
		upper	4.5	0.3	55	55	385	55	99	3.9	19	1.3	28	4.6	293
		comment							(2)				(1)		
79	North Sea (BE)	lower	0.007	0.2	23	16	270	37	0.000	2.3	16	0.8	23	1.1	210
		upper	4.5	0.3	56	55	394	55	99	4.2	22	1.4	32	4.8	298
		comment							(2)				(1)		

Table 6b. Tributary Riverine Inputs
Reported Maritime Area of the OSPAR Convention in 1997 by Belgium

			Cd [t]	Hg [t]	Cu [t]	Pb [t]	Zn [t]	g-HCH [kg]	PCB [kg]	NH4-N [kt]	NO3-N [kt]	PO4-P [kt]	Total N [kt]	Total P [kt]	SPM [kt]
247	Beverdijk	lower	0.002		0.09	0.04	0.9			0.01	0.1	0.009	0.2	0.02	0.7
		upper	0.004		0.09	0.04	0.9			0.01	0.1	0.01	0.2	0.02	0.7
		comment											(1)		
246	Langeleed	lower	0.001		0.03	0.04	0.5			0.08	0.05	0.01	0.1	0.02	0.2
		upper	0.002		0.03	0.04	0.5			0.08	0.05	0.01	0.1	0.02	0.2
		comment											(3)		
239	Western Coastal Area	lower	0.002		0.1	0.07	1.5			0.09	0.2	0.02	0.3	0.04	0.9
		upper	0.006		0.1	0.07	1.5			0.09	0.2	0.02	0.3	0.04	0.9
		comment	(4)	(4)	(4)	(4)	(4)	(4)	(4)	(4)	(4)	(4)	(1)(3)(4	(4)	(4)
255	Blankenbergse vaart	lower	0.000		0.04	0.02	0.6	0.2	0.000	0.01	0.009	0.006	0.06	0.01	0.4
		upper	0.002		0.04	0.02	0.6	0.2	0.4	0.01	0.01	0.006	0.06	0.01	0.4
		comment							(2)				(1)		
251	Boudewijn canal	lower	0.1	0.005	0.2	0.2	0.9	0.3	0.000		0.07		0.8	0.03	0.4
		upper	0.1	0.005	0.2	0.2	0.9	0.3	0.09		0.07		0.8	0.03	0.4
		comment	(7)	(7)	(7)	(7)	(7)	(8)	(8)		(7)		(7)	(7)	(7)
252	Leopold canal	lower	0.005		0.3	0.3	5.7	1.9	0.000	0.3	0.3	0.1	0.6	0.2	1.7
		upper	0.016		0.4	0.3	5.7	1.9	3.2	0.3	0.3	0.1	0.6	0.2	1.8
		comment							(2)				(3)		
256	Lissewege vaart	lower			0.001	0.001	0.006								0.001
		upper			0.001	0.001	0.006								0.001
		comment			(7)	(7)	(7)								(7)
254	Schipdonk canal	lower						5.0	0.000	1.1	1.2	0.2	2.5	0.3	
		upper						5.2	6.5	1.1	1.2	0.2	2.5	0.3	
		comment							(2)				(3)		

242	Eastern Coastal Area	lower	0.1	0.005	0.6	0.5	7.2	7.4	0.000	1.4	1.6	0.4	3.8	0.5	2.5
		upper	0.1	0.005	0.6	0.5	7.2	7.7	10.1	1.4	1.6	0.4	3.9	0.5	2.6
		comment							(2)				(1)(3)		
249	Gent-Oostende canal	lower	0.008		0.8	0.4	9.4	5.5	0.000	1.2	0.7	0.2	2.0	0.2	1.8
		upper	0.020		0.8	0.4	9.4	5.5	5.9	1.2	0.7	0.2	2.0	0.2	1.8
		comment							(2)				(3)		
241	Middle Coastal Area	lower	0.008		0.8	0.4	9.4	5.5	0.000	1.2	0.7	0.2	2.0	0.2	1.8
		upper	0.02		0.8	0.4	9.4	5.5	5.9	1.2	0.7	0.2	2.0	0.2	1.8
		comment							(2)				(3)		
238	Coastal Area	lower	0.1	0.005	1.5	1.0	18	13	0.000	2.7	2.5	0.6	6.2	0.8	5.2
		upper	0.1	0.005	1.5	1.0	18	13	16	2.7	2.5	0.6	6.2	0.8	5.3
		comment	(9)	(9)	(9)	(9)	(9)	(9)	(2)(9)	(9)	(9)	(9)	(1)(3)(9	(9)	(9)
244	Gent-Ter	lower	0.000		1.2	0.6	36	6.2	0.000	1.6	2.8	0.4	5.3	0.7	5.2
		upper	0.5		6.0	5.6	44	7.9	17	1.9	3.2	0.4	6.2	0.8	6.1
		comment							(2)				(1)		
245	Schelde Basin	lower	0.000		1.2	0.6	36	6.2	0.000	1.6	2.8	0.4	5.3	0.7	5.2
		upper	0.5		6.0	5.6	44	7.9	17	1.9	3.2	0.4	6.2	0.8	6.1
		comment							(2)				(1)		
79	North Sea (BE)	lower	0.1	0.005	2.7	1.6	54	19	0.000	4.3	5.2	1.0	11	1.4	10
		upper	0.7	0.005	7.5	6.6	62	21	33	4.6	5.7	1.0	12	1.6	11
		comment	(9)	(9)	(9)	(9)	(9)	(9)	(2)(9)	(9)	(9)	(9)	(1)(3)(9	(9)	(9)

Table 7. Contaminant Concentration
Reported Maritime Area of the OSPAR Convention in 1997 by Belgium

			Cd [µg/l]	Hg [µg/l]	Cu [µg/l]	Pb [µg/l]	Zn [µg/l]	g-HCH [ng/l]	PCB [ng/l]	NH4-N [mg/l]	NO3-N [mg/l]	PO4-P [mg/l]	Total N [mg/l]	Total P [mg/l]	SPM [mg/l]
247	Beverdijk	lower													
		upper													
		minimum	ND		ND	0.685	19.77			ND	ND	ND	1.19	0.1	11
		maximum	0.396		8.81	2.507	76.80			1.39	15.38	0.84	18.44	1.65	55
		more than 70% > D.L.	no		yes	yes	yes			yes	no	yes	yes	yes	yes
		n	11		11	11	11			11	11	10	11	11	11
		info	(5)		(5)					(5)	(5)	(5)	(1)		
		st.Dev.	0.11		2.55	0.62	18.00			0.48	5.66	0.30	5.90	0.45	12.27
243	Ijzer	lower													
		upper													
		minimum	ND		2.521	ND	24.29			ND	2.05	0.1	5.57	0.54	11
		maximum	0.211		6.684	3	107.91			3.78	28.24	1.71	32.1	2.35	39
		more than 70% > D.L.	no		yes	yes	yes			yes	yes	yes	yes	yes	yes
		n	11		11	11	11			11	11	9	11	10	11
		info	(5)			(5)				(5)			(1)		
		st.Dev.	0.05		1.17	0.93	23.56			1.31	8.89	0.57	8.72	0.56	9.80
246	Langeleed	lower													
		upper													
		minimum	ND		1.899	1.781	28.38			0.43	ND	0.58	0.77	0.71	ND
		maximum	0.412		6.328	9.482	122.99			33.45	30.23	3.47	42.75	8.31	63
		more than 70% > D.L.	no		yes	yes	yes			yes	yes	yes	yes	yes	yes
		n	6		7	7	7			7	7	7	7	7	7
		info	(5)								(5)		(3)		(5)
		st.Dev.	0.14		1.55	2.56	36.45			11.84	10.95	0.98	17.52	2.63	21.51
239	Western Coastal Area	lower													
		upper													
		minimum	ND		ND	ND	19.77			ND	ND	ND	0.77	0.10	ND
		maximum	0.412		8.81	9.482	122.99			33.45	30.23	3.47	42.75	8.31	63
		more than 70% > D.L.	no		yes	yes	yes			yes	yes	yes	yes	yes	yes
		n	28		29	29	29			29	29	26	29	28	29
		info	(4), (5)	(4)	(4), (5)	(4), (5)	(4)	(4)	(4)	(4), (5)	(4), (5)	(4), (5)	(1), (3), (4)	(4)	(4), (5)
		st.Dev.	0.10		1.92	1.74	25.55			6.36	9.23	0.76	11.20	1.48	13.83

			Cd [µg/l]	Hg [µg/l]	Cu [µg/l]	Pb [µg/l]	Zn [µg/l]	g-HCH [ng/l]	PCB [ng/l]	NH4-N [mg/l]	NO3-N [mg/l]	PO4-P [mg/l]	Total N [mg/l]	Total P [mg/l]	SPM [mg/l]
255	Blankenbergse vaart	lower													
		upper													
		minimum	ND		1.409	ND	22.15	3	ND	ND	ND	0.1	1.15	0.17	10
		maximum	ND		7.062	4.744	93.11	42	ND	3	2.68	0.76	8.17	1.2	103
		more than 70% > D.L.	no		yes	yes	yes	yes	no	yes	no	yes	yes	yes	yes
		n	10		10	10	10	6	6	10	10	9	10	9	10
		info	(5)			(5)			(2), (5), (6)	(5)	(5)		(1)		
		st.Dev.	NI		1.66	1.39	20.75	18.57	NI	1.15	0.92	0.25	1.91	0.38	27.18
251	Boudewijn canal	lower													
		upper													
		minimum	NI	NI	NI	NI	NI	5	0		NI		NI	NI	NI
		maximum	NI	NI	NI	NI	NI	28	0.095		NI		NI	NI	NI
		more than 70% > D.L.	NI	NI	NI	NI	NI	yes	no		NI		NI	NI	NI
		n	NI	NI	NI	NI	NI	6	6		NI		NI	NI	NI
		info	(7)	(7)	(7)	(7)	(7)	(8)	(8)		(7)		(7)	(7)	(7)
		st.Dev.	NI	NI	NI	NI	NI	8.43	NI		NI		NI	NI	NI
252	Leopold canal	lower													
		upper													
		minimum	ND		ND	ND	35.48	ND	ND	0.1	0.2	0.39	0.47	0.54	ND
		maximum	0.306		5.891	5.636	102.20	39	ND	5.57	8.02	2.45	10.02	2.55	56
		more than 70% > D.L.	no		yes	yes	yes	yes	no	yes	yes	yes	yes	yes	yes
		n	7		7	7	7	6	6	8	8	8	8	8	8
		info	(5)		(5)	(5)		(5)	(2), (5), (6)				(3)		(5)
		st.Dev.	NI		1.94	1.74	23.20	16.01	NI	1.71	2.35	0.68	2.96	0.75	16.86
256	Lissewege vaart	lower													
		upper													
		minimum	NI	NI	NI	NI	NI				NI		NI	NI	NI
		maximum	NI	NI	NI	NI	NI				NI		NI	NI	NI
		more than 70% > D.L.	NI	NI	NI	NI	NI				NI		NI	NI	NI
		n	NI	NI	NI	NI	NI				NI		NI	NI	NI
		info	(7)	(7)	(7)	(7)	(7)				(7)		(7)	(7)	(7)
		st.Dev.	NI	NI	NI	NI	NI				NI		NI	NI	NI
254	Schipdonk canal	lower													
		upper													
		minimum						ND	ND	1.26	2.58	0.45	6.2	0.78	
		maximum						86	ND	8.66	9.97	2.11	17.53	2.19	
		more than 70% > D.L.						yes	no	yes	yes	yes	yes	yes	
		n						6	6	8	8	8	8	8	
		info						(5)	(2), (5), (6)				(3)		

			Cd [µg/l]	Hg [µg/l]	Cu [µg/l]	Pb [µg/l]	Zn [µg/l]	g-HCH [ng/l]	PCB [ng/l]	NH4-N [mg/l]	NO3-N [mg/l]	PO4-P [mg/l]	Total N [mg/l]	Total P [mg/l]	SPM [mg/l]
		st.Dev.						30.41	NI	2.53	3.02	0.55	4.06	0.48	
242	Eastern Coastal Area	lower													
		upper													
		minimum	ND		ND	ND	22.15	ND	ND	ND	ND	0.100	0.470	0.170	ND
		maximum	0.306		7.062	5.636	102.20	86	ND	8.66	9.970	2.450	17.530	2.550	103
		more than 70% > D.L.	no		yes	yes	yes	yes	no	yes	yes	yes	yes	yes	yes
		n	17		17	17	17	24	24	26	26	25	26	25	18
		info	(5)		(5)	(5)		(5)	(2), (5), (6)	(5)	(5)		(1), (3)		(5)
		st.Dev.	0.06		1.73	1.51	21.29	19.09	NI	2.65	3.08	0.59	4.39	0.64	23.95
249	Gent-Oostende canal	lower													
		upper													
		minimum	ND		1.489	0.842	37.90	10	ND	4.56	1.23	0.8	8.89	1.31	6
		maximum	0.159		8.342	6.226	126.54	107	ND	12.88	9.81	1.73	15.17	2.04	20
		more than 70% > D.L.	no		yes	yes	yes	yes	no	yes	yes	yes	yes	yes	yes
		n	8		7	7	7	6	6	8	8	8	8	7	7
		info	(5)						(2), (5), (6)				(3)		
		st.Dev.	0.05		2.34	1.76	31.17	36.42	NI	2.97	2.72	0.35	2.11	0.27	5.38
250	Noordende	lower													
		st.Dev.													
241	Middle Coastal Area	lower													
		upper													
		minimum	ND		1.489	0.842	37.90	10	ND	4.56	1.23	0.8	8.89	1.31	6
		maximum	0.159		8.342	6.226	126.54	107	ND	12.88	9.81	1.73	15.17	2.04	20
		more than 70% > D.L.	no		yes	yes	yes	yes	no	yes	yes	yes	yes	yes	yes
		n	8		7	7	7	6	6	8	8	8	8	7	7
		info	(5)						(2), (5), (6)				(3)		
		st.Dev.	0.05		2.34	1.76	31.17	36.42	NI	2.97	2.72	0.35	2.11	0.27	5.38
238	Coastal Area	lower													
		upper													
		minimum	ND		ND	ND	ND	ND	ND	ND	ND	ND	0.47	0.10	ND
		maximum	0.41		8.81	9.48	126.54	107	ND	33.45	30.23	3.47	42.75	8.31	103
		more than 70% > D.L.	no		yes	yes	yes	yes	no	yes	yes	yes	yes	yes	yes
		n	51		53	53	53	30	30	63	63	59	63	60	54
		info	(9), (5)	(9)	(9), (5)	(9), (5)	(9), (5)	(9), (5)	(2), (9), (5)	(9), (5)	(9), (5)	(9), (5)	(1), (3), (9)	(9)	(9), (5)
		st.Dev.	0.08		2.01	1.65	26.09	23.75	NI	4.98	7.08	0.66	8.59	1.09	17.59
244	Gent-Terneuzen Canal	lower													
		upper													
		minimum	ND		ND	ND	ND	ND	ND	0.6	4	ND	7.44	0.7	1
		maximum	ND		26	20	300	26	ND	6.7	11.7	1.5	17.3	3.2	31
		more than 70% > D.L.	no		no	no	yes	yes	no	yes	yes	yes	yes	yes	yes
		n	24		24	24	24	6	6	24	24	22	24	22	22
		info	(5)		(5)	(5)	(5)	(5)	(2), (5), (6)			(5)	(1)		
		st.Dev.	NI		5.55	3.50	63.06	7.63	NI	1.53	1.74	0.28	2.83	0.72	7.94

			Cd [µg/l]	Hg [µg/l]	Cu [µg/l]	Pb [µg/l]	Zn [µg/l]	g-HCH [ng/l]	PCB [ng/l]	NH4-N [mg/l]	NO3-N [mg/l]	PO4-P [mg/l]	Total N [mg/l]	Total P [mg/l]	SPM [mg/l]
102	Schelde	lower													
		upper													
		minimum	ND	0.024	ND	ND	23	4	ND	ND	ND	ND	0.03	ND	18
		maximum	ND	0.165	23	46	260	25	ND	3.00	7.1	0.9	10.4	3.4	160
		more than 70% > D.L.	no	yes	no	no	yes	yes	no	no	yes	yes	yes	no	yes
		n	24	24	25	25	25	6	6	25	25	25	25	25	25
		info	(5)		(5)	(5)			(2), (5), (6)	(5)	(5)	(5)	(1)	(5)	
		st.Dev.	NI	0.03	5.08	8.85	48.04	7.37	NI	0.78	1.59	0.15	2.46	0.67	44.11
245	Schelde Basin	lower													
		upper													
		minimum	ND	0.024	ND	ND	ND	ND	ND	ND	ND	ND	0.03	ND	18
		maximum	ND	0.165	26	46	300	26	ND	6.7	11.7	1.5	17.3	3.4	160
		more than 70% > D.L.	no	yes	no	no	yes	yes	no	no	yes	yes	yes	no	yes
		n	48	24	49	49	49	12	12	49	49	47	49	47	47
		info	(5)		(5)	(5)	(5)	(5)	(2), (5), (6)	(5)	(5)	(5)	(1)	(5)	
		st.Dev.	NI	0.03	5.44	6.87	55.49	7.60	NI	1.87	1.89	0.42	3.91	0.79	41.32
79	North Sea (BE)	lower													
		upper													
		minimum	ND	0.024	ND	ND	ND	ND	ND	ND	ND	ND	0.03	ND	ND
		maximum	ND	0.165	26.000	46.000	300.00	107	ND	33.45	30.23	3.47	42.75	8.31	160
		more than 70% > D.L.	no	yes	no	no	yes	yes	no	yes	yes	yes	yes	yes	yes
		n	99	24	102	102	102	42	42	112	112	106	112	107	101
		info	(9), (5)	(9)	(9), (5)	(9), (5)	(9), (5)	(9), (5)	(2), (9), (5)	(9), (5)	(9), (5)	(9), (5)	(1), (3), (9)	(9), (5)	(9), (5)
		st.Dev.	0.213	0.033	4.610	5.568	47.770	20.74	NI	3.98	7.08	0.58	6.96	0.97	31.9

Table 8. Detection Limits
Reported Maritime Area of the OSPAR Convention in 1997 by Belgium

		Cd [µg/l]	Hg [µg/l]	Cu [µg/l]	Pb [µg/l]	Zn [µg/l]	g-HCH [ng/l]	PCB [ng/l]	NH4-N [mg/l]	NO3-N [mg/l]	PO4-P [mg/l]	Total N [mg/l]	Total P [mg/l]	SPM [mg/l]
247 Beverdijk	Sewage													
	Industrial													
	Riverine	0.115-0.138		1,22	NI	NI			0,1	0,2	0,1	NI	NI	NI
243 Ijzer	Sewage													
	Industrial													
	Riverine	0.109-0.119		NI	0.588-0.623	NI			0,1	NI	NI	NI	NI	NI
246 Langeleed	Sewage													
	Industrial													
	Riverine	0.115-0.137		NI	NI	NI			NI	0,2	NI	NI	NI	6
239 Western Coastal Area	Sewage													
	Industrial													
	Riverine	0.109-0.138		NI	NI	NI			NI	NI	NI	NI	NI	NI
255 Blankenbergse vaart	Sewage													
	Industrial													
	Riverine	0.116-0.136		NI	0,475	NI	NI	2-5	0,1	0,2	NI	NI	NI	NI
251 Boudewijn canal	Sewage													
	Industrial													
	Riverine	NI	NI	NI	NI	NI	NI	2-5		NI		NI	NI	NI
252 Leopold canal	Sewage													
	Industrial													
	Riverine	0.116-0.136		1,017	0,470	NI	5	2-5	NI	NI	NI	NI	NI	6
256 Lissewege vaart	Sewage													
	Industrial													
	Riverine	NI	NI	NI	NI	NI				NI		NI	NI	NI
254 Schipdonk canal	Sewage													
	Industrial													
	Riverine						5	2-5	NI	NI	NI	NI	NI	
242 Eastern Coastal Area	Sewage													
	Industrial													
	Riverine	0.116-0.136		NI	0.470-0.475	NI	NI	2-5	NI	NI	NI	NI	NI	NI

249	Gent-Oostende canal	Sewage													
		Industrial													
		Riverine	0.111-0.116		NI	NI	NI	NI	5-8	NI	NI	NI	NI	NI	NI
241	Middle Coastal Area	Sewage													
		Industrial													
		Riverine	0.111-0.116		NI	NI	NI	NI	5-8	NI	NI	NI	NI	NI	NI
238	Coastal Area	Sewage													
		Industrial													
		Riverine	0.109-0.138		NI	NI	NI	NI	2 - 8	NI	NI	NI	NI	NI	NI
244	Gent-Terneuz	Sewage													
		Industrial													
		Riverine	1		10	10	20	5	4 - 5	NI	NI	0,5	NI	1	NI
102	Schelde	Sewage													
		Industrial													
		Riverine	1	0,003	10	10	NI	NI	4 - 5	0,5	0,1	0,5	NI	0.5 -1	NI
245	Schelde Basin	Sewage													
		Industrial													
		Riverine	1	NI	10	10	NI	NI	4 - 5	NI	NI	0,5	NI	0.5 - 1	NI
79	North Sea (BE)	Sewage													
		Industrial													
		Riverine	0.109 - 1	NI	NI	NI	NI	NI	2 - 8	NI	NI	NI	NI	NI	NI

Table 9. Catchment-dependent information
Reported Maritime Area of the OSPAR Convention in 1997 by Belgium

		Flow Rate [1000m³/d]	LTA [1000m³/d]	Minimum FR [1000m³/d]	Maximum FR [1000m³/d]	LTA info (years)	Number of sites	Mean or Median
247	Beverdijk	NI	69.1	NI	NI	NI	1	Mean
243	Ijzer	NI	561.6	NI	NI	1987-1992	1	Mean
246	Langeleed	NI	25.9	NI	NI	NI	1	Mean
248	Vladslovaart	NI	51.8	NI	NI	NI	1	Mean
239	Western Coastal Area	NI	708.4	NI	NI	NI	4	Mean
255	Blankenbergse vaart	NI	34.6	NI	NI	NI	1	Mean
251	Boudewijn canal	60	NI	NI	NI	NI		Mean
252	Leopold canal	NI	302.4	NI	NI	NI	1	Mean
256	Lissewege vaart	NI	17.3	NI	NI	NI	1	Mean
254	Schipdonk canal	NI	820.8	NI	NI	1987-1992	1	Mean
242	Eastern Coastal Area	NI	1175.1	NI	NI	NI	4	Mean
249	Gent-Oostende canal	NI	432	NI	NI	NI	1	Mean
250	Noordende	NI	69.1	NI	NI	NI		Mean
241	Middle Coastal Area	NI	501.1	NI	NI	NI	1	Mean
238	Coastal Area	NI	2384.6	NI	NI	NI	9	Mean
244	Gent-Terneuzen Canal	1240	NI	285.12	2928.96	NI	1	Mean
102	Schelde	7258	9245	2678	19699	1949-1997	1	Mean
245	Schelde Basin	8498	NI	2963	22628	NI	2	Mean
79	North Sea (BE)	NI	NI	NI	NI	NI	11	Mean

Annex 2

DENMARK

Table 5a. Sewage Effluents
Reported Maritime Area of the OSPAR Convention in 1997 by Denmark

			Cd [t]	Hg [t]	Cu [t]	Pb [t]	Zn [t]	g-HCH [kg]	PCB [kg]	NH4-N [kt]	NO3-N [kt]	PO4-P [kt]	Total N [kt]	Total P [kt]	SPM [kt]
110	Brøns å												0.001	0.0003	
116	Hover å												0.002	0.0001	
112	Kongeaen												0.03	0.005	
111	Ribe å												0.04	0.001	
104	Skjern å												0.05	0.004	
113	Sneum å												0.05	0.006	
115	Stor å												0.1	0.009	
114	Varde å												0.05	0.009	
109	Vid å												0.008	0.0009	
80	**North Sea (DK)**												**0.7**	**0.07**	
125	Elling å														
127	Ger å												0.002	0.0005	
103	Guden a												0.3	0.002	
129	Haslevgard å												0.005	0.001	
119	Hvidbjerg å												0.002	0.0005	
120	Jordbr å												0.004	0.0003	
118	Karup å												0.02	0.002	
130	Kastbjerg å												0.0000	0.0000	
128	Lindeborg å												0.001	0.0002	
122	Simmersted å												0.007	0.0006	
121	Skals å												0.01	0.0009	
126	Voer å												0.01	0.003	
77	**Kattegat (DK)**												**1.3**	**0.1**	
123	Liver å												0.02	0.002	
124	Uggerby å												0.01	0.001	
74	**Skagerrak (DK)**												**0.08**	**0.009**	

Table 6a. Main Riverine Inputs
Reported Maritime Area of the OSPAR Convention in 1997 by Denmark

			Cd [t]	Hg [t]	Cu [t]	Pb [t]	Zn [t]	g-HCH [kg]	PCB [kg]	NH4-N [kt]	NO3-N [kt]	PO4-P [kt]	Total N [kt]	Total P [kt]	SPM [kt]
110	Brøns å									0.005	0.1	0.0004	0.1	0.002	
117	Flynder å														
116	Hover å											0.0006	0.1	0.003	
112	Kongeaen										0.6	0.006	0.8	0.02	
111	Ribe å											0.007	1.2	0.03	
104	Skjern å										1.2	0.008	1.5	0.03	
113	Sneum å											0.005	0.7	0.02	
115	Stor å										1.1	0.007	1.2	0.03	
114	Varde å											0.005	1.3	0.04	
109	Vid å									0.006	0.2	0.0009	0.2	0.006	
80	**North Sea (DK)**										**10**	**0.09**	**12**	**0.3**	
125	Elling å									0.006	0.1	0.003	0.1	0.004	
127	Ger å									0.006	0.1	0.002	0.2	0.005	
103	Guden a									0.08	1.6	0.03	2.2	0.09	
129	Haslevgard å									0.005	0.1	0.003	0.1	0.005	
119	Hvidbjerg å									0.005	0.2	0.0007	0.3	0.01	
120	Jordbr å										0.05	0.001	0.07	0.003	
118	Karup å										0.5	0.003	0.6	0.02	
130	Kastbjerg å									0.002	0.1	0.001	0.2	0.002	
128	Lindeborg å									0.006	0.5	0.007	0.5	0.009	
122	Simmersted å										0.591	0.008	0.06	0.01	
121	Skals å										0.4	0.004	0.5	0.01	
126	Voer å									0.01	0.3	0.005	0.3	0.01	
77	**Kattegat (DK)**										**17**	**0.3**	**20**	**0.6**	
123	Liver å									0.01	0.3	0.005	0.4	0.01	
124	Uggerby å									0.02	0.4	0.007	0.5	0.02	
74	**Skagerrak (DK)**										**1.3**	**0.03**	**1.6**	**0.07**	

Table 7. Contaminant Concentration
Reported Maritime Area of the OSPAR Convention in 1997 by Denmark

			Cd [µg/l]	Hg [µg/l]	Cu [µg/l]	Pb [µg/l]	Zn [µg/l]	g-HCH [ng/l]	PCB [ng/l]	NH4-N [mg/l]	NO3-N [mg/l]	PO4-P [mg/l]	Total N [mg/l]	Total P [mg/l]	SPM [mg/l]
110	Brøns å	lower								0.209	4.24	0.017	5.17	0.075	
		upper													
		minimum								0.061	2.6	0.01	3	0.042	
		maximum								0.74	7.1	0.039	8.2	0.26	
		more than 70% > D.L.													
		n								20	20	20	20	20	
		info													
		st.Dev.								0.138	1.077	0.006	1.208	0.052	
116	Hover å	lower										0.02	3.338	0.088	
		upper													
		minimum										0.01	2.1	0.04	
		maximum										0.034	4.6	0.25	
		more than 70% > D.L.													
		n										15	16	16	
		info													
		st.Dev.										0.007	0.741	0.052	
112	Kongeaen	lower									4.258	0.046	5.026	0.168	
		upper													
		minimum									2.61	0.025	3.26	0.086	
		maximum									6.65	0.098	7.37	0.25	
		more than 70% > D.L.													
		n									20	20	20	20	
		info													
		st.Dev.									1.101	0.02	1.176	0.05	

Table 7. Contaminant Concentration
Reported Maritime Area of the OSPAR Convention in 1997 by Denmark

			Cd [µg/l]	Hg [µg/l]	Cu [µg/l]	Pb [µg/l]	Zn [µg/l]	g-HCH [ng/l]	PCB [ng/l]	NH4-N [mg/l]	NO3-N [mg/l]	PO4-P [mg/l]	Total N [mg/l]	Total P [mg/l]	SPM [mg/l]
111	Ribe å	lower										0.023	4.184	0.086	
		upper													
		minimum										0.009	2.68	0.05	
		maximum										0.037	7.29	0.13	
		more than 70% > D.L.													
		n										19	19	19	
		info													
		st.Dev.										0.008	1.176	0.023	
104	Skjern å	lower								0.13	2.511	0.015	3.018	0.069	
		upper													
		minimum								0.035	0.89	0.005	2.1	0.015	
		maximum								0.45	3.9	0.034	4.6	0.19	
		more than 70% > D.L.													
		n								17	17	17	17	17	
		info													
		st.Dev.								0.101	0.681	0.007	0.645	0.044	
113	Sneum å	lower										0.031	4.783	0.11	
		upper													
		minimum										0.019	3.14	0.063	
		maximum										0.048	6.73	0.19	
		more than 70% > D.L.													
		n										20	20	20	
		info													
		st.Dev.										0.009	0.984	0.037	
115	Stor å	lower									2.937	0.02	3.39	0.072	
		upper													
		minimum									1.7	0.008	2.1	0.049	
		maximum									5.1	0.04	6.2	0.15	
		more than 70% > D.L.													
		n									19	19	19	19	
		info													
		st.Dev.									0.854	0.008	1.031	0.021	

Table 7. Contaminant Concentration
Reported Maritime Area of the OSPAR Convention in 1997 by Denmark

			Cd [µg/l]	Hg [µg/l]	Cu [µg/l]	Pb [µg/l]	Zn [µg/l]	g-HCH [ng/l]	PCB [ng/l]	NH4-N [mg/l]	NO3-N [mg/l]	PO4-P [mg/l]	Total N [mg/l]	Total P [mg/l]	SPM [mg/l]
114	Varde å	lower										0.015	3.999	0.107	
		upper													
		minimum										0.008	2.99	0.058	
		maximum										0.026	4.94	0.413	
		more than 70% > D.L.													
		n										20	20	20	
		info													
		st.Dev.										0.005	0.581	0.081	
109	Vid å	lower								0.095	2.251	0.016	2.95	0.094	
		upper													
		minimum								0.016	0.89	0.006	1.1	0.048	
		maximum								0.19	3.8	0.034	4.7	0.21	
		more than 70% > D.L.													
		n								20	20	20	20	20	
		info													
		st.Dev.								0.057	0.712	0.008	0.899	0.043	
80	North Sea (DK)	lower									**3.3**	**0.027**	**4.0**	**0.097**	
		upper													
		minimum													
		maximum													
		more than 70% > D.L.													
		n													
		info									**flowweig**	**flowwe**	**flowwe**	**flowweigt.**	
		st.Dev.													
125	Elling å	lower								0.148	2.832	0.081	3.452	0.125	
		upper													
		minimum								0.018	2.16	0.057	2.51	0.085	
		maximum								0.3	4.17	0.13	5.45	0.17	
		more than 70% > D.L.													
		n								25	25	25	25	25	
		info													
		st.Dev.								0.099	0.534	0.02	0.755	0.026	

Table 7. Contaminant Concentration
Reported Maritime Area of the OSPAR Convention in 1997 by Denmark

			Cd [µg/l]	Hg [µg/l]	Cu [µg/l]	Pb [µg/l]	Zn [µg/l]	g-HCH [ng/l]	PCB [ng/l]	NH4-N [mg/l]	NO3-N [mg/l]	PO4-P [mg/l]	Total N [mg/l]	Total P [mg/l]	SPM [mg/l]
127	Ger å	lower								0.167	2.852	0.048	3.74	0.137	
		upper													
		minimum								0.034	1.32	0.031	2.02	0.055	
		maximum								0.33	6.63	0.087	8.8	0.22	
		more than 70% > D.L.													
		n								25	25	25	25	25	
		info													
		st.Dev.								0.088	1.423	0.014	1.7	0.035	
103	Guden a	lower								0.088	1.724	0.039	2.524	0.115	
		upper													
		minimum								0.013	0.73	0.003	1.49	0.064	
		maximum								0.237	3.67	0.118	4.82	0.377	
		more than 70% > D.L.													
		n								23	23	23	23	23	
		info													
		st.Dev.								0.058	0.824	0.028	0.948	0.067	
129	Haslevgard å	lower								0.118	6.748	0.068	6.85	0.328	
		upper													
		minimum								0.048	4	0.019	3.53	0.19	
		maximum								0.251	8.86	0.17	15.53	0.59	
		more than 70% > D.L.													
		n								17	17	17	18	18	
		info													
		st.Dev.								0.055	1.08	0.038	2.934	0.1	
119	Hvidbjerg å	lower								0.069	1.551	0.016	3.974	0.29	
		upper													
		minimum								0.003	0.23	0.002	1.9	0.058	
		maximum								0.22	6.3	0.081	7.9	0.77	
		more than 70% > D.L.													
		n								19	19	19	19	19	
		info													
		st.Dev.								0.067	1.868	1.019	1.754	0.196	

Table 7. Contaminant Concentration
Reported Maritime Area of the OSPAR Convention in 1997 by Denmark

			Cd [µg/l]	Hg [µg/l]	Cu [µg/l]	Pb [µg/l]	Zn [µg/l]	g-HCH [ng/l]	PCB [ng/l]	NH4-N [mg/l]	NO3-N [mg/l]	PO4-P [mg/l]	Total N [mg/l]	Total P [mg/l]	SPM [mg/l]
120	Jordbr å	lower									1.806	0.035	2.378	0.102	
		upper													
		minimum									1.4	0.018	1.5	0.018	
		maximum									2.9	0.061	4.5	0.18	
		more than 70% > D.L.													
		n									18	18	18	18	
		info													
		st.Dev.									0.372	0.009	0.704	0.038	
118	Karup å	lower									2.55	0.016	3.128	0.11	
		upper													
		minimum									1.9	0.006	2.2	0.067	
		maximum									3.2	0.025	4.3	0.19	
		more than 70% > D.L.													
		n									18	18	18	18	
		info													
		st.Dev.									0.329	0.005	0.588	0.033	
130	Kastbjerg å	lower								0.118	6.748	0.068	7.892	0.141	
		upper													
		minimum								0.048	4	0.019	5.72	0.066	
		maximum								0.251	8.86	0.17	11	0.761	
		more than 70% > D.L.													
		n								17	17	17	17	17	
		info													
		st.Dev.								0.055	1.081	0.038	1.212	0.165	
128	Lindeborg å	lower								0.066	5.429	0.078	5.943	0.105	
		upper													
		minimum								0.005	4.62	0.033	4.93	0.06	
		maximum								0.18	6.48	0.13	7.33	0.17	
		more than 70% > D.L.													
		n								12	12	12	12	12	
		info													
		st.Dev.								0.057	0.655	0.032	0.895	0.037	

Table 7. Contaminant Concentration
Reported Maritime Area of the OSPAR Convention in 1997 by Denmark

			Cd [µg/l]	Hg [µg/l]	Cu [µg/l]	Pb [µg/l]	Zn [µg/l]	g-HCH [ng/l]	PCB [ng/l]	NH4-N [mg/l]	NO3-N [mg/l]	PO4-P [mg/l]	Total N [mg/l]	Total P [mg/l]	SPM [mg/l]
122	Simmersted å	lower									9.8	0.129	10.36	0.172	
		upper													
		minimum									8.6	0.06	9.3	0.083	
		maximum									11	0.29	12	0.39	
		more than 70% > D.L.													
		n									18	18	18	18	
		info													
		st.Dev.									0.733	0.046	0.77	0.062	
121	Skals å	lower									3.644	0.039	4.6	0.12	
		upper													
		minimum									2.8	0.009	3.5	0.075	
		maximum									5.1	0.092	6.6	0.17	
		more than 70% > D.L.													
		n									18	18	18	18	
		info													
		st.Dev.									0.649	0.023	0.865	0.025	
126	Voer å	lower								0.188	4.389	0.095	5.37	0.217	
		upper													
		minimum								0.021	3.07	0.06	3.45	0.11	
		maximum								1.01	7.09	0.19	8.39	0.39	
		more than 70% > D.L.													
		n								17	17	17	17	17	
		info													
		st.Dev.								0.225	1.324	0.035	1.651	0.082	
77	Kattegat (DK)	lower									**4.7**	**0.089**	**5.5**	**0.170**	
		upper													
		minimum													
		maximum													
		more than 70% > D.L.													
		n													
		info									**flowweig**	**flowwe**	**flowwe**	**flowweigt.**	
		st.Dev.													

Table 7. Contaminant Concentration
Reported Maritime Area of the OSPAR Convention in 1997 by Denmark

			Cd [µg/l]	Hg [µg/l]	Cu [µg/l]	Pb [µg/l]	Zn [µg/l]	g-HCH [ng/l]	PCB [ng/l]	NH4-N [mg/l]	NO3-N [mg/l]	PO4-P [mg/l]	Total N [mg/l]	Total P [mg/l]	SPM [mg/l]
123	Liver å	lower								0.25	4.583	0.095	5.662	0.212	
		upper													
		minimum								0.038	3.08	0.031	3.99	0.13	
		maximum								0.96	6.46	0.23	9.6	0.39	
		more than 70% > D.L.													
		n								19	19	19	19	19	
		info													
		st.Dev.								0.219	1.017	0.057	1.52	0.069	
124	Uggerby å	lower								0.195	3.659	0.085	4.593	0.186	
		upper													
		minimum								0.024	2.43	0.059	2.94	0.12	
		maximum								0.49	6.11	0.13	7.53	0.36	
		more than 70% > D.L.													
		n								18	18	18	18	18	
		info													
		st.Dev.								0.135	0.996	0.021	1.274	0.067	
74	Skagerrak (DK)	lower									**5.3**	**0.139**	**6.6**	**0.276**	
		upper													
		minimum													
		maximum													
		more than 70% > D.L.													
		n													
		info									**flowweig**	**flowwe**	**flowwe**	**flowweigt.**	
		st.Dev.													

Table 8. Detection Limits
Reported Maritime Area of the OSPAR Convention in 1997 by Denmark

			1 Cd [µg/l]	5 Hg [µg/l]	6 Cu [µg/l]	2 Pb [µg/l]	7 Zn [µg/l]	8 g-HCH [ng/l]	9 PCB [ng/l]	10 NH4-N [mg/l]	11 NO3-N [mg/l]	12 PO4-P [mg/l]	13 Total N [mg/l]	14 Total P [mg/l]	3 SPM [mg/l]
110	Brøns å	Riverine								>0.01	>0.02	>0.05	>0.06	>0.01	
117	Flynder å	Riverine													
116	Hover å	Riverine								>0.01	>0.02	>0.05	>0.06	>0.01	
112	Kongeaen	Riverine								>0.01	>0.02	>0.05	>0.06	>0.01	
111	Ribe å	Riverine								>0.01	>0.02	>0.05	>0.06	>0.01	
104	Skjern å	Riverine								>0.01	>0.02	>0.05	>0.06	>0.01	
113	Sneum å	Riverine								>0.01	>0.02	>0.05	>0.06	>0.01	
115	Stor å	Riverine								>0.01	>0.02	>0.05	>0.06	>0.01	
114	Varde å	Riverine								>0.01	>0.02	>0.05	>0.06	>0.01	
109	Vid å	Riverine								>0.01	>0.02	>0.05	>0.06	>0.01	
80	North Sea (DK)	Riverine								>0.01	>0.02	>0.05	>0.06	>0.01	
125	Elling å	Riverine								>0.01	>0.02	>0.05	>0.06	>0.01	
127	Ger å	Riverine								>0.01	>0.02	>0.05	>0.06	>0.01	
103	Guden a	Riverine								>0.01	>0.02	>0.05	>0.06	>0.01	
129	Haslevgard å	Riverine								>0.01	>0.02	>0.05	>0.06	>0.01	
119	Hvidbjerg å	Riverine								>0.01	>0.02	>0.05	>0.06	>0.01	
120	Jordbr å	Riverine								>0.01	>0.02	>0.05	>0.06	>0.01	
118	Karup å	Riverine								>0.01	>0.02	>0.05	>0.06	>0.01	
130	Kastbjerg å	Riverine								>0.01	>0.02	>0.05	>0.06	>0.01	
128	Lindeborg å	Riverine								>0.01	>0.02	>0.05	>0.06	>0.01	
122	Simmersted å	Riverine								>0.01	>0.02	>0.05	>0.06	>0.01	
121	Skals å	Riverine								>0.01	>0.02	>0.05	>0.06	>0.01	
126	Voer å	Riverine								>0.01	>0.02	>0.05	>0.06	>0.01	
77	Kattegat (DK)	Riverine								>0.01	>0.02	>0.05	>0.06	>0.01	
123	Liver å	Riverine								>0.01	>0.02	>0.05	>0.06	>0.01	
124	Uggerby å	Riverine								>0.01	>0.02	>0.05	>0.06	>0.01	
74	Skagerrak (DK)	Riverine								>0.01	>0.02	>0.05	>0.06	>0.01	

Table 9. Catchment-dependent information
Reported Maritime Area of the OSPAR Convention in 1997 by Denmark

		Flow Rate [1000m³/d]	LTA [1000m³/d]	Minimum FR [1000m³/d]	Maximum FR [1000m³/d]	LTA info (years)	Number of sites	Mean or Median
110	Brøns å	63.5	105.28	52.44	163.11	74-97	1	Mean
117	Flynder å							
116	Hover å	88.8	117.96	80.71	148.61	81-97	1	Mean
112	Kongeaen	579.98	636.4	364.91	861.82	90-97	1	Mean
111	Ribe å	753.6	1392.95	1164.88	1681.33	87-95	1	Mean
104	Skjern å	1391.6	2079.7	1345.63	2717.49	74-97	1	Mean
113	Sneum å	410.2	652.44	510.14	873.01	89-95	1	Mean
115	Stor å	964.6	1379.73	856.4	1756.61	71-97	1	Mean
114	Varde å	909.8	1331.44	1072.63	1723.61	89-95	1	Mean
109	Vid å	171.4	299.66	144.77	444.03	78-97	1	Mean
80	North Sea (DK)	**8493.2**	**13643.8**			**1971-90**		**Mean**
125	Elling å	87.7	103.36	87.73	151.46	89-97	1	Mean
127	Ger å	94.4	134.21	79.94	211.55	85.97	1	Mean
103	Guden a	2143.9	2801.86	1997.72	3665.27	78-97	1	Mean
129	Haslevgard å	39.1	51.43	37.89	97.45	89-97	1	Mean
119	Hvidbjerg å	153	244.94	119.24	319.43	83-97	1	Mean
120	Jordbr å	80.8	112.4	80.8	141.27	80-97	1	Mean
118	Karup å	489.8	616.48	472.09	749.28	86-97	1	Mean
130	Kastbjerg å	58	66.84	48.06	84.3	76-97	1	Mean
128	Lindeborg å	227.4	279.15	227.43	392.24	89-97	1	Mean
122	Simmersted å	168.2	198.15	168.22	246.76	92-97	1	Mean
121	Skals å	312.3	378.2	234.24	539.64	73-97	1	Mean
126	Voer å	163.6	205.79	163.62	319.55	89-97	1	Mean
77	Kattegat (DK)	**9890.4**	**13479.5**			**1971-90**		**Mean**
123	Liver å	146.4	164.89	128.96	219.33	95-96	1	Mean
124	Uggerby å	232.6	292.55	232.62	433.04	89-97	1	Mean
74	Skagerrak (DK)	**671.2**	**863.0**			**1971-90**		**Mean**

Annex 3

FRANCE

No data were received for 1997.

Annex 4

GERMANY

Annual report on riverine inputs and direct discharges to Convention waters during the year 1997 by Germany

Annual report on riverine inputs and direct discharges by Germany to Convention waters during the year 1997

Name, address and contact numbers of reporting authority to which any further enquiry should be addressed:
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A. General information

Table 1: General overview of river systems (for riverine inputs) and direct discharge areas (for direct discharges) included in the data report

Country: Federal Republic of Germany

Name of river, subarea and discharge area[1]	Nature of the receiving water[2]	optional: national reference number	optional: map reference number
Elbe St. Pauli (estuary)	tidal range 3.25 m		
Weser Farge (estuary)	tidal range 3.7 m		
Ems Herbrum (at tidal weir)	no tidal influence		
Eider estuary (at tidal weir)	no tidal influence		

[1] i.e. name of estuary or length of coastline
[2] i.e. estuary or coastal water; if an estuary, state the tidal range and the daily flushing volume

B. Total riverine inputs and direct discharges for the year 1997

B.1 Comments on the Total Riverine Inputs and Direct Discharges as presented in Table 4a:

[none]

C. Direct discharges for the year 1997

Sewage Effluents (Table 5a.)

C.1 Describe the methods of measurement and calculation used, including information on the number of samples and the concentration upon which the measurement is based (ref.: Section 6 of the Principles), including for those under voluntary reporting:

*For the **Elbe,** all discharges of sewage effluents were determined downstream of the "Seemannshöft" measurement site. Dischargers have to carry out a mandatory monitoring of their discharges. The results of such monitoring were used to determine the inputs of the major dischargers. Measurements are based on 4 to 8 2-hour mixed samples. All other data are estimates.*

The loads of Weser and Ems downstream of the measurement sites for riverine inputs and those of the Jade are estimates based on population equivalents.

C.2 Describe the determinands, other than those specified in paragraph 2.1 of the Principles, that are included in the current monitoring programme and which may be relevant for the Comprehensive Study on Riverine Inputs and Direct Discharges (voluntary reporting):

[none]

Industrial Effluents (Table 5b.)

C.3 Describe the methods of measurement and calculation used, including information on the number of samples and the concentration upon which the measurement is based (ref.: Section 6 of the Principles), including for those under voluntary reporting:

*For the **Elbe,** all discharges of industrial effluents were determined downstream from the "Seemannshöft" measurement site. Dischargers have to carry out a mandatory monitoring of their discharges. The results of such monitoring were used to determine the inputs of the major dischargers. Measurements are based on 2-hour mixed samples. All other data are estimates.*

The loads of Weser and Ems downstream of the measurement sites for riverine inputs and those of the Jade are estimates.

C.4 Give any other relevant information (e.g. proportion of substance discharged as insoluble material):

[none]

C.5 Give any available information on other discharges directly to Convention Waters - through e.g. urban run-off and stormwater overflows - that are not covered by the data in tables 5a. and 5b.:

[none]

C.6 Describe the determinands, other than those specified in paragraph 2.1 of the Principles, that are included in the current monitoring programme and which may be relevant for the Comprehensive Study on Riverine Inputs and Direct Discharges (voluntary reporting):

[none]

D. Riverine inputs for the year 1997

Main Rivers (Tables 6a. and 7a.)

D.1 Describe the methods of measurement and calculation used, including information on the number of samples and the concentration (Table 7a.) upon which the measurement is based (ref.: Section 5 of the Principles), including for those under voluntary reporting:

*The load data for the **Elbe** at the Seemannshöft measurement site comprise approx. 95% of the total input. The loads of the major tributaries (left side: Este, Lühe, Schwinge, Oste; right side: Pinnau, Krückau, Stör) have to be added.*
*The Farge measurement site covers 90% of the **Weser** catchment area, the Herbrum measurements site covers 70% of the **Ems** catchment area. The remainder is covered by the estimates of direct inputs given in table 5a-c.*
*The measurement sites "Eider" and "Treene" cover approx. 82% of the total catchment area of the **Eider**, with the loads measured being extrapolated to cover 100% of the catchment area.*

Sampling frequencies *are as follows for the respective rivers:*

Elbe: *For the main river (cross-section measurements taken fortnightly): 24 measurements per year for all parameters to be monitored except PCBs (12 measurements per year). In 1997 two samples could not be taken because of ice cover.*

Weser: *12 measurements per year (cross-section measurements taken once a month) for all parameters to be monitored.*

Ems: *12 measurements per year (cross-section measurements taken once a month) for all parameters to be monitored.*

Eider: *Measurements include samples in the main river on the basis of representative random samples: 13 measurements per year for all parameters to be monitored.*

Sampling site

*In the **Elbe**, sampling to obtain riverine input data is carried out upstream of the freshwater limit (Seemannshöft measurement site) in the tidal river. In 1994 the monitoring station was shifted upstream from Grauerort (km 660,5) to Seemannshöft (km 628,8) to get out of the high turbidity zone. In the **Weser** sampling is carried out upstream of the freshwater limit in the tidal river (Farge measurement site) and in the **Ems** it is carried out at the tidal limit (Herbrum measurement site). Sampling in the **Eider** is carried out at the tidal limit in the main river (measurement sites: Eider, Nordfeld, size of catchment area: 905 km^2) as well as in the tributary Treene (measurement sites: Treene, Friedrichstadt, size of catchment area: 797 km^2).*

Estimation of annual load

Annual loads L are calculated as follows for the various river systems:

Elbe:

$$L = \frac{Q_r \cdot \sum_{i=1}^{n} (c_i \cdot Q_i)}{\sum_{i=1}^{n} (Q_i)}$$

Where:
- ci is the concentration measured in sample i;
- Qi is the corresponding mean daily flow for sample i;
- Qr is the mean daily flow rate for each sampling period (year); and
- n is the number of samples taken in the sampling period (year).

Weser, Ems, Eider:

$$L = \frac{\sum_{i=1}^{n} (c_i \cdot Q_i)}{n}$$

Measurements in tidal areas

For the Elbe, flow is determined for a cross-section at the freshwater limit, which lies within the tide-influenced zone, using a one-dimensional mathematical flow model. In keeping with the "Principles of the Comprehensive Study on Riverine Inputs" a mass balance was drawn up in 1986/1987 (cf. INPUT 3/INFO 3: Drawing up a Balance for Inputs of Substances to the Elbe Estuary). Originally, the sampling site was directly located at the freshwater limit. Based on the balance, however, the sampling site was moved 15 km upstream to Grauerort in

1988 in order to get out of the turbidity zone. In 1991, 1992 and 1993 the influence of the turbidity zone made itself strongly felt also at this measurement site, resulting in part in an overestimation of loads. As a consequence, the measurement site was again moved further upstream to Seemannshöft in 1994.

Flow in the Weser was determined at the PARCOM measurement site Farge. When the tide is outgoing (ebb stream) the RID measurement site Farge must be regarded as being located distinctly upstream from the freshwater limit. There is virtually no influence of North Sea water at the Farge measurement site during the ebb tide, the tidal phase during which the RID measurements are carried out.

The loads of Ems and Eider were measured at the tidal weir.

D.2 Give any other relevant information (e.g. proportion of substance transported by the river in particulate form):

[none]

D.3 Describe the determinands, other than those specified in paragraph 2.1 of the Principles, that are included in the current monitoring programme and which may be relevant for the Comprehensive Study on Riverine Inputs and Direct Discharges (voluntary reporting):

[none]

Tributary Rivers (Tables 6b. and 7b.)

D.4 Describe the methods of measurement and calculation used, including information on the number of samples and the concentration (Table 7b.) upon which the measurement is based (ref.: Section 5 of the Principles):

Elbe: *For the tributaries 12 to 23 measurements per year were carried out on the basis of representative random samples. Only for PCBs in the right-side tributaries the sampling frequency was 3 times per year.*

Weser: *No measurements were carried out for the tributaries.*

Ems: *No measurements were carried out for the tributaries.*

Eider: *For the tributary Treene at Friedrichstadt 13 measurements per year were carried out on the basis of representative random samples.*

D.5 Give any other relevant information (e.g. proportion of substance transported by the river in particulate form):

[none]

D.6 Describe the determinands, other than those specified in paragraph 2.1 of the Principles, that are included in the current monitoring programme and which may be relevant for the Comprehensive Study on Riverine Inputs and Direct Discharges (voluntary reporting):

[none]

D.7 Give any available information on other inputs - through e.g. polder effluents or from coastal areas - that are not covered by data in tables 6a. and 6b.:

[none]

E. Limits of detection

E.1 Information concerning limits of detection should be presented in Table 8 which includes different columns for rivers/tributaries, sewage effluents and industrial effluents. Any important comments may be presented here:

See Table 8.

F. National Comments

F.1 Give a general summary of the main results as presented in tables 5,6 and 7 and comment, as appropriate, of these results.

Compared to the long-term average flows, 1997 was a dry year in all the German North Sea rivers. However, flow of Ems and Weser in 1997 was higher than in 1996.

F.2 Indicate any significant change in inputs and concentrations in comparison to previous years. Comment on these changes as appropriate.

Apart from the Weser inputs (higher flow than in 1996) there are no significant changes in the inputs during the year 1997.

F.3 Indicate and explain, if appropriate:

- where and why the applied procedures do not comply with agreed procedures
- significant changes in monitoring sites, important for comparison of the data before and after the date of the change
- incomplete or distorted data

In the river Elbe 2 of 26 samples could not be taken because of ice cover in January 1997.....

Table 5a. Direct discharges to the maritime area in 1997 by Germany

Sewage effluents				Quantities --->												
Discharge area	Nature of receiving water		Flow rate [1000 m³/d]	Cd [t]	Hg [t]	Cu [t]	Pb [t]	Zn [t]	g-HCH [kg]	PCBs (1) [kg]	NH4-N [kt]	NO3-N [kt]	PO4-P [kt]	Total N [kt]	Total P [kt]	SPM(2) [kt]
Ems Estuary	Estuary	(lower estimate)	75	0	0	0.5	0.3	2.7	0	0.01	0.4	0.3	0.02	0.7	0.1	0.4
(downstream of Herbrum)		(upper estimate)		0.01	0.01	0.5	0.3	2.7	0.01	0.01	0.4	0.3	0.02	0.7	0.1	0.4
Jade	Estuary	(lower estimate)	25	0.01	0.01	0.2	0.1	1.0	0.01	0.01	NI	0.1	0.005	0.2	0.04	NI
		(upper estimate)		0.01	0.01	0.2	0.1	1.0	0.01	0.01	NI	0.1	0.005	0.2	0.04	NI
Weser Estuary	Estuary	(lower estimate)	229	0	0	1.5	0.7	7.8	0.01	0.03	1.6	0.9	0.04	2.1	0.3	1.1
(downstream of Farge)		(upper estimate)		0.01	0.01	1.5	0.7	7.8	0.3	1.8	1.6	0.9	0.04	2.1	0.3	1.1
Elbe Estuary	Estuary	(lower estimate)	75	0	0	0	0	0	NI	NI	NI	0.2	0.02	0.4	0.02	0.4
		(upper estimate)		0.01	0.01	0.5	0.1	5	NI	NI	NI	0.2	0.02	0.4	0.02	0.4
		Total:	**404**	**0.01**	**0.01**	**2.2**	**1.1**	**12**	**0.02**	**0.05**	**2.0**	**1.5**	**0.1**	**3.5**	**0.5**	**1.9**
				0.04	**0.04**	**2.7**	**1.2**	**17**	**0.3**	**1.9**	**2.0**	**1.5**	**0.1**	**3.5**	**0.5**	**1.9**

Table 5b. Direct discharges to the maritime area in 1997 by Germany

Industrial effluents				Quantities --->												
Discharge area	Nature of receiving water		Flow rate [1000 m³/d]	Cd [t]	Hg [t]	Cu [t]	Pb [t]	Zn [t]	g-HCH [kg]	PCBs (1) [kg]	NH4-N [kt]	NO3-N [kt]	PO4-P [kt]	Total N [kt]	Total P [kt]	SPM(2) [kt]
Ems Estuary	Estuary	(lower estimate)	10	0	0	0.02	0	0.03	NI	NI	0.03	0.02	0.0003	0.04	0.0008	0.05
(downstream of Herbrum)		(upper estimate)		0.01	0.01	0.02	0.01	0.03	NI	NI	0.03	0.02	0.0003	0.04	0.0008	0.05
Jade	Estuary	(lower estimate)	7.3	0	0.001	0.08	0.004	0.06	NI	NI	0.001	0.001	NI	NI	0.001	NI
(area Wilhelmshaven)		(upper estimate)		0.001	0.002	0.08	0.006	0.06	NI	NI	0.001	0.001	NI	NI	0.001	NI
Weser Estuary	Estuary	(lower estimate)	39	0.05	0	0.0	1.0	9.0	NI	NI	0.0008	0.001	NI	0.001	0.002	NI
(area Nordenham)		(upper estimate)		0.05	0.004	0.05	1.0	9.0	NI	NI	0.0008	0.001	NI	0.001	0.002	NI
Elbe Estuary	Estuary	(lower estimate)	70	0	0	0	0	NI	NI	0	NI	0.5	0.01	0.8	0.04	NI
		(upper estimate)		0.01	0.01	0.1	0.5	NI	NI	1	NI	0.5	0.01	0.8	0.04	NI
		Total:	**126**	**0.05**	**0.001**	**0.1**	**1.1**	**9.1**	**NI**	**0**	**0.03**	**0.5**	**0.01**	**0.8**	**0.04**	**0.05**
				0.07	**0.03**	**0.2**	**1.6**	**9.1**	**NI**	**1**	**0.03**	**0.5**	**0.01**	**0.8**	**0.04**	**0.05**

(1) IUPAC Nos 28, 52, 101, 118, 153, 138, 180
(2) Suspended particulate matter
[(3) data without Bremen]
NI: No information

Table 5c. Direct discharges to the maritime area in 1997 by Germany

Total direct discharges			Quantities --->												
Discharge area		Flow rate [1000 m³/d]	Cd [t]	Hg [t]	Cu [t]	Pb [t]	Zn [t]	g-HCH [kg]	PCBs (1) [kg]	NH4-N [kt]	NO3-N [kt]	PO4-P [kt]	Total N [kt]	Total P [kt]	SPM(2) [kt]
Ems Estuary	(lower estimate)	85	0	0	0.5	0.3	2.7	0	0.01	0.4	0.3	0.02	0.8	0.1	0.5
	(upper estimate)		0.02	0.02	0.5	0.3	2.7	0.01	0.01	0.4	0.3	0.02	0.8	0.1	0.5
Jade	(lower estimate)	32	0.01	0.01	0.3	0.1	1.1	0.01	0.01	0.001	0.1	0.005	0.2	0.04	NI
	(upper estimate)		0.01	0.01	0.3	0.1	1.1	0.01	0.01	0.001	0.1	0.005	0.2	0.04	NI
Weser Estuary	(lower estimate)	268	0.05	0	1.5	1.8	17	0.01	0.03	1.6	0.9	0.04	2.1	0.3	1.1
	(upper estimate)		0.06	0.02	1.6	1.8	17	0.3	1.8	1.6	0.9	0.04	2.1	0.3	1.1
Elbe Estuary	(lower estimate)	145	0	0	0	0	0	NI	0	NI	0.7	0.03	1.2	0.06	0.4
	(upper estimate)		0.02	0.02	0.6	0.6	5.0	NI	1	NI	0.7	0.03	1.2	0.06	0.4
	Total:	**530**	**0.06**	**0.01**	**2.3**	**2.2**	**21**	**0.02**	**0.05**	**2.0**	**2.0**	**0.1**	**4.3**	**0.5**	**2.0**
			0.1	**0.07**	**3.0**	**2.8**	**26**	**0.3**	**2.9**	**2.0**	**2.0**	**0.1**	**4.3**	**0.5**	**2.0**

(1) IUPAC Nos 28, 52, 101, 118, 153, 138, 180
(2) Suspended particulate matter
NI: No information

Table 6a. Riverine inputs to the maritime area in 1997 by Germany

Main riverine input				Quantities --->												
Discharge area	Flow rate [1000 m³/d]			Cd [t]	Hg [t]	Cu [t]	Pb [t]	Zn [t]	g-HCH [kg]	PCBs (1) [kg]	NH4-N [kt]	NO3-N [kt]	PO4-P [kt]	Total N [kt]	Total P [kt]	SPM(2) [kt]
	1997		LTA													
Ems	5470		7560 (5)	0.4	0.02	7.0	3.6	57	6.1	10	0.6	13	0.07	16	0.5	25
(Herbrum: 70 %)				0.4	0.02	7.1	3.7	57	6.1	12	0.6	13	0.07	16	0.5	47
Weser	25155		30900 (6)	2.9	0.2	46	64	314	20	27	1.3	41	0.9	50	2.5	558
(Farge: 90%)				2.9	0.2	46	64	314	20	33	1.4	41	0.9	50	2.5	575
Elbe Estuary	63600		74700 (7)	2.7	1.6	88	71	620	340	0	4.2	85	1.4	120	4.6	810
				2.7	1.6	88	71	620	340	130	4.2	85	1.4	120	4.6	810
Elbe tributaries (3)	2400		2300 (8)	0.2	0.08	4.2	8.7	39	NI	NI	0.4	3.8	0.07	6.3	0.4	100
				0.2	0.08	4.2	8.7	39	NI	NI	0.4	3.8	0.07	6.3	0.4	100
Elbe tributaries (4)	2400		2600 (9)	0.09	0.005	2.4	1.9	16	2.0	0	0.3	3.2	0.03	4.4	0.2	27
				0.09	0.005	2.4	1.9	16	2.0	3.0	0.3	3.2	0.03	4.4	0.2	27
Eider	1284		2275(10)	0.02	0.0046	1.2	0.4	4.5	1.4	NI	0.4	3.5	0.08	4.0	0.2	7.1
				0.03	0.0046	1.2	0.4	4.5	1.4	NI	0.4	3.5	0.08	4.0	0.2	7.1
Total	**100309**		**120469**	**6.2**	**1.9**	**149**	**149**	**1051**	**370**	**37**	**7.2**	**149**	**2.5**	**201**	**8.2**	**1527**
				6.3	**1.9**	**149**	**149**	**1051**	**370**	**178**	**7.2**	**149**	**2.5**	**201**	**8.2**	**1566**

(1) IUPAC Nos 28, 52, 101, 118, 153, 138, 180; Elbe, Weser and Ems also No 31
(2) Suspended particulate matter
(3) Left side tributaries: Este, Lühe, Schwinge, Oste
(4) Right side tributaries: Pinnau, Krückau, Stör
ND: Not detected
LTA: Long-term average flow:
(5) 1942 - 1996
(6) 1901 - 1994
(7) 1926 - 1991
(8) 1961 - 1989
(9) 1971 - 1989
(10) 1987 - 1997

Table 7a. Contaminant concentrations of German rivers discharging to the maritime area

Main river Ems				Contaminant concentrations -->												
Discharge area	Flow rate [1000 m³/d]		Mean or	Cd	Hg	Cu	Pb	Zn	g-HCH	PCBs (1)	NH4-N	NO3-N	PO4-P	Total N	Total P	SPM(2)
	annual	LTA	median?	[µg/l]	[µg/l]	[µg/l]	[µg/l]	[µg/l]	[ng/l]	[ng/l]	[mg/l]	[mg/l]	[mg/l]	[mg/l]	[mg/l]	[mg/l]
Ems 1997	5470	7560	Mean	0.18	0.009	2.5	1.3	22	2.4	2	0.3	4.7	0.03	5.8	0.2	4.6
(Herbrum: 70 %)			upper	0.21	0.012	2.6	1.4	22	2.4	3.4	0.3	4.7	0.03	5.8	0.2	21
Minimum	1370			< 0.05	< 0.005	< 0.5	< 0.5	4.6	0.7	< 1.8	< 0.05	3.1	< 0.02	3.6	0.06	< 20
Maximum	25800			0.95	0.02	4.7	4.0	71	10	11	0.7	8.1	0.06	10	0.31	33
> 70 % > d.l. ?			yes/no	no	yes	yes	yes	yes	yes	no	yes	yes	no	yes	yes	no
n				***12***	***12***	***12***	***12***	***12***	***12***	***12***	***12***	***12***	***12***	***12***	***12***	***12***

(1) IUPAC Nos 28, 52, 101, 118, 153, 138, 180 LTA: Long-term average flow Ems: 1942 - 1996
(2) Suspended particulate matter
ND: Not detected > 70 % > d.l. ?: yes if more than 70 % of concentration measurements were above the detection limit (cf. Table 8

Table 7a. Contaminant concentrations of German rivers discharging to the maritime area (continued)

Main river Weser				Contaminant concentrations -->												
Discharge area	Flow rate [1000 m³/d]		Mean or	Cd	Hg	Cu	Pb	Zn	g-HCH	PCBs (1)	NH4-N	NO3-N	PO4-P	Total N	Total P	SPM(2)
	annual	LTA	median?	[µg/l]	[µg/l]	[µg/l]	[µg/l]	[µg/l]	[ng/l]	[ng/l]	[mg/l]	[mg/l]	[mg/l]	[mg/l]	[mg/l]	[mg/l]
Weser 1997	25155	30900	Mean	0.3	0.02	4.5	5.3	29	2.08	1.5	0.1	3.8	0.1	4.7	0.2	46
(Farge: 90%)			upper	0.3	0.02	4.5	5.3	29	2.08	1.5	0.1	3.8	0.1	4.7	0.2	46
Minimum	11347			0.08	0.01	1.6	2.5	16	1.0	0.9	0.05	3.0	0.02	3.7	0.1	20
Maximum	102895			0.6	0.04	7.0	12	51	5.0	6.7	0.4	5.7	0.80	7.1	0.4	110
> 70 % > d.l. ?			yes/no	yes	yes	yes	yes	yes	yes	no	yes	yes	yes	yes	yes	yes
n				***12***	***12***	***12***	***12***	***12***	***12***	***12***	***12***	***12***	***12***	***12***	***12***	***12***

(1) IUPAC Nos 28, 52, 101, 118, 153, 138, 180 LTA: Long-term average flow Weser: 1901 - 1994
(2) Suspended particulate matter
ND: Not detected > 70 % > d.l. ?: yes if more than 70 % of concentration measurements were above the detection limit (cf. Table 8

Table 7a. Contaminant concentrations of German rivers discharging to the maritime area (continued)

Main river Eider				Contaminant concentrations -->												
Discharge area	Flow rate [1000 m³/d]		Mean or	Cd	Hg	Cu	Pb	Zn	g-HCH	PCBs (1)	NH4-N	NO3-N	PO4-P	Total N	Total P	SPM(2)
	annual	LTA	median?	[µg/l]	[µg/l]	[µg/l]	[µg/l]	[µg/l]	[ng/l]	[ng/l]	[mg/l]	[mg/l]	[mg/l]	[mg/l]	[mg/l]	[mg/l]
Eider 1997	1284	2275	Mean	0.018	0.005	1.3	0.5	4.03	2.3	NI	0.3	2.7	0.09	4.2	0.2	8
			upper	0.027	0.005	1.3	0.6	4.03	2.3	NI	0.3	2.7	0.09	4.2	0.2	8
Minimum	422			< 0.02	0.002	0.7	< 0.2	1.2	1.1		0.03	0.6	0.03	1.8	0.07	< 1.0
Maximum	3414			0.06	0.01	1.8	2.3	8.2	5.9		0.8	7.1	0.2	8.5	0.3	32
> 70 % > d.l. ?			yes/no	no	yes	yes	yes	yes	yes		yes	yes	yes	yes	yes	yes
n				***26***	***26***	***26***	***26***	***26***	***26***		***26***	***26***	***26***	***26***	***26***	***26***

(1) IUPAC Nos 28, 52, 101, 118, 153, 138, 180 LTA: Long-term average flow Eider: 1987 - 1997
(2) Suspended particulate matter
ND: Not detected > 70 % > d.l. ?: yes if more than 70 % of concentration measurements were above the detection limit (cf. Table 8

Table 7a. Contaminant concentrations of German rivers discharging to the maritime area (continued)

Main river Elbe				Contaminant concentrations -->												
Discharge area	Flow rate [1000 m³/d]		Mean or	Cd	Hg	Cu	Pb	Zn	g-HCH	PCBs (1)	NH4-N	NO3-N	PO4-P	Total N	Total P	SPM(2)
	annual	LTA	median?	[µg/l]	[µg/l]	[µg/l]	[µg/l]	[µg/l]	[ng/l]	[ng/l]	[mg/l]	[mg/l]	[mg/l]	[mg/l]	[mg/l]	[mg/l]
Elbe Estuary	63600	74700	Median	0.1	0.08	4.4	3.4	28	19	0	0.2	3.6	0.08	5.1	0.3	43
1997			upper	0.1	0.08	4.4	3.4	28	19	6.0	0.2	3.6	0.08	5.1	0.3	43
Minimum	27500			< 0.08	0.03	2.8	1.7	15	< 4.0	< 6.0	0.05	2.4	< 0.02	4.2	0.2	23
Maximum	177000			0.3	0.2	6.5	6.7	51	40	< 6.0	0.8	5.5	0.1	7.4	0.4	73
> 70 % > d.l. ?			yes/no	yes	yes	yes	yes	yes	yes	no	yes	yes	yes	yes	yes	yes
n			***n***	***24***	***24***	***24***	***24***	***24***	***24***	***12***	***24***	***24***	***24***	***24***	***24***	***23***

(1) IUPAC Nos 28, 52, 101, 118, 153, 138, 180 LTA: Long-term average flow Elbe: 1926 - 1991
(2) Suspended particulate matter
NI: No information > 70 % > d.l. ?: yes if more than 70 % of concentration measurements were above the detection limit (cf. Table 8

Table 7b. Contaminant concentrations of German rivers (tributaries) discharging to the maritime area

Left side tributaries of the Elbe				Contaminant concentrations -->												
Discharge area	Flow rate [1000 m³/d]		Mean or	Cd	Hg	Cu	Pb	Zn	g-HCH	PCBs (1)	NH4-N	NO3-N	PO4-P	Total N	Total P	SPM(2)
	annual	LTA	median?	[µg/l]	[µg/l]	[µg/l]	[µg/l]	[µg/l]	[ng/l]	[ng/l]	[mg/l]	[mg/l]	[mg/l]	[mg/l]	[mg/l]	[mg/l]
Elbe tributary (3)	2400	2300	Median	0.2	0.07	4.3	6.9	33	NI	NI	0.3	3.0	0.06	5.4	0.3	52
1997			upper	0.2	0.07	4.3	6.9	33	NI	NI	0.3	3.0	0.06	5.4	0.3	52
Minimum	610			< 0.05	0.02	< 1.6	1.1	< 10			< 0.05	1.3	0.02	2.8	0.1	2.6
Maximum	11000			1.0	0.6	28	61	180			1.0	8.0	0.3	10	1.5	510
> 70 % > d.l. ?			yes/no	yes	yes	yes	yes	yes			yes	yes	yes	yes	yes	yes
n				***13***	***13***	***13***	***13***	***13***			***23***	***23***	***23***	***23***	***23***	***23***

(1) IUPAC Nos 28, 52, 101, 118, 153, 138, 180 — LTA: Long-term average flow — Oste only: 1961 - 1987
(2) Suspended particulate matter — Este, Lühe, Schwinge, Oste: 1961 - 1989
(3) Left side tributaries: Este, Lühe, Schwinge, Oste
NI: No information — > 70 % > d.l. ?: yes if more than 70 % of concentration measurements were above the detection limit (cf. Table 8

Table 7b. Contaminant concentrations of German rivers (tributaries) discharging to the maritime area (continued)

Right side tributaries of the Elbe				Contaminant concentrations -->												
Discharge area	Flow rate [1000 m³/d]		Mean or	Cd	Hg	Cu	Pb	Zn	g-HCH	PCBs (1)	NH4-N	NO3-N	PO4-P	Total N	Total P	SPM(2)
	annual	LTA	median?	[µg/l]	[µg/l]	[µg/l]	[µg/l]	[µg/l]	[ng/l]	[ng/l]	[mg/l]	[mg/l]	[mg/l]	[mg/l]	[mg/l]	[mg/l]
Elbe tributary (3)	2400	2600	Median	0.09	0.006	2.7	1.4	16	2.0	0	0.2	2.7	0.02	3.9	0.1	12
1997			upper	0.09	0.006	2.7	1.4	16	2.0	3.0	0.2	2.7	0.02	3.9	0.1	12
Minimum	610			0.02	0.001	1.2	0.3	5.6	1.4	< 3.0	0.03	0.9	< 0.005	1.5	0.06	< 1.0
Maximum	10600			0.2	0.03	6.3	6.8	49	3.2	< 3.0	0.7	10	0.8	12	0.3	130
> 70 % > d.l. ?			yes/no	yes	yes	yes	yes	yes	yes	no	yes	yes	yes	yes	yes	yes
n				***12***	***12***	***12***	***12***	***12***	***3***	***3***	***13***	***13***	***13***	***13***	***13***	***13***

(1) IUPAC Nos 28, 52, 101, 118, 153, 138, 180 — LTA: Long-term average flow — Stör only: 1971 - 1987
(2) Suspended particulate matter — Pinnau, Krückau, Stör: 1971 - 1989
(3) Right side tributaries: Pinnau, Krückau, Stör
NI: No information — > 70 % > d.l. ?: yes if more than 70 % of concentration measurements were above the detection limit (cf. Table 8

Table 8. Detection limits for contaminant concentrations of German inputs to the maritime area

				Detection limits for contaminant concentrations -->												
Sampling point	Type (3)			Cd [µg/l]	Hg [µg/l]	Cu [µg/l]	Pb [µg/l]	Zn [µg/l]	g-HCH [ng/l]	PCBs (1) [ng/l]	NH4-N [mg/l]	NO3-N [mg/l]	PO4-P [mg/l]	Total N [mg/l]	Total P [mg/l]	SPM(2) [mg/l]
Ems	S			NL	NL	NL	NL	NL	NL	NL	NL	NL	NL	NL	NL	NL
	I			0.5	0.5	30	1.0	10	ND	ND	NL	NL	NL	NL	0.02	NL
	R			0.05	0.005	0.5	0.5	1.0	0.08	1.8	0.05	0.1	0.02	1.0	0.02	20
Weser	S			NL	NL	NL	NL	NL	NL	NL	NL	NL	NL	NL	NL	NL
	I			0.5	0.5	30	1.0	10	ND	ND	NL	NL	NL	NL	0.02	ND
	R			0.05	0.005	0.5	0.5	1.0	0.08	1.8	0.05	0.1	0.02	1.0	0.02	20
Elbe	S			NL	NL	NL	NL	NL	ND	ND	ND	NL	NL	NL	NL	NL
	I			0.1	0.1	1.0	1.0	ND	ND	1.0	ND	0.1	0.01	1.0	0.05	ND
	R			0.02	0.001	1.0	0.2	5.0	2.0	1.0	0.05	0.5	0.01	0.5	0.05	1.0
Eider	R			0.02	0.001	0.5	0.2	1.0	2.0	1.0	0.01	0.05	0.005	0.05	0.01	1.0
Jade	S			NL	NL	NL	NL	NL	NL	NL	ND	NL	NL	NL	NL	NL
	I			0.5	0.5	30	1.0	10	ND	ND	ND	ND	ND	ND	0.02	ND

ND **Not detected**
NL **No limit of detection can be given because all figures are estimates.**

 # specify here to which part of the inputs this table relates

(1) IUPAC Nos 28, 52, 101, 118, 153, 138, 180; make separate list if needed
(2) Suspended particulate matter
(3) S: sewage; I: Industrial discharges; R: riverine inputs (main and tributary
ND: Not detected

Annex 5

IRELAND

Annual report on riverine inputs and direct discharges to Convention waters during the year 1997 by Ireland

Annual report on riverine inputs and direct discharges by Ireland to Convention waters during the year 1997

Name, address and contact numbers of reporting authority to which any further enquiry should be addressed:

Environmental Protection Agency
Pottery Road
Dun Laoghaire
Co Dublin, Ireland.
Tel: + 353 1 2852122
Fax: + 353 1 2851766
(Contact Person: Dr Paul Toner email p.toner@epa.ie)

A. General information

Table 1: General overview of river systems (for riverine inputs) and direct discharge areas (for direct discharges) included in the data report

Country: IRELAND			
Name of river, subarea and discharge area[1]	Nature of the receiving water[2]	optional: national reference number	optional: map reference number
Irish Sea	Estuary/Coastal Water	See details below	
Celtic Sea	do.	do.	
Atlantic	do.	do.	

[1] i.e. name of estuary or length of coastline
[2] i.e. estuary or coastal water; if an estuary, state the tidal range and the daily flushing volume

IRISH SEA DISCHARGE AREA:

From border with N.Ireland (54° 7' N, 6° 18' W) to Hook Head (52° 7' N, 6° 56' W)

CELTIC SEA DISCHARGE AREA:

From Hook Head to Loop Head (52° 33' N, 9° 56' W)

ATLANTIC DISCHARGE AREA:
From Loop Head to border with N. Ireland (55° 4' N, 7° 16' W)

B. Total riverine inputs and direct discharges for the year 1997

B.1 Comments on the Total Riverine Inputs and Direct Discharges as presented in Table 4a

[none]

C. Direct discharges for the year 1997

Sewage Effluents (Table 5a.)

C.1 Describe the methods of measurement and calculation used, including information on the number of samples and the concentration upon which the measurement is based (ref.: Section 6 of the Principles), including for those under voluntary reporting:

No new Data since 1990. 1990 estimates are likely to reflect the current situation.

C.2 Describe the determinands, other than those specified in paragraph 2.1 of the Principles, that are included in the current monitoring programme and which may be relevant for the Comprehensive Study on Riverine Inputs and Direct Discharges (voluntary reporting):

[none]

Industrial Effluents (Table 5b.)

C.3 Describe the methods of measurement and calculation used, including information on the number of samples and the concentration upon which the measurement is based (ref.: Section 6 of the Principles), including for those under voluntary reporting:

No new data since 1990.

C.4 Give any other relevant information (e.g. proportion of substance discharged as insoluble material):

[none]

C.5 Give any available information on other discharges directly to Convention Waters - through e.g. urban run-off and stormwater overflows - that are not covered by the data in tables 5a. and 5b.:

[none]

C.6 Describe the determinands, other than those specified in paragraph 2.1 of the Principles, that are included in the current monitoring programme and which may be relevant for the Comprehensive Study on Riverine Inputs and Direct Discharges (voluntary reporting):

[none]

D. Riverine inputs for the year 1997

Main Rivers (Tables 6a. and 7a.)

D.1 Describe the methods of measurement and calculation used, including information on the number of samples and the concentration (Table 7a.) upon which the measurement is based (ref.: Section 5 of the Principles), including for those under voluntary reporting:

Load = flow-weighted annual mean concentration x annual flow.

Average 8 samples per river, in Oct- May period.

D.2 Give any other relevant information (e.g. proportion of substance transported by the river in particulate form):

Oxidised N (NO_2 + NO_3) for nitrate. Mercury not measured as all concentrations have been less than the detection limit of 0.1 ug/l currently achieved. Lindane is not being measured due to lack of resources.

D.3 Describe the determinands, other than those specified in paragraph 2.1 of the Principles, that are included in the current monitoring programme and which may be relevant for the Comprehensive Study on Riverine Inputs and Direct Discharges (voluntary reporting):

Biochemical oxygen demand

Tributary Rivers (Tables 6b. and 7b.)

D.4 Describe the methods of measurement and calculation used, including information on the number of samples and the concentration (Table 7b.) upon which the measurement is based (ref.: Section 5 of the Principles):

Loads in these cases are estimated by extrapolation from those calculated for relevant main rivers on the basis of catchment areas.

D.5 Give any other relevant information (e.g. proportion of substance transported by the river in particulate form):

[none]

D.6 Describe the determinands, other than those specified in paragraph 2.1 of the Principles, that are included in the current monitoring programme and which may be relevant for the Comprehensive Study on Riverine Inputs and Direct Discharges (voluntary reporting):

[none]

D.7 Give any available information on other inputs - through e.g. polder effluents or from coastal areas - that are not covered by data in tables 6a. and 6b.:

[none]

E. Limits of detection

E.1 Information concerning limits of detection should be presented in Table 8 which includes different columns for rivers/tributaries, sewage effluents and industrial effluents. Any important comments may be presented here.

[none]

F. National Comments

F.1 Give a general summary of the main results as presented in tables 5,6 and 7 and comment, as appropriate, of these results.

The data returned for 1997 are similar to those for the previous seven years. Direct inputs are again equated with those estimated in 1990 as more recent data are not yet available. The riverine loads are aggregated by the three sea areas, Irish Sea, Celtic Sea and Atlantic.

F.2 Indicate any significant change in inputs and concentrations in comparison to previous years. Comment on these changes as appropriate.

In general, the calculated loads fall within the ranges recorded for the 1990-1996 period. In the case of the Irish Sea rivers, the loads for some of the substances in 1997, e.g. Total P, were at or exceeded the upper end of the latter ranges. This was due mainly to the undertaking of a sampling run in August 1997 which corresponded with flood conditions and which led to the calculation of a relatively high flow-weighted annual mean concentration for some parameters. Concentration ranges in 1997 were similar to those recorded in earlier years. Most samples had cadmium concentrations less than the detection limit with the exception of those from the Avoca; this river is contaminated by drainage waters from a defunct copper mine and also shows relatively high concentrations of the other metals measured. In previous years this river also carried very high nitrogen loads due to discharges from a fertiliser plant. These have been reduced considerably since 1994 (cf. ammonia loads).

F.3 Indicate and explain, if appropriate:

- where and why the applied procedures do not comply with agreed procedures
- significant changes in monitoring sites, important for comparison of the data before and after the date of the change
- incomplete or distorted data

Sampling frequency, especially in the rivers discharging to the Atlantic, was relatively low in 1997 due to other calls on resources.

Measurement of Kjeldahl N/Total N was not possible in 1997 due to analytical problems.

Mercury data are not being reported due to the fact that all measurements to date have shown that the concentrations in the rivers are less than the currently achieved detection limit of 0.15 ug/l.

Organochlorines are not being measured currently due to lack of resources.

Table 5a. Direct inputs to the maritime area in 1997 by Ireland

Sewage effluents*			Quantities --->											
Discharge area	Nature of receiving water	Flow rate [1000 m3/d]	Cd [t]	Hg [t]	Cu [t]	Pb [t]	Zn [t]	g-HCH [kg]	PCBs (1) [kg]	NH4-N [kt]	NO3-N [kt]	PO4-P [kt]	Total N [kt]	Total P [kt]	SPM(2) [kt]
Irish Sea	Estuarine and coastal waters		0.02	NI	3.4	1.5	29	NI	NI	NI	NI	NI	3.7	0.9	21.4
Celtic Sea	Estuarine and coastal waters		0.01	NI	1.1	0.5	9.2	NI	NI	NI	NI	NI	1.3	0.4	8.6
Atlantic	Estuarine and coastal waters		0.00	NI	0.4	0.2	3.1	NI	NI	NI	NI	NI	0.4	0.1	2.6
Total:			0.03		4.9	2.2	41						5.4	1.4	33

Table 5b. Direct inputs to the maritime area in 1997 by Ireland

Industrial effluents*			Quantities --->											
Discharge area	Nature of receiving water	Flow rate [1000 m3/d]	Cd [t]	Hg [t]	Cu [t]	Pb [t]	Zn [t]	g-HCH [kg]	PCBs (1) [kg]	NH4-N [kt]	NO3-N [kt]	PO4-P [kt]	Total N [kt]	Total P [kt]	SPM(2) [kt]
Irish Sea	Estuarine and coastal waters		0.04	NI	4.1	1.8	34	NI	NI	NI	NI	NI	3.1	0.7	17
Celtic Sea	Estuarine and coastal waters		0.013	NI	2.1	3.9	12	NI	NI	NI	NI	NI	1.3	0.3	10.0
Atlantic	Estuarine and coastal waters		0.005	NI	0.5	0.2	4.6	NI	NI	NI	NI	NI	0.3	0.086	1.7
Total:			0.06		6.7	5.9	51						4.8	1.1	28

NI: No information

(1) IUPAC Nos 28, 52, 101, 118, 153, 138, 180

(2) Suspended particulate matter

* 1990 data, since the basis for calculation remained unchanged.

Table 5c. Direct inputs to the maritime area in 1997 by Ireland

Total direct discharges*			Quantities --->											
Discharge area	Nature of receiving water	Flow rate [1000 m3/d]	Cd [t]	Hg [t]	Cu [t]	Pb [t]	Zn [t]	g-HCH [kg]	PCBs (1) [kg]	NH4-N [kt]	NO3-N [kt]	PO4-P [kt]	Total N [kt]	Total P [kt]	SPM(2) [kt]
Irish Sea	Estuarine and coastal waters		0.06	NI	7.5	3.3	63	NI	NI	NI	NI	NI	6.8	1.6	38
Celtic Sea	Estuarine and coastal waters		0.02	NI	3.2	4.4	22	NI	NI	NI	NI	NI	2.7	0.7	19
Atlantic	Estuarine and coastal waters		0.01	NI	0.8	0.4	7.7	NI	NI	NI	NI	NI	0.7	0.2	4.3
Total:			0.09		12	8.1	92						10	2.4	61

NI: No information

(1) IUPAC Nos 28, 52, 101, 118, 153, 138, 180
(2) Suspended particulate matter

* 1990 data, since the basis for calculation remained unchanged.

Table 6a. Riverine inputs to the maritime area in 1997 by Ireland

Main riverine inputs				Quantities --->														
Discharge area	Flow rate [1000 m3/d]			Cd [t]	Hg [t]	Cu [t]	Pb [t]	Zn [t]	g-HCH [kg]	PCBs (1) [kg]	NH4-N [kt]	NO3-N [kt]	TKN (2) [t]	PO4-P [kt]	Total N [kt]	Total P [kt]	SPM (3) [kt]
	1997		LTA														
Irish Sea: Boyne	3078		3555	0.06 0.08	NM	2.9 2.9	3.9 3.9	18 18	NM	NM	0.09	4.6	NM	0.09	NM	0.2	23
Irish Sea: Liffey	1067		1555	0.01 0.02	NM	0.8 0.8	0.09 0.09	4.8 4.8	NM	NM	0.1	1.1	NM	0.06	NM	0.1	6.1
Irish Sea: Avoca	1668		1711	0.3 0.3	NM	8.0 8.0	10.1 10.1	144 144	NM	NM	1.4	1.8	NM	0.01	NM	0.07	11
Irish Sea: Slaney	4035		3297	0.08 0.1	NM	3.5 3.5	1.7 1.8	13 13	NM	NM	0.1	6.5	NM	0.08	NM	0.3	35
Total Irish Sea:	9848			0.4 0.5		15 15	16 16	179 179			1.7	14		0.2		0.7	76
Celtic Sea: Barrow	3466		3235	0.09 0.1	NM	2.8 2.8	2.2 2.2	16 16	NM	NM	0.1	5.5	NM	0.1	NM	0.3	40
Celtic Sea: Nore	3884		3742	0.09 0.1	NM	3.9 3.9	3.6 3.7	22 23	NM	NM	0.2	4.8	NM	0.2	NM	0.5	60
Celtic Sea: Suir	6695		5855	0.08 0.2	NM	4.2 4.2	3.7 3.9	41 41	NM	NM	0.2	6.4	NM	0.2	NM	0.4	49
Celtic Sea: Blackwater	7404		7303	0.1 0.2	NM	7.6 7.6	15 15	29 29	NM	NM	0.5	8.2	NM	0.2	NM	0.5	29
Celtic Sea: Lee	3342		3405	0.00 0.06	NM	2.5 2.5	1.3 1.6	8.9 8.9	NM	NM	0.08	3.5	NM	0.05	NM	0.09	6.9
Celtic Sea: Bandon	1767		1808	0.01 0.04	NM	1.2 1.2	2.0 2.1	8.6 8.6	NM	NM	0.06	2.8	NM	0.04	NM	0.07	4.0
Celtic Sea: Deel	625		622	0.06 0.06	NM	1.4 1.4	1.0 1.0	3.5 3.5	NM	NM	0.1	0.6	NM	0.08	NM	0.2	12
Celtic Sea: Maigue	1505		1397	0.06 0.06	NM	2.4 2.4	1.4 1.4	10 10	NM	NM	0.2	1.3	NM	0.2	NM	0.4	20
Celtic Sea: Shannon (old channel)	3700	(comb.	53.88 206.38)	0.07 0.09	NM	3.8 3.8	5.1 5.1	23 23	NM	NM	0.2	2.0	NM	0.1	NM	0.2	31
Celtic Sea: Shannon (tailrace)	13742		152.5	0.04 0.262	NM	7.5 7.5	6.3 6.6	31 31	NM	NM	0.1	7.5	NM	0.2	NM	0.5	30
Celtic Sea: Fergus	1451		1657	0.02 0.03	NM	1.1 1.1	0.5 0.5	3.8 3.8	NM	NM	0.04	0.6	NM	0.02	NM	0.05	2.8
Total Celtic Sea:	47581			0.6 1.2		38 38	42 43	196 197			1.7	43		1.2		3.2	285

Table 6a. Continued

Main riverine inputs				Quantities --->													
Discharge area	Flow rate [1000 m3/d]			Cd [t]	Hg [t]	Cu [t]	Pb [t]	Zn [t]	g-HCH [kg]	PCBs (1) [kg]	NH4-N [kt]	NO3-N [kt]	TKN (2) [t]	PO4-P [kt]	Total N [kt]	Total P [kt]	SPM (3) [kt]
	1997		LTA														
Atlantic: Corrib	7356		8447	0 0.1	NM	1.8 2.7	2.8 3.1	11 11	NM	NM	0.08 0.09	2.7	NM	0.02	NM	0.1	7.4
Atlantic: Moy	4203		5054	0.07 0.1	NM	1.9 1.9	2.9 3.0	14 14	NM	NM	0.06 0.06	1.3	NM	0.03	NM	0.2	29
Atlantic : Erne	7215		8719	0.01 0.1	NM	5.7 5.7	1.5 2.0	26 26	NM	NM	0.01 0.03	2.3	NM	0.1	NM	0.3	6.8
Total Atlantic:	18774			0.08 0.4		9.4 10	7.2 8.1	51 51			0.1 0.2	6.3		0.2		0.6	43
Grand total:				1.1 2.0		63 64	65 67	426 426			3.6 3.6	63		1.6		4.5	404

LTA: Long-term average flow
NM: Not measured
(1) IUPAC Nos 28, 52, 101, 118, 153, 138, 180
(2) Organic-N (Kjeldahl)
(3) Suspended particulate matter

Table 6b. Riverine inputs to the maritime area in 1997 by Ireland

Inputs of tributary rivers		Quantities --->													
Discharge area	Catchment Areas	Cd [t]	Hg [t]	Cu [t]	Pb [t]	Zn [t]	g-HCH [kg]	PCBs (1) [kg]	NH4-N [kt]	NO3-N [kt]	TKN (2) [t]	PO4-P [kt]	Total N [kt]	Total P [kt]	SPM (3) [kt]
Irish Sea	48 minor catchment areas: 4500 km2	0.1 0.2	NM	6.9 6.9	7.9 7.9	30 30	NM	NM	0.2 0.2	8.8	NM	0.2	NM	0.5	58
Celtic Sea	100 minor catchment areas: 9800 km2	0.3 0.5	NM	20 20	27 29	83 83	NM	NM	1.1 1.1	24	NM	0.6	NM	1.3	84
Atlantic	180 minor catchment areas: 11498 km2	0.2 0.5	NM	11 12	10 11	61 61	NM	NM	0.3 0.3	7.4	NM	0.2	NM	0.7	81
Total:		0.6 1.2		38 38	45 48	173 173			1.6 1.6	40		0.9		2.5	223

NM: Not measured
(1) IUPAC Nos 28, 52, 101, 118, 153, 138, 180
(2) Organic-N (Kjeldahl)
(3) Suspended particulate matter

Table 6c. Riverine inputs to the maritime area in 1997 by Ireland

Total riverine inputs		Quantities --->													
Discharge area	Flow rate [1000 m3/d]	Cd [t]	Hg [t]	Cu [t]	Pb [t]	Zn [t]	g-HCH [kg]	PCBs (1) [kg]	NH4-N [kt]	NO3-N [kt]	TKN [t]	PO4-P [kt]	Total N [kt]	Total P [kt]	SPM(2) [kt]
Irish Sea	(lower estimate)	0.6		22	24	209			1.9	23		0.4		1.2	134
	(upper estimate)	0.7		22	24	209			1.9						
Celtic Sea	(lower estimate)	0.9		58	69	279			2.9	67		1.8		4.6	369
	(upper estimate)	1.7		58	72	279			2.9						
Atlantic	(lower estimate)	0.3		20	18	111			0.4	14		0.3		1.2	124
	(upper estimate)	0.9		22	19	112			0.5						
Total:	(lower est)	1.7		101	110	599			5.2	103		2.6		7.0	627
	(upper est)	3.2		102	115	600			5.3						

NM: Not measured

(1) IUPAC Nos 28, 52, 101, 118, 153, 138, 180

(2) Suspended particulate matter

Table 7. Contaminant concentrations of Irish rivers discharging to the maritime area

Main riverine inputs				Contaminant Concentrations --->														
Discharge area	Flow rate [1000 m³/d] annual	Flow rate [1000 m³/d] LTA	Mean or median?	Cd [µg/l]	Hg [µg/l]	Cu [µg/l]	Pb [µg/l]	Zn [mg/l]	g-HCH [ng/l]	PCBs (1) [ng/l]	NH4-N [mg/l]	NO3-N [mg/l]	TKN [mg/l]	PO4-P [mg/l]	Total N [mg/l]	Total P [mg/l]	SPM(2) [mg/l]
Irish Sea: Boyne - 1997	3077.6	3555.4	Median	<0.05		1.6	1.5	0.01			0.03	3.9		0.07		0.15	6
Minimum				<0.05		0.9	<0.5	0.001			<0.01	1.5		0.04		0.12	1.2
Maximum				0.1		6	11	0.05			0.2	5.1		0.2		0.4	64
> 70 % > d.l. ?			*yes/no*	no		yes	yes	yes			yes	yes		yes		yes	yes
n				*7*		*7*	*7*	*7*			*7*	*7*		*7*		*7*	*7*
Irish Sea: Liffey - 1997	1067.0	1555.2	Median	<0.05		1.5	0.7	0.01			0.2	3.77		0.20		0.3	7
Minimum				<0.05		1	<0.5	<.001			0.02	1.8		0.127		0.20	2
Maximum				0.1		3.2	4.7	0.023			0.5	4.27		0.2		0.5	29.8
> 70 % > d.l. ?			*yes/no*	no		yes	no	yes			yes	yes		yes		yes	
n				*7*		*7*	*7*	*7*			*7*	*7*		*7*		*7*	*7*
Irish Sea: Avoca - 1997	1667.5	1710.7	Median	0.41		17	7.5	0.3			1.5	3.1		0.04		0.55	7.4
Minimum				0.3		6	1.7	0.08			0.1	0.6		0.01		0.03	2.2
Maximum				0.8		34	42	0.5			16	14		0.02		0.1	57.5
> 70 % > d.l. ?			*yes/no*	yes		yes	yes	yes			yes	yes		yes		yes	yes
n				*8*		*8*	*8*	*8*			*8*	*8*		*8*		*8*	*8*
Irish Sea: Slaney - 1997	4034.9	3297.0	Median	<0.05		1.2	0.7	0.006			0.06	4.7		0.048		0.1	5.2
Minimum				<0.05		0.6	<0.05	<0.001			<0.01	2.9		0.023		0.10	0.8
Maximum				0.1		3.9	3.3	0.023			0.2	5.4		0.1		0.6	52
> 70 % > d.l. ?			*yes/no*	no		yes	yes	yes			yes	yes		yes		yes	yes
n				*8*		*8*	*8*	*8*			*8*	*8*		*8*		*8*	*8*
Celtic Sea: Barrow - 1997	3466.4	3234.8	Median	<0.05		1.2	1.2	0.01			0.05	4.8		0.09		0.15	6.3
Minimum				<0.05		0.9	<0.5	0.00			0.017	2.1		0.06		0.09	1.4
Maximum				0.2		4	3.1	0.02			0.2	5.9		0.2		0.7	87
> 70 % > d.l. ?			*yes/no*	no		yes	yes	yes			yes	yes		yes		yes	yes
n				*8*		*8*	*8*	*8*			*8*	*8*		*8*		*8*	*8*
Celtic Sea: Nore - 1997	3883.7	3742.0	Median	<0.05		1.4	1	0.01			0.05	3.9		0.09		0.153	7.1
Minimum				<0.05		0.6	<0.5	<0.001			0.01	2.1		0.05		0.096	2.2
Maximum				0.2		5.9	7.2	0.03			0.2	4.9		0.2		1.2	123
> 70 % > d.l. ?			*yes/no*	no		yes	yes	yes			yes	yes		yes		yes	yes
n				*8*		*8*	*8*	*8*			*8*	*8*		*8*		*8*	*8*

Table 7. Contaminant concentrations of Irish rivers discharging to the maritime area (continued)

Main riverine inputs				Contaminant Concentrations --->														
Discharge area	Flow rate [1000 m³/d] annual	LTA	Mean or median?	Cd [µg/l]	Hg [µg/l]	Cu [µg/l]	Pb [µg/l]	Zn [mg/l]	g-HCH [ng/l]	PCBs (1) [ng/l]	NH4-N [mg/l]	NO3-N [mg/l]	TKN [mg/l]	PO4-P [mg/l]	Total N [mg/l]	Total P [mg/l]	SPM(2) [mg/l]
Celtic Sea: Suir - 1997	6695.1	5855.3															
			Median	<0.05		1.1	0.7	0.01			0.1	3.1		0.053		0.122	5.5
Minimum				<0.05		0.6	<0.5	0.002			<0.01	0.98		0.038		0.1	1.4
Maximum				0.19		8.1	5.9	0.04			0.154	4		0.1		0.4	73
> 70 % > d.l. ?			*yes/no*	no		yes	yes	yes			yes	yes		yes		yes	yes
n				*8*		*8*	*8*	*8*			*8*	*8*		*8*		*8*	*8*
Celtic Sea: Blackwater - 1997	7403.6	7302.5															
			Median	0.06		1.9	2.9	0.01			0.09	3.1		0.071		0.14	12
Minimum				<0.05		0.8	<0.5	0.003			0.03	1.9		0.05		0.06	2.2
Maximum				0.12		4.9	21.5	0.022			0.3	4.5		0.1		0.4	16.2
> 70 % > d.l. ?			*yes/no*	yes		yes	yes	yes			yes	yes		yes		yes	yes
n				*5*		*5*	*5*	*5*			*5*	*5*		*5*		*5*	*5*
Celtic Sea: Lee - 1997	3342.0	3405.0															
			Median	<0.05		1.6	<0.5	0.01			0.04	2.9		0.04		0.1	3.4
Minimum				<0.05		<0.5	<0.5	0.002			0.04	2.7		0.032		0.04	0.4
Maximum				0.07		3.6	3.6	0.018			0.1	4.2		0.06		0.1	14
> 70 % > d.l. ?			*yes/no*	no		yes	no	yes			yes	yes		yes		yes	yes
n				*5*		*5*	*5*	*5*			*5*	*5*		*5*		*5*	*5*
Celtic Sea: Bandon - 1997	1766.9	1808.4															
			Median	<0.05		1.9	1.6	0.009			0.04	4.1		0.05		0.11	3.4
Minimum				<0.05		0.8	<0.5	0.002			0.018	3.2		0.04		0.06	0.4
Maximum				0.09		3	14	0.04			0.2	5.3		0.08		0.2	14
> 70 % > d.l. ?			*yes/no*	no		yes	yes	yes			yes	yes		yes		yes	yes
n				*5*		*5*	*5*	*5*			*5*	*5*		*5*		*5*	*5*
Celtic Sea: Deel - 1997	624.7	622.1															
			Median	0.17		3.6	3.8	0.01			0.3	2.3		0.3		0.5	22
Minimum				<0.05		2	1.3	0.004			0.027	1.9		0.116		0.13	2.6
Maximum				0.4		10.3	7.4	0.03			0.7	3.8		0.6		1.25	88
> 70 % > d.l. ?			*yes/no*	yes		yes	yes	yes			yes	yes		yes		yes	yes
n				*5*		*5*	*5*	*5*			*5*	*5*		*5*		*5*	*5*
Celtic Sea: Maigue - 1997	1505.1	1397.1															
			Median	0.05		1.9	2.7	0.02			0.1	3.0		0.2		0.3	6
Minimum				<0.05		1.4	0.9	0.004			0.04	1.8		0.1		0.1	3
Maximum				0.18		6.8	3.8	0.04			0.5	3.5		0.5		1.72	63
> 70 % > d.l. ?			*yes/no*	no		yes	yes	yes			yes	yes		yes		yes	yes
n				*5*		*5*	*5*	*5*			*5*	*5*		*5*		*5*	*5*

Table 7. Contaminant concentrations of Irish rivers discharging to the maritime area (continued)

Main riverine inputs				Contaminant Concentrations --->														
Discharge area	Flow rate [1000 m³/d] annual	LTA	Mean or median?	Cd [µg/l]	Hg [µg/l]	Cu [µg/l]	Pb [µg/l]	Zn [mg/l]	g-HCH [ng/l]	PCBs (1) [ng/l]	NH4-N [mg/l]	NO3-N [mg/l]	TKN [mg/l]	PO4-P [mg/l]	Total N [mg/l]	Total P [mg/l]	SPM(2) [mg/l]
Celtic Sea: Shannon** - 1997 (old channel)	3699.6	4655.2															
			Median	<0.05		1.9	2.3	0.01			0.07	1.5		0.07		0.15	7.8
Minimum				<0.05		1.1	1	0.003			0.028	1.2		0.05		0.07	2
Maximum				0.1		4.4	9.3	0.033			0.2	2.0		0.1		0.6	45.6
> 70 % > d.l. ?			*yes/no*	no		yes	yes	yes			yes	yes		yes		yes	yes
n				*5*		*5*	*5*	*5*			*5*	*5*		*5*		*5*	*5*
Celtic Sea: Shannon** - 1997 (tailrace)	13741.9	13176.0 NA															
			Median	<0.05		1.3	1	0.004			0.01	1.8		0.03		0.07	2.6
Minimum				<0.05		0.8	<0.5	0.002			<0.01	1.1		0.023		0.03	0.6
Maximum				0.08		2	4.6	0.02			0.05	1.8		0.04		0.05	18
> 70 % > d.l. ?			*yes/no*	no		yes	yes	yes			no	yes		yes		yes	yes
n				*5*		*5*	*5*	*5*			*5*	*5*		*5*		*5*	*5*
Celtic Sea: Fergus - 1997	1451.5	1657.2															
			Median	<0.05		1.7	1.1	0.004			0.08	1.3		0.04		0.09	3.5
Minimum				<0.05		1	<0.5	<0.5			0.02	0.8		0.03		0.05	0.4
Maximum				0.7		1.3	2	0.01			0.1	1.5		0.1		0.3	10
> 70 % > d.l. ?			*yes/no*	no		yes	yes	yes			yes	yes		yes		yes	yes
n				*5*		*5*	*5*	*5*			*5*	*5*		*5*		*5*	*5*
Atlantic: Corrib - 1997	7356.1	8447.3															
			Median	<0.05		0.6	0.9	0.005			0.01	0.9		0.008		0.04	3.5
Minimum				<0.05		<0.5	<0.5	<0.001			<0.01	0.69		0.006		0.02	0.8
Maximum				<0.05		10.1	8.5	0.016			0.06	1.3		0.01		0.226	7
> 70 % > d.l. ?			*yes/no*	no		no	yes	yes			no	yes		yes		yes	yes
n				*4*		*4*	*4*	*4*			*4*	*4*		*4*		*4*	*4*
Atlantic: Moy - 1997	4203.4	5054.4															
			Median	<0.05		1.1	1.2	0.01			0.03	0.8		0.02		0.10	5.9
Minimum				<0.05		0.6	<0.5	<0.001			0.03	0.8		0.009		0.048	2
Maximum				0.12		2	5.6	0.03			0.06	0.9		0.03		0.3	48
> 70 % > d.l. ?			*yes/no*	no		yes	yes	yes			yes	yes		yes		yes	yes
n				*4*		*4*	*4*	*4*			*4*	*4*		*4*		*4*	*4*
Atlantic : Erne - 1997	7215.3	8719.5		<0.05		2.1	0.5	0.005			<0.010	0.9		0.04		0.077	2.6
			Median														
Minimum				<0.05		1.6	<0.5	<0.001			<0.010	0.7		0.04		0.05	0.6
Maximum				0.06		4.3	2.6	0.027			0.01	1.42		0.04		0.27	5
> 70 % > d.l. ?			*yes/no*	no		yes	no	yes			no	yes		yes		yes	yes
n				*4*		*4*	*4*	*4*			*4*	*4*		*4*		*4*	*4*

LTA: Long-term average flow
NI: No information
(1) IUPAC Nos 28, 52, 101, 118, 153, 138, 180
(2) Organic-N (Kjeldahl)
(3) Suspended particulate matter

NB: ** The bulk of the flow of the river Shannon is diverted to a hydroelectricity generating facility a short distance above the estuary. Sampling was carried out in the Old Channel below the diversion point and in the tailrace of the power station. Loads were estimated separately for each branch and combined to give the total load for the river.

Table 8. Detection limits for contaminant concentrations of Irish inputs to the maritime area

Riverine			Detection limits for contaminant concentrations -->												
Sampling point	Type (3)		Cd [µg/l]	Hg [µg/l]	Cu [µg/l]	Pb [µg/l]	Zn [µg/l]	g-HCH [ng/l]	PCBs (1) [ng/l]	NH4-N [mg/l]	NO3-N [mg/l]	PO4-P [mg/l]	Total N [mg/l]	Total P [mg/l]	SPM(2) [mg/l]
	R		0.05	0.15	0.5	0.5	0.5			0.01	0.01	0.005	0.02	0.005	2

 # specify here to which part of the inputs this table relates

(1) IUPAC Nos 28, 52, 101, 118, 153, 138, 180; make separate list if needed.
(2) Suspended particulate matter
(3) S: sewage; I: Industrial discharges; R: riverine inputs (main and tributary)
ND: Not detected

Annex 6

THE NETHERLANDS

Annual report on riverine inputs and direct discharges to Convention waters during the year 1997 by the Netherlands

Annual report on riverine inputs and direct discharges to Convention waters during the year 1997 by the Netherlands

Name, address and contact numbers of reporting authority to which any further enquiry should be addressed:

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A. General information

Table 1: General overview of river systems (for riverine inputs) and direct discharge areas (for poldereffluents/canals) included in the data report

Country: The Netherlands	
Name of river, subarea and discharge area	**Nature of the receiving water**
Spuikanaal Bath, Kanaal Gent-Terneuzen, other polder effluents Westerschelde (Wielingen included)	Western Scheldt Estuary
Krammersluizen (Oosterschelde/Zoommeer), other polder effluents Oosterschelde	Southern Delta Coast
Haringvliet	Northern Delta Coast
Nieuwe Waterweg (Maassluis)	Northern Delta Coast
Oude Rijn (gemaal Katwijk) and other polder effluents Closed Holland Coast (gemalen Scheveningen and Vlotwatering)	Closed Holland Coast
Noordzeekanaal	Closed Holland Coast
Polderеffluents/Canals Waddensea (De Helsdeur, Spuisluis Oostoever, Harlingen, Lauwersmeer, Roptazijl, Zwarte Haan)	Waddensea
IJsselmeer	Waddensea
Polderеffluents/Canals Ems-Dollard (Eemskanaal, Nieuwe Statenzijl, Termunsterzijl, Damsterdiep, Duurswold)	Ems Dollard estuary

B. Total riverine inputs and direct discharges for the year 1997

B.1 Comments on the Total Riverine Inputs and Direct Discharges as presented in Table 4a:
** Riverine Input data: including loads from countries upstream*

C. Direct discharges for the year 1997

Sewage Effluents (Table 5a.)

C.1 Describe the methods of measurement and calculation used, including information on the number of samples and the concentration upon which the measurement is based (ref.: Section 6 of the Principles), including for those under voluntary reporting:

** Method: Product of annual flow and flow-weighted concentration.*
** Sewage effluents concern 1996 figures.*

C.2 Describe the determinands, other than those specified in paragraph 2.1 of the Principles, that are included in the current monitoring programme and which may be relevant for the Comprehensive Study on Riverine Inputs and Direct Discharges (voluntary reporting):

[none]

Industrial Effluents (Table 5b.)

C.3 Describe the methods of measurement and calculation used, including information on the number of samples and the concentration upon which the measurement is based (ref.: Section 6 of the Principles), including for those under voluntary reporting:

** Method: see paragraph C.1*

C.4 Give any other relevant information (e.g. proportion of substance discharged as insoluble material):

[none]

C.5 Give any available information on other discharges directly to Convention Waters - through e.g. urban run-off and stormwater overflows - that are not covered by the data in tables 5a. and 5b.:

[none]

C.6 Describe the determinands, other than those specified in paragraph 2.1 of the Principles, that are included in the current monitoring programme and which may be relevant for the Comprehensive Study on Riverine Inputs and Direct Discharges (voluntary reporting):

[none]

D. Riverine inputs for the year 1997

Main Rivers (Tables 6a. and 7a.)

D.1 Describe the methods of measurement and calculation used, including information on the number of samples and the concentration (Table 7a.) upon which the measurement is based (ref.: Section 5 of the Principles), including for those under voluntary reporting:

** Method: see paragraph 5.11 of the Principles*

D.2 Give any other relevant information (e.g. proportion of substance transported by the river in particulate form):

** Loads from countries upstream are included*

D.3 Describe the determinands, other than those specified in paragraph 2.1 of the Principles, that are included in the current monitoring programme and which may be relevant for the Comprehensive Study on Riverine Inputs and Direct Discharges (voluntary reporting):

[none]

Tributary Rivers (Tables 6b. and 7b.)

D.4 Describe the methods of measurement and calculation used, including information on the number of samples and the concentration (Table 7b.) upon which the measurement is based (ref.: Section 5 of the Principles):

** Method: see paragraph 5.11 of the principles*

D.5 Give any other relevant information (e.g. proportion of substance transported by the river in particulate form):

[none]

D.6 Describe the determinands, other than those specified in paragraph 2.1 of the Principles, that are included in the current monitoring programme and which may be relevant for the Comprehensive Study on Riverine Inputs and Direct Discharges (voluntary reporting):

[none]

D.7 Give any available information on other inputs - through e.g. polder effluents or from coastal areas - that are not covered by data in tables 6a. and 6b.:

[none]

E. Limits of detection

E.1 Information concerning limits of detection should be presented in Table 8 which includes different columns for rivers/tributaries, sewage effluents and industrial effluents. Any important comments may be presented here.

It is also important to include detection limits for measurements in suspended materials. The Netherlands have included this information in table 8 (some practical difficulties appeared with the format of table 8)

F. National Comment

F.1 Give a general summary of the main results as presented in the tables 5, 6 and 7 and comment, as appropriate, on these results.

** The inputs of contaminants in the year 1997 are of the same magnitude as in 1996. Approximately 3 percent of the total inputs (direct discharges and riverine inputs) to the Convention waters originated from direct discharges. The main riverine inputs (Haringvlietsluizen, Maassluis, Noordzeekanaal and IJsselmeer) contribute for more than 90 percent to the total riverine inputs.*

F.2 Indicate any significant change in inputs and concentrations in comparison to previous years. Comment on these changes as appropriate.

** The flow rate of industrial effluents discharges into the Ems-Dollard Estuary has increased from 12,6*1000 m^3/d (1996) to 2700*1000 m^3/d (1997), due to the availability as from 1997 of data of cooling water discharges of the Eemscentrale (power plant). This change in flow rate, however, did not result in significant changes in inputs and concentrations.*

F.3 Indicate and explain, if appropriate:

- where and why the applied procedures do not comply with agreed procedures
- significant changes in monitoring sites, important for comparison of the data before and after the date of change
- incomplete or distorted data

** In 1997, the following changes in monitoring sites at the Wadden Coast are made:*

- Roptazijl: new monitoring site
- Zwarte Haan: new monitoring site
- Krassekreet: taken out of service

Significant changes in tributary riverine inputs to the Wadden Coast (total) are not to be expected.

Table 5a. Direct discharges to the maritime area in 1997 by the Netherland

Sewage effluents (3)			Quantities --->												
Discharge area	Nature of receiving water	Flow rate [1000 m3/d]	Cd [t]	Hg [t]	Cu [t]	Pb [t]	Zn [t]	g-HCH [kg]	PCBs (1) [kg]	NH4-N [kt]	NO3-N [kt]	PO4-P [kt]	Total N [kt]	Total P [kt]	SPM(2) [kt]
Westerschelde	Western Scheldt Estuary	150	0.01	0.01	0.3	0.09	2.7	NI	NI	0.5	0.7	NI	1.3	0.09	0.7
Oosterschelde/Zoommeer	Southern Delta Coast	7	0.0006	0.001	0.02	0.008	0.1	NI	NI	0.002	0.03	NI	0.04	0.01	0.05
Houtrust	Closed Holland Coast	220	0.02	0.004	0.5	0.7	8.2	NI	NI	2.8	0.5	NI	3.8	0.2	4.3
Ems/Dollard	Ems Dollard Estuary	5	0.00	0.00	0.003	0.001	0.04	NI	NI	0.008	0.01	NI	0.03	0.004	0.02
Total:		380	0.03	0.02	0.8	0.8	11	NI	NI	3.3	1.2	NI	5.2	0.3	5.1

Table 5b. Direct discharges to the maritime area in 1997 by the Netherland

Industrial effluents			Quantities --->												
Discharge area	Nature of receiving water	Flow rate [1000 m3/d]	Cd [t]	Hg [t]	Cu [t]	Pb [t]	Zn [t]	g-HCH [kg]	PCBs (1) [kg]	NH4-N [kt]	NO3-N [kt]	PO4-P [kt]	Total N [kt]	Total P [kt]	SPM(2) [kt]
Westerschelde	Western Scheldt Estuary	190	0.2	0.005	0.6	0.5	4.5	0.0	0.0	NI (4)	0.1	NI	0.3	0.2	0.4
Buitenhaven IJmuiden (3)	Closed Holland Coast	NI	0	0.06	0.09	1.6	3.4	0.0	0.0	NI (4)	0.04	NI	0.6	0.05	3.2
Ems Dollard	Ems Dollard Estuary	2700	0.001	0.00005	0.9	0.05	9.4	0.0	0.0	NI (4)	0.05	NI	0.3	0.01	0.8
Waddensea	Waddensea	6	0	0.0003	0	0	0.09	0.0	0.0	NI (4)	0.03	NI	0.05	0.03	0.08
Total:		2900	0.2	0.07	1.6	2.2	17	0.0	0.0	NI (4)	0.2	NI	1.3	0.3	4.5

NI: No information
(1) IUPAC Nos 28, 52, 101, 118, 153, 138, 180
(2) Suspended particulate matter
(3) Concerns 1996 figures
(4) Insufficient information

Table 5c. Direct discharges to the maritime area in 1997 by the Netherlands

Total direct discharges	Quantities --->												
Discharge area	Cd [t]	Hg [t]	Cu [t]	Pb [t]	Zn [t]	g-HCH [kg]	PCBs (1) [kg]	NH4-N [kt]	NO3-N [kt]	PO4-P [kt]	Total N [kt]	Total P [kt]	SPM(2) [kt]
Western Scheldt Estuary	0.2	0.02	0.9	0.6	7.2	0.0	0.0	0.5	0.8	NI	1.6	0.3	1.1
Southern Delta Coast	0.001	0.001	0.02	0.01	0.1	0.0	0.0	0.002	0.03	NI	0.04	0.01	0.05
Closed Holland Coast	0.02	0.06	0.6	2.3	12	0.0	0.0	2.8	0.5	NI	4.4	0.3	7.5
Wadden Coast	0	0.0003	0.003	0.001	0.1	0.0	0.0	0	0.04	NI	0.08	0.03	0.1
Ems Dollard Estuary	0.001	0.00005	0.9	0.05	9.4	0.0	0.0	0.008	0.05	NI	0.3	0.01	0.8
Total:	0.2	0.08	2.4	2.9	28	0.0 (5)	0.0 (5)	3,3 (6)	1.5	NI	6.4	0.6	9.6

NI: No information
(1) IUPAC Nos 28, 52, 101, 118, 153, 138, 180
(2) Suspended particulate matter
(5) Industrial effluents only
(6) Sewage effluents only

Table 6a. Riverine inputs to the maritime area in 1997 by the Netherlanc

Main riverine inputs			Quantities --->												
Discharge point or area	Flow rate [Ml/d] 1997	LTA	Cd [t]	Hg [t]	Cu [t]	Pb [t]	Zn [t]	g-HCH [kg]	PCBs (1) [kg]	NH4-N [kt]	NO3NO2-N [kt]	PO4-P [kt]	Total N [kt]	Total P [kt]	SPM(2) [kt]
Haringvlietsluizen	32800	67800	0.6 0.6	0.3 0.3	37 37	25 25	92 140	67 67	19 19	1.7 1.7	39 39	1.2 1.2	45 45	2.0 2.0	140 140
Maassluis	116300	115300	2.2 2.4	1.9 1.9	190 190	170 170	920 920	180 180	110 110	6.8 6.8	140 140	5.4 5.4	170 170	11 11	1700 1700
Total Northern Delta Coast			2.8 3.0	2.2 2.2	230 230	200 200	1000 1100	250 250	130 130	8.5 8.5	180 180	6.6 6.6	220 220	13 13	1800 1800
Noordzeekanaal	6100	8200	0.2 0.2	0.03 0.03	11 11	3.2 3.3	6.3 24	6.8 7.0	1.6 1.6	0.5 0.5	5.6 5.6	0.5 0.5	8.0 8.0	0.8 0.8	19 19
IJsselmeer	32600	43200	0.6 0.6	0.2 0.2	29 29	21 21	120 160	36 38	7.2 7.8	0.4 0.4	20 20	0.2 0.2	37 38	1.6 1.6	360 360
Total*	**187800**	**0** **234500**	**3.6** **3.8**	**2.4** **2.4**	**270** **270**	**220** **220**	**1100** **1200**	**290** **300**	**140** **140**	**9.4** **9.4**	**210** **210**	**7.3** **7.3**	**270** **270**	**15** **15**	**2200** **2200**

(1) IUPAC Nos 28, 52, 101, 118, 153, 138, 180
(2) Suspended particulate matter
*: Exclusive of River Scheldt which is reported by Belgium

Table 6b. Riverine inputs to the maritime area in 1997 by the Netherlanc

Tributary riverine inputs (incl. polder effluents)			Quantities --->												
Discharge area	Nature of receiving water	Flow rate [1000 m3/d]	Cd [t]	Hg [t]	Cu [t]	Pb [t]	Zn [t]	g-HCH [kg]	PCBs (1) [kg]	NH4-N [kt]	NO3-N [kt]	PO4-P [kt]	Total N [kt]	Total P [kt]	SPM(2) [kt]
Kanaal Gent-Terneuzen (3)	Western Scheldt Estuary	1500	0.01	0.01	2.0	0.9	29	NI	NI	3.2	2.6	0.7	6.4	0.8	3.4
Spuikanaal Bath (3)	Western Scheldt Estuary	360	0.006	0.0006	0.4	0.2	3.3	1.1	NI	0.02	0.2	0.01	0.3	0.02	0.5
Polder effluents, incl. Wieling	Western Scheldt Estuary	620	0.03	NI	0.8	NI	3.6	NI	NI	0.8	1.0	0.2	2.1	0.2	6.8
Total Western Scheldt Estuary:		2500	0.05	0.01	3.2	1.1	36	1.1	NI	4.0	3.8	0.9	8.8	1.0	11
Krammersluizen (3)	Southern Delta Coast	700	0.01	0.001	0.8	0.3	3.4	NI	NI	0.03	0.5	0.05	0.7	0.04	1.1
Polder effluents Oosterschelde	Southern Delta Coast	200	0.009	NI	0.3	NI	1.2	NI	NI	0.3	0.4	0.05	0.8	0.06	2.3
Total Southern Delta Coast:		900	0.02	0.001	1.1	0.3	4.6	NI	NI	0.3	0.9	0.1	1.5	0.1	3.4
Gemaal Vlotwatering	Closed Holland Coast	14	NI	NI	NI	NI	NI	0.04 0.04	0 0.3	NI	0.03 0.03	0.004 0.004	0.04 0.04	0.005 0.005	0.1 0.1
Gemaal Scheveningen	Closed Holland Coast	80	0.002 0.002	0 0.003	0.2 0.2	0.2 0.2	1.1 1.1	0 0.1	0 2.0	0.008 0.008	0.1 0.1	0.02 0.02	0.1 0.1	0.02 0.02	0.4 0.4
Gemaal Katwijk	Closed Holland Coast	390	0 0.03	8.E-04 0.003	0.7 0.7	0.01 0.3	1.9 1.9	1.0 1.0	NI	0.1 0.1	0.5 0.5	0.08 0.08	0.8 0.8	0.1 0.1	0.8 0.8
Total Closed Holland Coast:		480	0.002 0.03	0.0008 0.006	0.9 0.9	0.2 0.5	3.0 3.0	1.0 1.1	0 2.3	0.1 0.1	0.6 0.6	0.1 0.1	0.9 0.9	0.1 0.1	1.3 1.3
De Helsdeur	Wadden Coast	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI
Spuisluis Oostoever	Wadden Coast	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI
Lauwersmeer	Wadden Coast	2500	0 0.1	0.03 0.04	3.0 3.0	1.0 1.3	1.8 7.5	1.1 3.9	0 42	0.2 0.2	1.7 1.7	0.2 0.2	4.3 4.3	0.3 0.3	10 16
Harlingen	Wadden Coast	390	0 0.02	0.002 0.004	0.6 0.6	0 0.3	1.1 1.8	0.3 0.3	NI	0.05 0.08	0.4 0.4	0.04 0.04	0.8 0.8	0.06 0.06	3 3
Zwarte Haan	Wadden Coast	41	0 0.002	0 0.0004	0.03 0.03	0 0.03	0.08 0.2	0.05 0.05	NI	0.006 0.009	0.02 0.02	0.006 0.006	0.06 0.06	0.009 0.009	0.3 0.3
Roptazijl	Wadden Coast	41	0 0.002	0 0.0005	0.02 0.02	0 0.03	0 0.2	0.03 0.03	NI	0.004 0.009	0.02 0.02	0.006 0.006	0.06 0.06	0.01 0.01	0.4 0.4
Total Wadden Coast:		3000	0 0.1	0.03 0.04	3.7 3.7	1 1.7	3 9.7	1.5 4.3	0 42	0.3 0.3	2.1 2.1	0.3 0.3	5.2 5.2	0.4 0.4	14 20
Duurswold	Ems Dollard Estuary	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI
Eemskanaal	Ems Dollard Estuary	470	0 0.02	0.02 0.02	0.6 0.6	0.2 0.3	2.5 2.5	0.5 0.8	0 7.9	0.2 0.2	0.6 0.6	0.02 0.02	1.2 1.2	0.03 0.03	1.8 2.2
Nieuwe Statenzijl	Ems Dollard Estuary	360	0 0.01	0.003 0.005	0.3 0.3	0.2 0.2	0.2 0.7	0.4 0.7	0 6.0	0.1 0.1	0.3 0.3	0.004 0.004	0.8 0.8	0.03 0.03	2.4 2.4
Total Ems-Dollard Estuary:		830	0 0.03	0.02 0.03	0.9 0.9	0.4 0.5	2.7 3.2	0.9 1.5	0 14	0.3 0.3	0.9 0.9	0.02 0.02	2.0 2.0	0.06 0.06	4.2 4.6
Grand total:		7700	0.07 0.2	0.06 0.09	9.8 9.8	3.0 4.1	49 57	4.5 8.0	0 58	5.0 5.0	8.3 8.3	1.4 1.4	18 18	1.7 1.7	34 40

NI: No information

(1) IUPAC Nos 28, 52, 101, 118, 153, 138, 180

(2) Suspended particulate matter

(3) Concerns 1996 figures

Table 6c. Riverine inputs to the maritime area in 1997 by the Netherlanc

Total riverine inputs (incl. Polder effluents)	Quantities --->												
Discharge area	Cd [t]	Hg [t]	Cu [t]	Pb [t]	Zn [t]	g-HCH [kg]	PCBs (1) [kg]	NH4-N [kt]	NO3-N [kt]	PO4-P [kt]	Total N [kt]	Total P [kt]	SPM(2) [kt]
Western Scheldt Estuary	0.04	0.1	3.2	1.1	36	1.1	NI	4.0	3.8	0.9	8.8	1.0	11
Southern Delta Coast	0.02	0.001	1.1	0.3	4.6	NI	NI	0.3	0.9	0.1	1.5	0.1	3.4
Northern Delta Coast	2.8	2.2	230	200	1000	250	130	8.5	180	6.6	220	13	1800
	3.0	2.2	230	200	1100	250	130	8.5	180	6.6	220	13	1800
Closed Holland Coast	0.2	0.03	12	3.4	9.3	7.8	1.6	0.6	6.1	0.6	8.9	0.9	20
	0.2	0.04	12	3.8	27	8.1	3.9	0.6	6.1	0.6	8.9	0.9	20
Wadden Coast	0.6	0.2	33	22	120	38	7.2	0.7	22	0.5	42	2.0	370
	0.7	0.2	33	23	170	42	50	0.7	22	0.5	43	2.0	380
Ems Dollard Estuary	0	0.02	0.9	0.4	2.7	0.9	0	0.3	0.9	0.02	2.0	0.06	4.2
	0.03	0.03	0.9	0.5	3.2	1.5	14	0.3	0.9	0.02	2.0	0.06	4.6
Total:	**3.7**	**2.6**	**280**	**230**	**1200**	**300**	**140**	**14**	**210**	**8.7**	**280**	**17**	**2210**
	4.0	**2.6**	**280**	**230**	**1300**	**300**	**200**	**14**	**210**	**8.7**	**280**	**17**	**2220**

NI: No information
(1) IUPAC Nos 28, 52, 101, 118, 153, 138, 180
(2) Suspended particulate matter

Table 7. Contaminant concentrations of rivers in the Netherlands discharging to the maritime area

				Contaminant concentrations -->												
Year	Flow rate [1000 m³/d]		Mean or	Cd	Hg	Cu	Pb	Zn	g-HCH	PCBs (1)	NH4-N	NO2NO3-N	PO4-P	Total N	Total P	SPM(2)
	annual	LTA	median?	[µg/l]	[µg/l]	[µg/l]	[µg/l]	[µg/l]	[µg/l]	[µg/kg]	[mg/l]	[mg/l]	[mg/l]	[mg/l]	[mg/l]	[mg/l]
Maassluis																
1997	116300	115300	Median	0.01	0.03	3.6	2.4	16	0.004	69	0.1	2.9	0.1	3.9	0.2	26
			st.dev.		0.03	2.4	3.4		0.002	17	0.1	0.8	0.03	1.0	0.07	31
			Minimum	<0,01	0.01	1.7	0.1	<10	0.002	44	0.04	1.8	0.06	2.4	0.2	11
			Maximum	0.24	0.1	14	16	69	0.01	123	0.5	5.0	0.2	6.2	0.5	170
> 70 % > d.l. ?			yes/no	no	yes	yes	yes	no	yes	yes	yes	yes	yes	yes	yes	yes
			n	***24***	***25***	***24***	***24***	***24***	***12***	***24***	***25***	***25***	***25***	***24***	***24***	***24***
Haringvlietsluis																
1997	32800	67800	Median	0.02	0.02	3	1.4	11	0.003	110	0.08	3.0	0.1	3.3	0.2	7.5
			st.dev.		0.009	0.3	0.9			22	0.1	0.8	0.04		0.04	
			Minimum	<0,01	<0,002	2.6	0.4	<10	<0,001	75	0.02	1.7	0.01	<2,6	0.08	<1
			Maximum	0.1	0.03	3.6	3.6	19	0.01	141	0.4	4.7	0.1	5.5	0.2	49
> 70 % > d.l. ?			yes/no	yes	yes	yes	yes	no	yes	yes	yes	yes	yes	yes	yes	yes
			n	***12***	***12***	***12***	***12***	***12***	***11***	***9***	***14***	***15***	***15***	***15***	***15***	***15***
IJsselmeer																
1997	32600	43200	Median	0.02	0.009	2.6	1.4	12	0.003	16	0.04	1.6	0.01	3.6	0.1	23
			st.dev.		0.02	1.1	1.6				0.01		0.009		0.08	24
			Minimum	<0,01	0.006	0.9	0.1	10	<0,001	<7	0.02	<0,01	0.004	<1,0	0.06	3.6
			Maximum	0.1	0.05	4.5	5.6	22	0.007	26	0.07	4.5	0.03	6.9	0.3	78
> 70 % > d.l. ?			yes/no	yes	yes	yes	yes	no	yes	no	yes	yes	yes	yes	yes	yes
			n	***9***	***10***	***10***	***10***	***10***	***10***	***8***	***13***	***13***	***13***	***13***	***13***	***12***
Noordzeekanaal																
1997	6100	8200	Median	0.07	0.011	5	0.2	10	0.003	73	0.2	2.6	0.2	3.7	0.3	9.5
			st.dev.			2.4				31	0.2	1.0	0.06	1.3	0.2	2.5
			Minimum	<0,01	<0,001	2.1	<0,1	<10	<0,001	16	0.05	1.3	0.1	1.8	0.2	3.5
			Maximum	0.5	0.02	11	9	16	0.009	124	0.8	4.3	0.3	6.2	0.8	12
> 70 % > d.l. ?			yes/no	no	yes	yes	no	no	yes	yes	yes	yes	yes	yes	yes	yes
			n	***12***	***11***	***11***	***10***	***12***	***12***	***8***	***14***	***14***	***13***	***14***	***13***	***12***

(1) IUPAC Nos 28, 52, 101, 118, 153, 138, 180
(2) Suspended particulate matte
ND: Not detected
st. dev.: Standard deviatior > 70 % > d.l. ?: yes if more than 70 % of concentration measurements were above the detection limit (cf. Table

Table 8. Detection limits for contaminant concentrations of inputs from The Netherlands to the maritime area General information for all sampling points/discharges, split up in water phase (for waste water and surface water) and suspended materials

#			Detection limits for contaminant concentrations -->												
Sampling point	Type (3)		Cd [µg/l]	Hg [µg/l]	Cu [µg/l]	Pb [µg/l]	Zn [µg/l]	g-HCH [ng/l]	PCBs (1) [ng/l]	NH4-N [mg/l]	NO3-N [mg/l]	PO4-P [mg/l]	Total N [mg/l]	Total P [mg/l]	SPM(2) [mg/l]
	S/I	WATER	1	0.1	1	30	1	50		0.1	0.01	0.01	0.1	0.2	10
	R	WATER	0.01	0.001	0.1	0.1	1	50		0.01	0.01	0.005	0.1	0.01	5
			Cd mg/kg	Hg microgr./kg	Cu mg/kg	Pb mg/kg	Zn mg/kg	g-HCH microgr./kg	PCBs (1) microgr./kg				Total N mg/kg	Total P mg/kg	
	S I R	SPM	0.1	0.01	0.1	0.1	1	1	1 (general) 2 (PCB138) 3 (PCB153)				0.01	100	

 # specify here to which part of the inputs this table relates

(1): IUPAC Nos 28,52,101,118,153,138,180
(2): SPM = suspended particulate matter
(3): S: Sewage; I: Industrial discharges; R: Riverine inputs (main and tributary)
ND: Not detected

Annex 7

NORWAY

Annual report on riverine inputs and direct discharges to Convention waters during the year 1997 by Norway

Table 5a.	Sewage effluents. Reported Maritime Area of the OSPAR Convention in 1997 by Norway.
Table 5b.	Industrial effluents. Reported Maritime Area of the OSPAR Convention in 1997 by Norway.
Table 6a.	Main riverine inputs. Reported Maritime Area of the OSPAR Convention in 1997 by Norway.
Table 6b.	Tributary inputs. Reported Maritime Area of the OSPAR Convention in 1997 by Norway.
Table 7.	Contaminant concentrations. Reported Maritime Area of the OSPAR Convention in 1997 by Norway.
Table 8.	Detection limits.
Table 9.	Catchment dependent information.

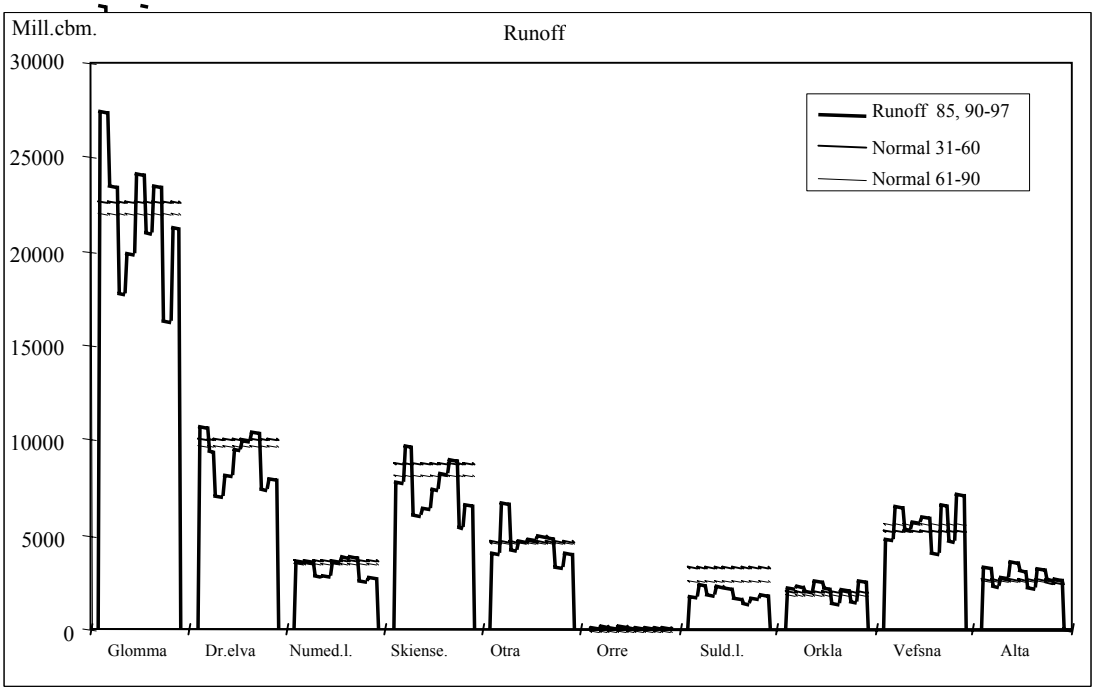
Note concerning the contribution from Finland to inputs to the OSPAR Convention area

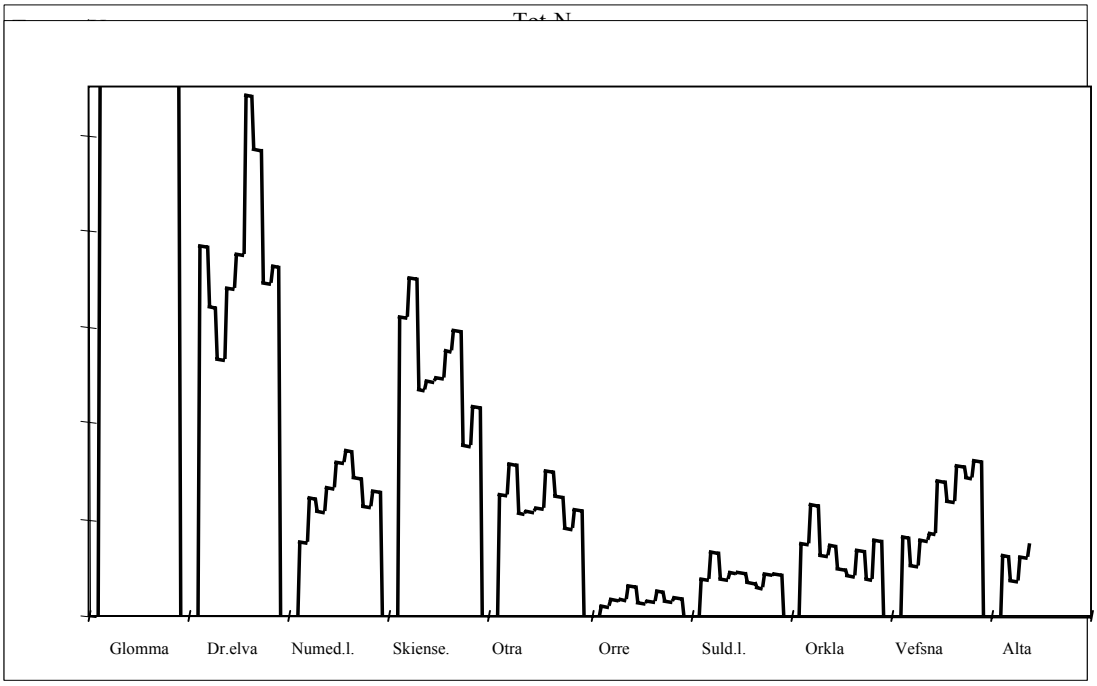
Finland has informed Contracting Parties about the state of the watercourses in the drainage area of the OSPAR maritime area (cf. INPUT(2) 98/4/Info.5). This concerns the rivers Tenojoki (draining through Norway), Näätämöjoki, Paatsjoki, the headwaters of the Tuulomajoki drainage area (including Luttojoki, Nuorttijoki) and the rivers Koutajoki and Vienen Kemi draining to the White Sea through Russia.

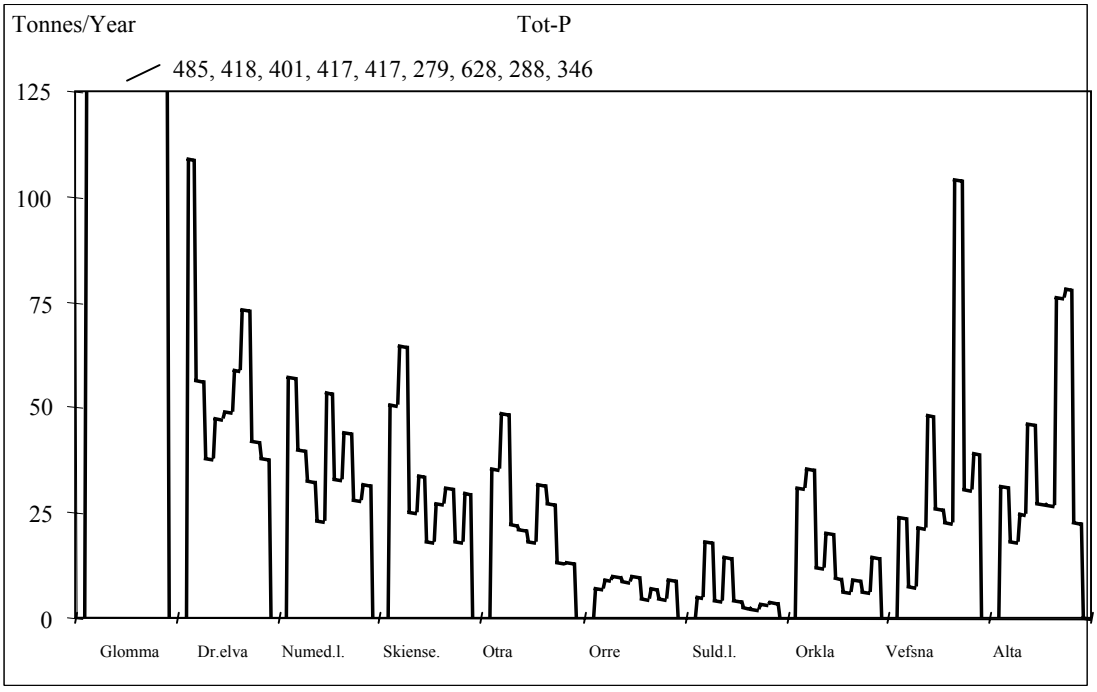
The inputs from Norwegian rivers (including contributions from the drainage area in Finland) are covered by the Norwegian RID monitoring, as is generally the case in with transboundary rivers under RID.

Data on inputs from rivers discharging from Russia into the OSPAR maritime area are not available in the OSPAR context (but cf. AMAP, 1998. AMAP Assessement Report: Arctic Pollution Issues. Arctic Monitoring and Assessment Programme (AMAP), Oslo, Norway, xii + 859 pp.)


72°
70°
68°
66°
64°
62°
60°
58°
6°
10°
14°
18°
22°
Alta–
elva
Vefsna
Orkla
Suldals–
lågen
Orre–
elva
Skiens–
elva
Otra
Drammens–
elva
Numedals–
lågen
Glomma
Main Rivers
Tributaries


Mill.cbm.
Runoff
30000
25000
20000
15000
10000
5000
0
Runoff 85, 90-97
Normal 31-60
Normal 61-90
Glomma
Dr.elva
Numed.l.
Skiense.
Otra
Orre
Suld.l.
Orkla
Vefsna
Alta


Glomma
Dr.elva
Numed.l.
Skiense.
Otra
Orre
Suld.l.
Orkla
Vefsna
Alta


Tonnes/Year
Tot-P
485, 418, 401, 417, 417, 279, 628, 288, 346
125
100
75
50
25
0
Glomma
Dr.elva
Numed.l.
Skiense.
Otra
Orre
Suld.l.
Orkla
Vefsna
Alta

Annual report on riverine inputs and direct discharges to Convention waters during the year 1997 by Norway

Name, address and contact numbers of reporting authority to which any further enquiry should be addressed:

Dag Rosland
Norwegian Pollution Control Authority
P.O.Box_8100, Dep.
N-0032 Oslo
Norway

A. General information

General overview of river systems (for riverine inputs) and direct discharge areas (for direct discharges) included in the data report

Country: Norway Name of river, subarea and discharge area[1]	Nature of the receiving water[2]	optional: national reference number	optional: map reference number
Skagerrak:			
(1) Glomma	Coastal water	002.Z	M711: 1913-1
(2) Drammenselva	"	012.Z	1914-4
(3) Numedalslågen	"	015.Z	1813-3
(4) Skienselva	"	016.Z	1713-3
(5) Otra	"	021.Z	1511-3
The remaining North Sea:			
(6) Orreelva	Coastal water	028.4Z	M711: 1212-3
(7) Suldalslågen	"	036.Z	1313-4
The Norwegian Sea:			
(8) Orkla	Coastal water	121.Z	M711: 1521-2
(9) Vefsna	"	151.Z	1926-3
The Barents Sea:			
(10) Alta	Coastal water	212.Z	M711: 1834-1

[1] i.e. name of estuary or length of coastline
[2] i.e. estuary or coastal water; if an estuary, state the tidal range and the daily flushing volume

B. Total riverine inputs and direct discharges for the year 1997

B.1 Comments on the Total Riverine Inputs and Direct Discharges for the year 1997

In this report the results (1997) are given for riverine inputs of 10 main rivers and 145 tributaries. Thus the active monitoring programme covers drainage from 75 per cent of the main land areas. For discharges entering directly into marine recipients, i.e. sewage and industrial effluents, estimates are based on data from effluent control programmes. Area runoff of Total phosphorus, Total nitrogen, phosphates, nitrates and ammonia from these coastal zones are estimated by use of area specific runoff coefficients.
The greatest emphasis with regard to accuracy has been given to the input estimate of the Skagerrak region, as this is considered the most susceptible part of the North Sea. The Skagerrak reception of Norways total loads are 24 per cent of the phosphorus and 35 per cent of the nitrogen yield. In this region where 90 per

cent of the area is river- monitored, about 64 per cent of the P- and 73 per cent of the N- loads, are found in the riverine inputs.

According to the results of the 1997 investigation total annual nutrient loads to coastal waters from landbased sources in Norway are approximately 3600 tonnes of phosphorus and 101.600 tonnes of nitrogen. Respectively 40 and 59 per cent of the grand total inputs of phosphorus and nitrogen are monitored in the main and tributary rivers. Riverine inputs of metals and micropollutants are low. Some concentrations found for Cd and also a few Pb-findings are lower than the detection limit requested from PARCOM. Therefore, two quantities have been estimated: one assuming that the true concentration is zero and the other assuming that the true concentration is the limit of detection. This provides maximum and minimum concentrations between which lies the true estimate. When evaluating inputs these data provide a basis for upper and lower estimates.

Inputs of cadmium are thus measured/calculated to be between 4.8 and 5.7 tonnes, mercury between 389 and 489 kg. The "below detection limit problem" also applies for the inputs of PCBs which are measured to be between 0.04 and 45 kg. The pesticide lindane was found in all analyses, but in small amounts. Assumably, lindane contamination in Norwegian rivers is mostly due to long range air pollution. Total load is estimated to about 80 kg. The largest share of heavy metals comprise copper and zinc, with input estimates of 326 and 902 tonnes, of which 81 and 85 % respectively, is river-monitored.

Retention of nutrients and micropollutants in the many treshold fjords of Norway is not included in the above given input figures. Estimates of retention of these substances would presumedly reduce the actual input to open marine waters.

C. Direct discharges for the year 1997

As the methodology for assessing direct discharges to marine waters is outlined in the 1990-Report (Holtan et al., 1991), and the same procedure is adopted for 1997, we refer to the above mentioned document for further information on this matter.

Source: Holtan, G., D. Berge, H. Holtan and T. Hopen, 1991: Paris Convention. Annual report on direct and riverine inputs to Norwegian coastal waters during the year 1990: A: Principles, results and discussions. SFT-report 452A/91. NIVA-report 0-90001/Serial No.: 2582.

Sewage Effluents (Table 5a.)

C.1 Describe the methods of measurement and calculation used, including information on the number of samples and the concentration upon which the measurement is based (ref.: Section 6 of the Principles), including for those under voluntary reporting:

Waste water treatment plants/sewage effluents

The Central Bureau of Statistics (SSB) and SFT have jointly initiated annual registration of data from all waste water treatment plants in the country with a capacity of more than 50 population units (PU). The data are updated each year by the County Environmental Agencies. The data program SSB-AVLØP has been installed at all county governors' environmental agencies, which are responsible for collecting data from the municipalities. The county environmental agencies then send the data to SSB on disc. Since 1994 onwards, the reporting system SSB-AVLØP has been extended also to include data on scattered settlements. Discharge figures from SSB-AVLØP are reported to NIVA. NIVA uses these figures in the model* "TEOTIL" *to calculate the total discharges of phosphorus and nitrogen to Norwegian coastal waters. The figures take into account retention in watercourses.*

** PU (population units) is the number of permanent residents plus the number of population equivalents (next page) in an area.*

In Eastern and Southern Norway a large proportion of the municipal wastewater is purified in "high grade" plants. Such plants account for 94 per cent of total treatment capacity in this area. These areas, as well as Sør-Trøndelag, are also the areas with the highest hydraulic capacity per inhabitant. For example, the plants serving Oslo/Akershus have a capacity of more than 1.5 PU per inhabitant. Along the coast from Rogaland county and norhwards, most waste water is only mechanically treated, and high grade treatment plants account for only 34 per cent of total treatment capacity. In 1996, 2.210 municipal waste water treatment plants with a treatment capacity of at least 50 PU were registered in Norway. Their total treatment capacity was 5.4 million PU. The 17 largest plants each had a treatment capacity of 50.000 PU or more, and they treated almost half of all municipal waste water. Only 2 of these large plants are based on mechanical purification. Fjords are the recipients of the discharges from about 65 per cent of the total capacity of the plants.

Preferably, the annual loads from sewage effluents will be estimated as the product of annual flow and flow-weighted concentrations, which previously in particular has been the case for the sewage plants situated in the Skagerrak area (i.e. the area involved in the North Sea Agreement), but from 1994 has come into force for most plants.

For the rest of the municipal wastewater, the loads will be estimated by multiplying the number of people with the coefficients listed.

For crude (untreated) sewage discharges, PARCOM (Summary Record document PARCOM 10/10/1, 1988), has recommended the following derived per capita loads to be used for nutrients:

	PARCOM 1988:			NORWAY:		
BOD	0.063	kg	O/person/day	0.046	kg	O/person/day
COD				0.094	kg	O/person/day
TOC				0.023	kg	/person/day
SPM	0.063	kg	/person/day	0.042	kg	/person/day
Total N	0.009	kg	N/person/day	0.012	kg	N/person/day
Total P	0.0027	kg	P/person/day	0.0016	kg	P/person/day

The Norwegian coefficients are based on recent studies of Norwegian sewerage districts. These data will also be used to calculate contaminant loads from the different treatment plants, reduced by the removal efficiency of the treatment plants. Municipal sewage also includes a portion of industrial effluents. The fraction of the total person equivalents (p.e.) is proportioned between sewage and industrial wastewater according to the number of persons and the size of industrial effluents connected to each treatment plant.

For metals in sewage discharges the calculated loads are based on measured concentrations and flows in larger treatment plants in the Oslo part of the Glomma area. Metal inputs from the rest of the country are estimated from local knowledge (*) as follows:

Substance	*Cu*	*Zn*	*Cd*	*Pb*	*Cr-T*	*Ni*	*Hg*
mg/person-equivalent/day (p.e.)	*30*	*35*	*0.2*	*1.0*	*2.9*	*5.0*	*0.10*

The coefficients used in 1997 are the same as those used for calculations in 1992-1996. The coefficients are based on the results of an investigation on this topic launched by SFT (1993), i.e. monitoring at different types of treatment plants especially in the Oslo part of the Glomma area. Measured/estimated loads from sewage are listed in table 5a.

**Sources:*

OVA, 1998: Bekkelaget renseanlegg. Årsrapport med nøkkeltall 1997. OVA-publikasjon.
SFT, 1993: Miljøgifter i kommunalt avløpsvann. 93:10.
VEAS, 1998: Årsmelding 1997. Rapport fra Vestfjordens Avløpsselskap.

C.2 Describe the determinands, other than those specified in paragraph 2.1 of the Principles, that are included in the current monitoring programme and which may be relevant for the Comprehensive Study on Riverine Inputs and Direct Discharges (voluntary reporting):

All determinands monitored/estimated in accordance with the mandate or on a voluntary basis are mentioned above.

Industrial Effluents (Table 5b.)

C.3 Describe the methods of measurement and calculation used, including information on the number of samples and the concentration upon which the measurement is based (ref.: Section 6 of the Principles), including for those under voluntary reporting:

Industrial effluents

Sampling frequency for industrial wastewater varies from weekly mixed samples to samples taken at random, but at least twice a year. Figures on measured and estimated loads from industrial activities in the different areas are shown in table 5b. According to SFT, about 90 per cent of the industrial discharges of the substances in question are included in the total. This percentage is probably even higher for Total-P and Total-N.

C.4 Give any other relevant information (e.g. proportion of substance discharged as insoluble material):

No further comments.

C.5 Give any available information on other discharges directly to Convention Waters - through e.g. urban run-off and stormwater overflows - that are not covered by the data in tables 5a. and 5b.:

Other inputs

(Nutrients in area runoff from "Down Stream areas" of main and tributary rivers and rivers not monitored)

The pollution load model calculates the load from each pollution source by using area and activity specific load coefficients multiplied by areas (in square kilometres) of different categories and activity numbers, eg. population. The coefficients used are prepared according to precipitation, climate, vegetation and soil in the different areas.

Source:

Holtan, H. og S.O. Åstebøl, 1990: Håndbok i innsamling av data om forurensningstilførsler til vassdrag og fjorder. Revidert utgave. NIVA-Jordforsk 0-89043/0-892301 (l.nr.2501).

To estimate load from agricultural land area runoff, coefficients in the range of 50-200 kg Total-P and 2000-6500 kg Total-N km²/year are used depending on point sources, location of the agricultural land in relation to major tributaries, and agricultural production intensity. Load from upland (remote unpolluted) areas were estimated by using export coefficients in the range of 4-6 kg Total-P and 200-600 kg Total-N km²/year. The highest values were used in areas most affected by long range pollution (acid rain) along the Southern and Western coast. The coefficients are based on mean annual runoff for the period 1931-60.

Total nutrient discharges from downstream areas, and in the different subareas, are shown in table 6b (Runoff).

C.6 Describe the determinands, other than those specified in paragraph 2.1 of the Principles, that are included in the current monitoring programme and which may be relevant for the Comprehensive Study on Riverine Inputs and Direct Discharges (voluntary reporting):

No further comments.

D. Riverine Inputs for the year 1997

Main Rivers (Tables 6a. and 7a.)

D.1 Describe the methods of measurement and calculation used, including information on the number of samples and the concentration (Table 7a.) upon which the measurement is based (ref.: Section 5 of the Principles), including for those under voluntary reporting:

Methodology for assessment of riverine inputs

In carrying out the Survey, the methodology described in the Commissions Document "Principles of the Comprehensive Study on Riverine Inputs" (1988 and 1993) and in the 1990-Report from Norway (Holtan et al., 1991), was followed.

As for "Site selection" we refer to the abovementioned documents, but have chosen to repeat most of the text concerning "Sampling strategy and frequency", only with necessary adjustments.

Compared with the years 1990-1992 the programme was reduced in 1993-1996 and also in 1997.

In all main rivers, except Suldalslågen and Alta, 12 samples have been taken at regular monthly intervals during the sampling period from January to December 1997, as described in PARCOM 10//10/1.

For the "unpolluted" rivers Suldalslågen (No 7) and Alta (No 10), where, on the basis of existing knowledge, the concentration levels are very low, the requirement of 12 data sets per annum was found too stringent. These rivers were therefore sampled 4 times per annum. This sampling strategy should be sufficient enough to obtain a reliable estimate of the pollution load for these two rivers.

The sample frequency for the main rivers is shown in the table below.

Sampling sites and frequency of the main rivers.

River/Location	J	F	M	A	M	J	J	A	S	O	N	D
Glomma at Sarpsfoss	x	x	x	x	X	x	x	x	x	x	x	x
Drammenselva upstream outlet	x	x	x	x	X	x	x	x	x	x	x	x
Numedalslågen at Bommestad	x	x	x	x	X	x	x	x	x	x	x	x
Skienselva at Klosterfoss	x	x	x	x	X	x	x	x	x	x	x	x
Otra upstream outlet	x	x	x	x	X	x	x	x	x	x	x	x
Orre upstream outlet	x	x	x	x	X	x	x	x	x	x	x	x
Orkla at Vormstad	x	x	x	x	X	x	x	x	x	x	x	x
Vefsna upstream Mosjøen	x	x	x	x	X	x	x	x	x	x	x	x
Suldalslågen upstream outlet		x				x		x		x		
Alta upstream Alta			x			x		x		x		

In 1997 the water samples were taken by local persons as in 1990 - 1996. The persons were carefully instructed in advance. The samples were sent to the laboratory at NIVA immediately after sampling, usually arriving at NIVA within 24 to 36 hours later.

Calculation of annual load

The first of the 2 formulas given in the Paris Commission document and the 1990-Report (Holtan et al., 1991) was used for calculating loads for all main rivers and most of the larger rivers.

This equation is a formula suited for estimating annual load when sampling dates are evenly spaced in time. Essentially it expresses the annual load (L) as the product of a flow weighted estimate of annual mean concentration and annual flow (Qa). Then the annual load estimate can be strongly biased if the sampling frequency increases during periods of high flow. Incidents with high flow will have a great influence on the estimate, and high concentrations during such periods will eventually lead to an overestimated annual load. A better method for estimating annual load when the sampling frequency increases with flow would be to use the above mentioned formula to make estimates of monthly loads and sum these to an estimate of annual load. (1995- and 1996-data from Glomma and Drammenselva were treated in this way).

The second formula was used where continous records were not available.

For the other rivers, which have been monitored only once, the best available estimates of flow (catchment area multiplied by specific runoff adjusted for deviations from normal precipitation) and flow-weighted concentrations have been used to estimate contaminant loads. Flow data, especially from the Northern part of Norway, are not all ice-corrected.

D.2 Give any other relevant information (e.g. proportion of substance transported by the river in particulate form):

No further comments.

D.3 Describe the determinands, other than those specified in paragraph 2.1 of the Principles, that are included in the current monitoring programme and which may be relevant for the Comprehensive Study on Riverine Inputs and Direct Discharges (voluntary reporting):

In 1997 analyses of lindane and PCBs have been performed two times in samples from all main rives.

Tributary Rivers (Tables 6b. and 7b.)

D.4 Describe the methods of measurement and calculation used, including information on the number of samples and the concentration (Table 7b.) upon which the measurement is based (ref.: Section 5 of the Principles):

For the other rivers (tributaries), the concentrations are partly based on samples taken at the "standard" frequency (12, i.e. monthly, or more data sets per annum), which is the case for most rivers in the Skagerrak region. As for the rivers draining to the rest of the North Sea and the Norwegian Sea up to Børselva in the county of Sør-Trøndelag, all rivers except 2 in the Suldalslågen area were sampled at least once in 1997. The concentrations are based on measurements of these samples and compared with measurements from the last decade. With regard to the 2 rivers not sampled in 1997, most data are from samples gathered/analysed in 1996.

As for the rest of the rivers draining to the Norwegian Sea, only 4 in the Orkla area (Gaula, Nidelva, Figga/Leksdalselva, Årgårdselva) were sampled and analysed for nutrients, particular suspended matter and conductivity. Concerning rivers draining to the Barents Sea only samples from 1 river (Tana) was gathered and analysed in 1997. These samples were analysed for all "OSPAR" parameters, except Hg, PCB and lindane. In addition to the mentioned rivers/parameters, some of the other rivers in the Orkla, Vefsna and Alta areas were sampled and analysed for nitrate, silicate and conductivity. With regard to the rivers not sampled and the parameters not analysed in 1997, most data are from samples gathered/analysed in 1996.

PCBs and lindane were only sampled/analysed in 2 of the Oslo rivers in 1997. As for Hg, this parameter was analysed once in all rivers mentioned above. For all rivers not sampled/analysed for lindane, PCBs and Hg, the concentrations of these parameters are estimated on the basis of knowledge about the activity in the different drainage areas, the findings from the main rivers and samples/-analyses from these areas in 1990-1996. We have not been able to report these data (Table 7b) herewith.

D.5 Give any other relevant information (e.g. proportion of substance transported by the river in particulate form):

No further comments.

D.6 Describe the determinands, other than those specified in paragraph 2.1 of the Principles, that are included in the current monitoring programme and which may be relevant for the Comprehensive Study on Riverine Inputs and Direct Discharges (voluntary reporting):

No further comments.

D.7 Give any available information on other inputs - through e.g. polder effluents or from coastal areas - that are not covered by data in tables 6a. and 6b.:

Discharges from aquacultural industry in the coastal areas are not covered by data in tables 6a and b.

E. Limits of detection

E.1 Information concerning limits of detection should be presented in Table 8 which includes different columns for rivers/tributaries, sewage effluents and industrial effluents. Any important comments may be presented here.

Information concerning limits of detection for main and tributary rivers is presented in Table 8. As for sewage and industrial effluents we do not have this information.

F. National comments

F.1 Give a general summary of the main results as presented in the tables 5, 6 and 7 and comment, as appropriate, on these results.

1997-data from the wastewater treatment plants (table 5a) is similar to the 1996-data. Data for heavy metals in sewage water is from 1996, except data from the Oslo area which is based on measurements from 1997.

In this report the results (1997) are given for riverine inputs of 10 main rivers and 145 tributaries (tables 6 and 7). Thus the current monitoring programme covers drainage from 75 per cent of the main land areas. For discharges entering directly into marine recipients, i.e. sewage and industrial effluents, estimates are based on data from effluent control programmes. Area runoff of Total phosphorus, Total nitrogen, phosphates, nitrates and ammonia from these coastal zones are estimated by use of area specific runoff coefficients.

According to the results of the 1997 study, the total annual nutrient loads to coastal waters from main and tributary rivers in Norway are approximately 1445 tonnes of phosphorus and 59650 tonnes of nitrogen. Riverine inputs of metals and micropollutants are low. Some concentrations of Cd and a few Pb-concentrations are lower than the detection limit set by OSPAR. Therefore, two quantities have been estimated: one assuming that the true concentration is zero and the other assuming that the true

concentration is the limit of detection. This provides maximum and minimum concentrations between which lies the true estimate. When evaluating inputs these data provide a basis for upper and lower estimates.

Inputs of cadmium are thus measured/calculated to be between 3.6 and 4.6 tonnes and for mercury between 271 and 370 kg. The "below detection limit problem" also applies for the inputs of PCBs which are between 0.04 and 45 kg. The pesticide lindane was found in all analyses, but in small amounts. The lindane contamination in Norwegian rivers is mostly considered to be due to long-range air pollution. The total load is estimated to about 80 kg. The largest share of heavy metals comprise copper and zinc, with input estimates of 264 and 765 tonnes, from main and tributary rivers.

Retention of nutrients and micropollutants in the many threshold fjords of Norway is not included in the above given input figures. Estimates of retention of these substances would presumably reduce the actual input to open marine waters.

F.2 Indicate any significant change in inputs and concentrations in comparison to previous years. Comment on these changes as appropriate.

The input-values vary to a great extent with the volume of the discharges (fig. 1). It is therefore difficult to say anything certain about altered conditions in the different rivers, even if there may be indications of an improved situation for most rivers/most parameters. However, the period from 1990 to 1997 might be to short to say if this is a real trend.

Statistical trend analyses (by the recommended tool "trend-y-tector") showed, however, significant reductions in the yearly inputs of nutrients and heavy metals for the following rivers with long time series: river Glomma (1978-1996), Total-P and Total-N, river Otra (1980-1996), also Total-P and Total-N and river Orkla (1974-1996), Cu and Zn, even if the 1995-flow was a disturbing element, especially in the river Glomma.

Concerning the concentrations of the different parameters/rivers, the mean values are at about the same level from year to year. This may be indicating slightly lower nutrient values. As for the other parameters, the methods and detection limits have been changed during the period. The time is therefore too short to indicate a possible trend.

F.3 Indicate and explain, if appropriate:

- Where and why the applied procedures do not comply with agreed procedures
- Significant changes in monitoring sites, important for comparison of the data before and after the date of the change
- Incomplete or distorted data.

The detection limits used for Cd and Pb at NIVA were above those requested (Holtan et al., 1991). All Cd-, Pb-, also Cu- and Zn-samples from 1992 therefore have been analysed at the Norwegian Institute for Air Research (NILU), where metal determinations are performed on an ICP-MS-instrument. On this instrument the recommended detection limits from PARCOM (Cd: 10 ng/l, Pb: 0.1 µg/l) are followed.

From 1993, the limit of detection has been lowered from 2 to 1 ng/l (mercury) and from 0.05 to 0.03 ng/l (PCBs). This is a result of refinement and optimalisation of the methods.
The monitoring sites have been the same during the whole period.

Table 5a. Sewage Effluents
Reported Maritime Area of the OSPAR Convention in 1997 by Norway

			1 Cd [t]	5 Hg [t]	6 Cu [t]	2 Pb [t]	7 Zn [t]	8 g-HCH [kg]	9 PCB [kg]	10 NH4-N [kt]	11 NO3-N [kt]	12 PO4-P [kt]	13 Total N [kt]	14 Total P [kt]	3 SPM [kt]	15 As [t]	16 Total Cr [t]	17 Ni [t]	18 TOC [t]	20 AOX [t]
168	Alta	lower	0.001	0.000	0.4	0.01	0.4			0.3	0.002	0.03	0.4	0.05	0.7		0.04	0.1	363	
		upper	0.001	0.000	0.4	0.01	0.4			0.3	0.002	0.03	0.4	0.05	0.7		0.04	0.1	363	
		comment						NI	NI							NI				NI
73	Barents Sea (NO)	lower	0.001	0.000	0.4	0.01	0.4			0.3	0.002	0.03	0.4	0.05	0.7		0.04	0.1	363	
		upper	0.001	0.000	0.4	0.01	0.4			0.3	0.002	0.03	0.4	0.05	0.7		0.04	0.1	363	
		comment														NI				
160	Drammenselva	lower	0.01	0.006	1.7	0.06	2.0			0.3	0.002	0.009	0.4	0.01	0.4		0.2	0.3	533	
		upper	0.01	0.006	1.7	0.06	2.0			0.3	0.002	0.009	0.4	0.01	0.4		0.2	0.3	533	
		comment						NI	NI							NI				NI
159	Glomma	lower	0.02	0.009	3.1	0.1	3.6			0.6	0.004	0.01	0.8	0.02	0.8		0.3	0.5	990	
		upper	0.02	0.009	3.1	0.1	3.6			0.6	0.004	0.01	0.8	0.02	0.8		0.3	0.5	990	
		comment						NI	NI							NI				NI
170	Inner Oslofford	lower	0.02	0.006	7.7	0.2	6.2			1.6	0.09	0.01	1.9	0.02	1.8		0.9	1.4	3384	
		upper	0.02	0.006	7.7	0.2	6.2			1.6	0.09	0.01	1.9	0.02	1.8		0.9	1.4	3384	
		comment						NI	NI							NI				NI
161	Numedalslågen	lower	0.02	0.01	1.8	0.08	2.8			0.6	0.004	0.02	0.8	0.03	1.5		0.3	0.5	1290	
		upper	0.02	0.01	1.8	0.08	2.8			0.6	0.004	0.02	0.8	0.03	1.5		0.3	0.5	1290	
		comment						NI	NI							NI				NI
163	Otra	lower	0.02	0.009	3.2	0.1	3.7			0.6	0.004	0.04	0.8	0.07	2.3		0.3	0.5	1645	
		upper	0.02	0.009	3.2	0.1	3.7			0.6	0.004	0.04	0.8	0.07	2.3		0.3	0.5	1645	
		comment						NI	NI							NI				NI
162	Skienselva	lower	0.006	0.003	0.9	0.03	1.1			0.3	0.002	0.007	0.3	0.01	0.3		0.09	0.2	320	
		upper	0.006	0.003	0.9	0.03	1.1			0.3	0.002	0.007	0.3	0.01	0.3		0.09	0.2	320	
		comment						NI	NI							NI				NI
75	Skagerrak (NO)	lower	0.09	0.04	18	0.6	19			4.0	0.1	0.1	5.1	0.2	7.1		2.2	3.4	8162	
		upper	0.09	0.04	18	0.6	19			4.0	0.1	0.1	5.1	0.2	7.1		2.2	3.4	8162	
		comment																		

Table 5a. Sewage Effluents
Reported Maritime Area of the OSPAR Convention in 1997 by Norway

			1 Cd [t]	5 Hg [t]	6 Cu [t]	2 Pb [t]	7 Zn [t]	8 g-HCH [kg]	9 PCB [kg]	10 NH4-N [kt]	11 NO3-N [kt]	12 PO4-P [kt]	13 Total N [kt]	14 Total P [kt]	3 SPM [kt]	15 As [t]	16 Total Cr [t]	17 Ni [t]	18 TOC [t]	20 AOX [t]
164	Orreelva	lower	0.03	0.02	3.0	0.1	6.5			1.1	0.008	0.06	1.5	0.1	3.6		0.4	0.7	2573	
		upper	0.03	0.02	3.0	0.1	6.5			1.1	0.008	0.06	1.5	0.1	3.6		0.4	0.7	2573	
		comment						NI	NI							NI				NI
165	Sudalslågen	lower	0.02	0.01	4.8	0.2	5.6			1.5	0.01	0.1	2.0	0.2	7.2		0.5	0.8	4187	
		upper	0.02	0.01	4.8	0.2	5.6			1.5	0.01	0.1	2.0	0.2	7.2		0.5	0.8	4187	
		comment						NI	NI							NI				NI
83	North Sea (NO)	lower	0.05	0.03	7.8	0.3	12			2.7	0.02	0.2	3.6	0.3	11		0.8	1.5	6759	
		upper	0.05	0.03	7.8	0.3	12			2.7	0.02	0.2	3.6	0.3	11		0.8	1.5	6759	
		comment																		
166	Orkla	lower	0.04	0.01	6.6	0.2	7.8			2.0	0.01	0.2	2.6	0.3	7.5		0.7	1.1	4862	
		upper	0.04	0.01	6.6	0.2	7.8			2.0	0.01	0.2	2.6	0.3	7.5		0.7	1.1	4862	
		comment						NI	NI							NI				NI
167	Vefsna	lower	0.01	0.007	2.5	0.07	2.9			1.5	0.01	0.1	2.0	0.2	5.0		0.2	0.7	2728	
		upper	0.01	0.007	2.5	0.07	2.9			1.5	0.01	0.1	2.0	0.2	5.0		0.2	0.7	2728	
		comment						NI	NI							NI				NI
72	Norwegian Sea (NO)	lower	0.05	0.02	9.2	0.3	10.7			3.4	0.02	0.3	4.6	0.6	12		0.9	1.8	7590	
		upper	0.05	0.02	9.2	0.3	10.7			3.4	0.02	0.3	4.6	0.6	12		0.9	1.8	7590	
		comment																		

Table 5b. Industrial Effluents
Reported Maritime Area of the OSPAR Convention in 1997 by Norway

			1 Cd [t]	5 Hg [t]	6 Cu [t]	2 Pb [t]	7 Zn [t]	8 g-HCH [kg]	9 PCB [kg]	10 NH4-N [kt]	11 NO3-N [kt]	12 PO4-P [kt]	13 Total N [kt]	14 Total P [kt]	3 SPM [kt]	15 As [t]	16 Total Cr [t]	17 Ni [t]	18 TOC [t]	20 AOX [t]
168	Alta	lower											0.002	0.001	376.7					
		upper											0.002	0.001	376.7					
		comment	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI				NI	NI	NI	NI	NI
73	Barents Sea (NO)	lower											0.002	0.001	376.7					
		upper											0.002	0.001	376.7					
		comment																		
160	Drammenselva	lower				0.000							0.02	0.001	0.1					
		upper				0.000							0.02	0.001	0.1					
		comment	NI	NI	NI		NI	NI	NI	NI	NI	NI				NI	NI	NI	NI	NI
159	Glomma	lower	0.002	0.009	6.6	0.02	0.9						0.1	0.03	0.6	0.00	0.9	0.4		
		upper	0.002	0.009	6.6	0.02	0.9						0.1	0.03	0.6	0.00	0.9	0.4		
		comment						NI	NI	NI	NI	NI							NI	NI
170	Inner Oslofford	lower			0.02	0.001	0.5						0.1	0.001	0.5		0.00	0.00		
		upper			0.02	0.001	0.5						0.1	0.001	0.5		0.00	0.00		
		comment	NI	NI				NI	NI	NI	NI	NI				NI			NI	NI
161	Numedalslågen	lower	0.001	0.000	0.007	0.004	0.01						0.2	0.03	1.4	0.00	0.01	0.1	8.9	
		upper	0.001	0.000	0.007	0.004	0.01						0.2	0.03	1.4	0.00	0.01	0.1	8.9	
		comment						NI	NI	NI	NI	NI								
163	Otra	lower	0.001		1.4	0.05	0.4						0.003	0.002	0.2	0.1	0.00	1.4		
		upper	0.001		1.4	0.05	0.4						0.003	0.002	0.2	0.1	0.00	1.4		
		comment						NI	NI	NI	NI	NI							NI	NI
162	Skienselva	lower	0.000	0.001	0.08	0.000	0.01						1.1	0.02	0.5		0.00	0.2	9.6	
		upper	0.000	0.001	0.08	0.000	0.01						1.1	0.02	0.5		0.00	0.2	9.6	
		comment						NI	NI	NI	NI	NI								NI
75	Skagerrak (NO)	lower	0.003	0.01	8.1	0.08	1.8						1.6	0.08	3.2	0.1	0.9	2.2	19	
		upper	0.003	0.01	8.1	0.08	1.8						1.6	0.08	3.2	0.1	0.9	2.2	19	
		comment																		

Table 5b. Industrial Effluents
Reported Maritime Area of the OSPAR Convention in 1997 by Norway

			1 Cd [t]	5 Hg [t]	6 Cu [t]	2 Pb [t]	7 Zn [t]	8 g-HCH [kg]	9 PCB [kg]	10 NH4-N [kt]	11 NO3-N [kt]	12 PO4-P [kt]	13 Total N [kt]	14 Total P [kt]	3 SPM [kt]	15 As [t]	16 Total Cr [t]	17 Ni [t]	18 TOC [t]	20 AOX [t]
164	Orreelva	lower	0.000	0.000	0.000	0.000	0.02						0.04	0.004	1332	0.00	0.03	5.30	35	
		upper	0.000	0.000	0.000	0.000	0.02						0.04	0.004	1332	0.00	0.03	5.30	35	
		comment						NI	NI	NI	NI	NI								NI
165	Sudalslågen	lower	0.9	0.009	0.9	3.9	46						1.1	0.07	64	0.00	0.2	3.8	151	
		upper	0.9	0.009	0.9	3.9	46						1.1	0.07	64	0.00	0.2	3.8	151	
		comment						NI	NI	NI	NI	NI								NI
83	North Sea (NO)	lower	0.9	0.009	0.9	3.9	46						1.2	0.08	1397	0.00	0.3	9.1	186	
		upper	0.9	0.009	0.9	3.9	46						1.2	0.08	1397	0.00	0.3	9.1	186	
		comment																		
166	Orkla	lower	0.048	0.000	1.6	0.2	8.3						0.8	0.04	322	0.00	0.2	0.06	45	
		upper	0.048	0.000	1.6	0.2	8.3						0.8	0.04	322	0.00	0.2	0.06	45	
		comment						NI	NI	NI	NI	NI								NI
167	Vefsna	lower	0.003	0.000	16	0.4	42						0.7	0.06	1069	0.6	0.03	1.0	16	
		upper	0.003	0.000	16	0.4	42						0.7	0.06	1069	0.6	0.03	1.0	16	
		comment						NI	NI	NI	NI	NI								NI
72	Norwegian Sea (NC	lower	0.051	0.000	18	0.6	51						1.5	0.1	1391	0.6	0.2	1.1	61	
		upper	0.051	0.000	18	0.6	51						1.5	0.1	1391	0.6	0.2	1.1	61	
		comment																		

Table 6a. Main Riverine Inputs
Reported Maritime Area of the OSPAR Convention in 1997 by Norway

			1 Cd [t]	5 Hg [t]	6 Cu [t]	2 Pb [t]	7 Zn [t]	8 g-HCH [kg]	9 PCB [kg]	10 NH4-N [kt]	11 NO3-N [kt]	12 PO4-P [kt]	13 Total N [kt]	14 Total P [kt]	3 SPM [kt]	15 As [t]	16 Total Cr [t]	17 Ni [t]	18 TOC [t]	20 AOX [t]
168	Alta	lower	0.003	0	2.5	0.1	1.1	0.2	0	0.002	0.1	0.01	0.4	0.02	3.0	1.5	0	0.7	9181	
		upper	0.026	0.003	2.5	0.1	1.1	0.2	0.6	0.009	0.1	0.01	0.4	0.02	3.0	1.5	1.3	0.8	9181	
		comment																		
73	Barents Sea (NO)	lower	*0.003*	*0.000*	*2.5*	*0.1*	*1.1*	*0.2*	*0.0*	*0.002*	*0.1*	*0.012*	*0.4*	*0.023*	*3.0*	*1.5*	*0.0*	*0.7*	*9181*	
		upper	*0.03*	*0.003*	*2.5*	*0.1*	*1.1*	*0.2*	*0.6*	*0.009*	*0.1*	*0.01*	*0.4*	*0.02*	*3.0*	*1.5*	*1.3*	*0.8*	*9181*	
		comment																		
160	Drammenselva	lower	0.091	0.0006	7.6	1.0	24	3.5	0	0.1	2.3	0.01	3.6	0.04	13	1.0	0	4.5	27948	
		upper	0.1	0.008	7.6	1.0	24	3.5	1.7	0.1	2.3	0.01	3.6	0.04	13	1.4	4.0	4.5	27948	
		comment																		
159	Glomma	lower	0.5	0.01	46	9.7	131	9.1	0	0.6	8.3	0.2	12	0.3	213	2.1	0	18	108217	
		upper	0.6	0.03	46	9.7	131	9.1	4.5	0.6	8.3	0.2	12	0.3	213	3.3	10.6	18	108217	
		comment																		
170	Inner Oslofford	lower																		
		upper																		
		comment																		
161	Numedalslågen	lower	0.04	0.007	5.2	1.1	15	1.4	0	0.08	0.7	0.01	1.3	0.03	17	0.5	0.8	1.5	9442	
		upper	0.06	0.007	5.2	1.1	15	1.4	0.6	0.08	0.7	0.01	1.3	0.03	17	0.6	1.6	1.5	9442	
		comment																		
163	Otra	lower	0.1	0.002	2.0	1.2	20	3.6	0	0.06	0.6	0.003	1.1	0.01	5.3	0.8	0	3.2	10713	
		upper	0.1	0.005	2.0	1.2	20	3.6	0.8	0.06	0.6	0.003	1.1	0.01	5.3	0.8	2.0	3.2	10713	
		comment																		
162	Skienselva	lower	0.1	0.001	7.4	0.5	18	3.1	0	0.10	1.4	0.006	2.2	0.03	6.3	0.6	0	2.0	14513	
		upper	0.1	0.007	7.4	0.5	18	3.1	1.4	0.10	1.4	0.006	2.2	0.03	6.3	0.8	3.3	2.0	14513	
		comment																		
75	Skagerrak (NO)	lower	*0.9*	*0.0*	*68*	*13*	*207*	*21*	*0.0*	*1.0*	*13*	*0.2*	*20*	*0.5*	*254*	*5.0*	*0.8*	*29*	*170832*	
		upper	*1.0*	*0.1*	*68*	*13*	*207*	*21*	*8.9*	*1.0*	*13*	*0.2*	*20*	*0.5*	*254*	*6.9*	*22*	*29*	*170832*	
		comment																		

Table 6a. Main Riverine Inputs
Reported Maritime Area of the OSPAR Convention in 1997 by Norway

			1 Cd [t]	5 Hg [t]	6 Cu [t]	2 Pb [t]	7 Zn [t]	8 g-HCH [kg]	9 PCB [kg]	10 NH4-N [kt]	11 NO3-N [kt]	12 PO4-P [kt]	13 Total N [kt]	14 Total P [kt]	3 SPM [kt]	15 As [t]	16 Total Cr [t]	17 Ni [t]	18 TOC [t]	20 AOX [t]
164	Orreelva	lower	0.001	0.0001	0.2	0.08	0.4	0.06	0	0.009	0.1	0.003	0.2	0.009	1.5	0.05	0	0.2	523	
		upper	0.002	0.0002	0.2	0.08	0.4	0.06	0.02	0.009	0.1	0.003	0.2	0.009	1.5	0.05	0.0475	0.2	523	
		comment																		
165	Sudalslågen	lower	0.019	0.0002	1.1	0.2	4.6	0.9	0	0.01	0.3	0.001	0.4	0.004	1.5	0	0	0.4	896	
		upper	0.032	0.002	1.1	0.2	4.6	0.9	0.4	0.01	0.3	0.001	0.4	0.004	1.5	0.2	0.9	0.5	896	
		comment																		
83	North Sea (NO)	lower	*0.02*	*0.0004*	*1.3*	*0.3*	*5.0*	*1.0*	*0.0*	*0.02*	*0.4*	*0.005*	*0.6*	*0.01*	*3.0*	*0.05*	*0.000*	*0.6*	*1418*	
		upper	*0.03*	*0.002*	*1.3*	*0.3*	*5.0*	*1.0*	*0.4*	*0.02*	*0.4*	*0.005*	*0.6*	*0.01*	*3.0*	*0.2*	*0.9*	*0.7*	*1418*	
		comment																		
166	Orkla	lower	0.2	0.002	26.4	0.3	64	0.8	0	0.02	0.4	0.005	0.8	0.01	7.2	0.2	0.5	2.8	10004	
		upper	0.2	0.003	26.4	0.3	64	0.8	0.5	0.02	0.4	0.005	0.8	0.01	7.2	0.3	1.4	2.8	10004	
		comment																		
167	Vefsna	lower	0.1	0.002	14.6	3.9	44	1.7	0	0.06	0.4	0.02	1.6	0.04	28	0.4	0.0	3.2	24931	
		upper	0.1	0.007	14.6	3.9	44	1.7	1.5	0.06	0.4	0.02	1.6	0.04	28	0.8	3.6	3.3	24931	
		comment																		
72	Norwegian Sea (NO)	lower	*0.3*	*0.0*	*41*	*4.3*	*108*	*2.5*	*0.0*	*0.1*	*0.8*	*0.0*	*2.4*	*0.1*	*35*	*0.6*	*0.5*	*6.1*	*34934*	
		upper	*0.3*	*0.0*	*41*	*4.3*	*108*	*2.5*	*2.0*	*0.1*	*0.8*	*0.0*	*2.4*	*0.1*	*35*	*1.2*	*5.0*	*6.1*	*34934*	
		comment																		

Table 6b. Tributary Riverine Inputs
Reported Maritime Area of the OSPAR Convention in 1997 by Norway

			1 Cd [t]	5 Hg [t]	6 Cu [t]	2 Pb [t]	7 Zn [t]	8 g-HCH [kg]	9 PCB [kg]	10 NH4-N [kt]	11 NO3-N [kt]	12 PO4-P [kt]	13 Total N [kt]	14 Total P [kt]	3 SPM [kt]	15 As [t]	16 Total Cr [t]	17 Ni [t]	18 TOC [t]	20 AOX [t]
168	Alta	lower	0.6	0.01	31	5.5	62	3.5	0.0000	0.1	0.5	0.02	2.4	0.05	0.01	3.5	6.0	38	42285	
		upper	0.7	0.02	31	5.6	62	3.5	3.7	0.1	0.5	0.02	2.4	0.05	0.01	3.8	12	39	42285	
		runoff								0.09	1.0	0.02	1.7	0.09						
		comment																		
73	Barents Sea (NO)	lower	*0.6*	*0.01*	*31*	*5.5*	*62*	*3.5*	*0.0000*	*0.1*	*0.5*	*0.02*	*2.4*	*0.05*	*0.01*	*3.5*	*6.0*	*38*	*42285*	
		upper	*0.7*	*0.02*	*31*	*5.6*	*62*	*3.5*	*3.7*	*0.1*	*0.5*	*0.02*	*2.4*	*0.05*	*0.01*	*3.8*	*12*	*39*	*42285*	
		runoff								*0.09*	*1.0*	*0.02*	*1.7*	*0.09*						
		comment																		
160	Drammenselva	lower	0.0044	0.0003	0.3	0.1	1.7	0.1	0.0000	0.00	0.1	0.00	0.2	0.01	0.00	0.1	0.1	0.2	866	
		upper	0.0044	0.0003	0.3	0.1	1.7	0.1	0.0	0.00	0.1	0.00	0.2	0.01	0.00	0.1	0.1	0.2	866	
		runoff								0.01	0.09	0.00	0.1	0.00						
		comment																		
159	Glomma	lower	0.03	0.0000	0.8	0.2	2.0	0.4	0.0	0.07	0.5	0.00	0.7	0.01	0.002	0.3	1.2	1.3	4690	
		upper	0.03	0.0007	0.8	0.2	2.0	0.4	0.1	0.07	0.5	0.00	0.7	0.01	0.002	0.3	1.2	1.3	4690	
		runoff								0.06	0.6	0.01	0.6	0.02						
		comment																		
170	Inner Oslofford	lower	0.03	0.001	1.6	0.6	5.0	0.2	0.04	0.02	0.3	0.01	0.5	0.02	0.01	0.2	0.3	0.7	2328	
		upper	0.03	0.001	1.6	0.6	5.0	0.2	0.1	0.02	0.3	0.01	0.5	0.02	0.01	0.2	0.4	0.7	2328	
		runoff								0.01	0.1	0.00	0.2	0.01						
		comment																		
161	Numedalslågen	lower	0.03	0.0003	0.6	0.2	11	0.2	0.0000	0.03	0.4	0.01	0.7	0.02	0.001	0.2	1.0	0.8	2070	
		upper	0.03	0.0005	0.6	0.2	11	0.2	0.1	0.03	0.4	0.01	0.7	0.02	0.001	0.2	1.0	0.8	2070	
		runoff								0.04	0.4	0.00	0.6	0.02						
		comment																		
163	Otra	lower	0.4	0.01	4.3	3.6	50	6.0	0.0	0.2	1.5	0.01	2.9	0.03	0.01	2.1	0.0	2.3	27019	
		upper	0.4	0.01	4.3	3.6	50	6.0	1.7	0.2	1.5	0.01	2.9	0.03	0.01	2.1	4.1	2.3	27019	
		runoff								0.03	0.3	0.00	0.5	0.01						
		comment																		
162	Skienselva	lower	0.03	0.0008	0.3	0.1	4.2	0.5	0.0	0.02	0.1	0.00	0.3	0.00	0.0009	0.2	0.0	0.3	4302	
		upper	0.03	0.0008	0.3	0.1	4.2	0.5	0.2	0.02	0.1	0.00	0.3	0.00	0.0009	0.2	0.4	0.3	4302	
		runoff								0.02	0.3	0.00	0.4	0.01						
		comment																		
75	Skagerrak (NO)	lower	*0.5*	*0.01*	*7.9*	*4.8*	*74*	*7.5*	*0.0*	*0.4*	*3.0*	*0.03*	*5.3*	*0.09*	*0.03*	*3.1*	*2.6*	*5.6*	*41275*	
		upper	*0.5*	*0.01*	*7.9*	*4.8*	*74*	*7.5*	*2.3*	*0.4*	*3.0*	*0.03*	*5.3*	*0.09*	*0.03*	*3.1*	*7.1*	*5.6*	*41275*	
		runoff								*0.2*	*1.8*	*0.01*	*2.4*	*0.07*						
		comment																		

Table 6b. Tributary Riverine Inputs
Reported Maritime Area of the OSPAR Convention in 1997 by Norway

			1 Cd [t]	5 Hg [t]	6 Cu [t]	2 Pb [t]	7 Zn [t]	8 g-HCH [kg]	9 PCB [kg]	10 NH4-N [kt]	11 NO3-N [kt]	12 PO4-P [kt]	13 Total N [kt]	14 Total P [kt]	3 SPM [kt]	15 As [t]	16 Total Cr [t]	17 Ni [t]	18 TOC [t]	20 AOX [t]
164	Orreelva	lower	0.5	0.004	4.4	4.7	52	8.2	0.0000	0.3	3.2	0.02	6.0	0.1	0.01	1.5	0.4	4.1	40731	
		upper	0.5	0.01	4.4	4.7	52	8.2	2.9	0.3	3.2	0.02	6.0	0.1	0.01	2.1	7.2	6.1	40731	
		runoff								0.2	1.8	0.02	2.8	0.07						
		comment																		
165	Sudalslågen	lower	0.4	0.01	20	11	128	9.3	0.0	0.2	5.4	0.08	8.7	0.2	0.06	2.7	0.0	4.9	34028	
		upper	0.5	0.04	20	11	128	9.3	7.3	0.3	5.4	0.08	8.7	0.2	0.06	6.3	17	8.3	34028	
		runoff								0.4	4.0	0.03	6.5	0.1						
		comment																		
83	North Sea (NO)	lower	*0.9*	*0.02*	*25*	*16*	*181*	*17*	*0.0*	*0.5*	*8.6*	*0.10*	*15*	*0.3*	*0.07*	*4.1*	*0.4*	*9.0*	*74758*	
		upper	*1.0*	*0.05*	*25*	*16*	*181*	*17*	*10.3*	*0.5*	*8.6*	*0.10*	*15*	*0.3*	*0.07*	*8.4*	*25*	*14*	*74758*	
		runoff								*0.5*	*5.8*	*0.05*	*9.3*	*0.2*						
		comment																		
166	Orkla	lower	0.4	0.09	56	4.4	74	17	0.0	0.4	4.5	0.09	9.1	0.2	0.07	8.1	41	46	55939	
		upper	0.6	0.1	56	4.4	74	17	10.0	0.4	4.5	0.09	9.1	0.2	0.07	9.1	51	48	55939	
		runoff								0.4	4.9	0.07	7.5	0.3						
		comment																		
167	Vefsna	lower	0.08	0.1	31	9.3	53	9.9	0.0	0.5	1.7	0.1	4.4	0.2	0.3	10.7	10	25	6761	
		upper	0.4	0.1	31	9.3	53	9.9	6.5	0.5	1.7	0.1	4.4	0.2	0.3	11	19	26	6761	
		runoff								0.2	1.8	0.03	2.9	0.1						
		comment																		
72	Norwegian Sea (NO	lower	*0.5*	*0.2*	*87*	*14*	*127*	*27*	*0.0*	*0.9*	*6.2*	*0.2*	*14*	*0.4*	*0.3*	*19*	*51*	*72*	*62700*	
		upper	*0.9*	*0.2*	*87*	*14*	*127*	*27*	*17*	*0.9*	*6.2*	*0.2*	*14*	*0.4*	*0.3*	*20*	*70*	*74*	*62700*	
		runoff								*0.6*	*6.7*	*0.1*	*10.3*	*0.4*						
		comment																		

Table 7. Contaminant Concentration
Reported Maritime Area of the OSPAR Convention in 1997 by Norway

		1 Cd [µg/l]	5 Hg [µg/l]	6 Cu [µg/l]	2 Pb [µg/l]	7 Zn [µg/l]	8 g-HCH [ng/l]	9 PCB [ng/l]	10 NH4-N [mg/l]	11 NO3-N [mg/l]	12 PO4-P [mg/l]	13 Total N [mg/l]	14 Total P [mg/l]	3 SPM [mg/l]	15 As [µg/l]	16 Total Cr [µg/l]	17 Ni [µg/l]	18 TOC [µg/l]	20 AOX [mg/l]
168 Alta	lower	0.01	0.001		0.02			0.03	0.003							0.5	0.2		
	upper																		
	minimum	0.01	0.001	0.7	0.02	0.2	0.06	0.03	0.003	0.001	0.001	0.123	0.005	0.5	0.6	0.5	0.2	3500	
	maximum	0.01	0.001	1.6	0.12	0.5	0.08	0.03	0.006	0.085	0.017	0.155	0.020	1.36	0.6	0.5	0.6	3500	
	more than 70% > D.L.	NO	NO	YES	YES	YES	YES	NO	NO	YES	YES	YES	YES	YES	YES	NO	NO	YES	
	n	4	4	4	4	4	2	2	4	4	4	4	4	4	1	1	4	1	
	info																		
	st.Dev.	0	0.000	0.44	0.05	0.13	0.01	0	0.002	0.037	0.007	0.015	0.007	0.38			0.2		
73 Barents Sea (NO)	lower	0.01	0.001		0.02			0.03	0.003							0.5	0.2		
	upper																		
	minimum	0.01	0.001	0.7	0.02	0.2	0.06	0.03	0.003	0.001	0.001	0.123	0.005	0.5	0.6	0.5	0.2	3500	
	maximum	0.01	0.001	1.6	0.12	0.5	0.08	0.03	0.006	0.085	0.017	0.155	0.020	1.36	0.6	0.5	0.6	3500	
	more than 70% > D.L.	NO	NO	YES	YES	YES	YES	NO	NO	YES	YES	YES	YES	YES	YES	NO	NO	YES	
	n	4	4	4	4	4	2	2	4	4	4	4	4	4	1	1	4	1	
	info																		
	st.Dev.	0	0.000	0.44	0.05	0.13	0.01	0	0.002	0.037	0.007	0.015	0.007	0.38			0.2		
160 Drammenselva	lower	0.01	0.001					0.03							0.1	0.5			
	upper																		
	minimum	0.01	0.001	0.7	0.07	2.0	0.27	0.03	0.010	0.175	0.001	0.355	0.003	0.87	0.1	0.5	0.4	3500	
	maximum	0.04	0.001	1.6	0.33	4.5	0.64	0.03	0.024	0.440	0.005	0.600	0.006	2.68	0.2	0.5	1.2	3500	
	more than 70% > D.L.	NO	NO	YES	YES	YES	YES	NO	YES	YES	YES	YES	YES	YES	NO	NO	YES	YES	
	n	12	12	12	12	12	2	2	12	12	12	12	12	12	2	3	12	1	
	info																		
	st.Dev.	0.01	0.000	0.27	0.07	0.79	0.26	0	0.004	0.095	0.001	0.081	0.001	0.54	0.09	0	0.2		

Table 7. Contaminant Concentration
Reported Maritime Area of the OSPAR Convention in 1997 by Norway

			1 Cd [µg/l]	5 Hg [µg/l]	6 Cu [µg/l]	2 Pb [µg/l]	7 Zn [µg/l]	8 g-HCH [ng/l]	9 PCB [ng/l]	10 NH4-N [mg/l]	11 NO3-N [mg/l]	12 PO4-P [mg/l]	13 Total N [mg/l]	14 Total P [mg/l]	3 SPM [mg/l]	15 As [µg/l]	16 Total Cr [µg/l]	17 Ni [µg/l]	18 TOC [µg/l]	20 AOX [mg/l]
159	Glomma	lower	0.01	0.001					0.03							0.1	0.5			
		upper																		
		minimum	0.01	0.001	1.2	0.12	2.9	0.25	0.03	0.009	0.195	0.002	0.350	0.005	1.4	0.1	0.5	0.5	5100	
		maximum	0.08	0.004	3.0	1.69	13.6	0.55	0.03	0.083	0.800	0.057	1.010	0.099	75.5	0.2	0.5	1.8	5100	
		more than 70% > D.L.	NO	NO	YES	YES	YES	YES	NO	YES	YES	YES	YES	YES	YES	NO	NO	YES	YES	
		n	12	12	12	12	12	2	2	12	12	12	12	12	12	2	3	12	1	
		info																		
		st.Dev.	0.03	0.001	0.51	0.48	3.33	0.21	0	0.022	0.174	0.016	0.199	0.026	20.9	0.1	0	0.5		
170	Inner Oslofford	lower																		
		upper																		
		minimum																		
		maximum																		
		more than 70% > D.L.																		
		n																		
		info																		
		st.Dev.																		
161	Numedalslågen	lower	0.01	0.001					0.03							0.1	0.5			
		upper																		
		minimum	0.01	0.001	0.7	0.09	2.1	0.47	0.03	0.012	0.047	0.001	0.215	0.005	1.77	0.1	0.5	0.3	3400	
		maximum	0.04	0.009	4.0	0.75	9.0	0.54	0.03	0.100	0.560	0.016	0.800	0.029	19.8	0.3	0.7	0.9	3400	
		more than 70% > D.L.	NO	NO	YES	YES	YES	YES	NO	YES	YES	YES	YES	YES	YES	NO	NO	YES	YES	
		n	12	12	12	12	12	2	2	12	12	12	12	12	12	2	3	12	1	
		info																		
		st.Dev.	0.01	0.002	1.08	0.20	2.2	0.049	0	0.029	0.151	0.004	0.174	0.007	5.03	0.11	0.1155	0.2		

Table 7. Contaminant Concentration
Reported Maritime Area of the OSPAR Convention in 1997 by Norway

		1 Cd [µg/l]	5 Hg [µg/l]	6 Cu [µg/l]	2 Pb [µg/l]	7 Zn [µg/l]	8 g-HCH [ng/l]	9 PCB [ng/l]	10 NH4-N [mg/l]	11 NO3-N [mg/l]	12 PO4-P [mg/l]	13 Total N [mg/l]	14 Total P [mg/l]	3 SPM [mg/l]	15 As [µg/l]	16 Total Cr [µg/l]	17 Ni [µg/l]	18 TOC [µg/l]	20 AOX [mg/l]
163 Otra	lower	0.01	0.001					0.03	0.003							0.5			
	upper																		
	minimum	0.01	0.001	0.4	0.12	3.2	0.84	0.03	0.003	0.085	0.001	0.205	0.002	0.52	0.2	0.5	0.4	1900	
	maximum	0.07	0.003	0.6	0.5	7.3	0.91	0.03	0.040	0.180	0.002	0.315	0.005	3.35	0.2	0.5	1.4	3800	
	more than 70% > D.L.	YES	NO	YES	YES	YES	YES	NO	YES	YES	YES	YES	YES	YES	YES	NO	YES	YES	
	n	12	12	12	12	12	2	2	12	12	12	12	12	12	2	3	12	12	
	info																		
	st.Dev.	0.02	0.000	0.07	0.10	1.25	0.05	0	0.011	0.032	0.000	0.035	0.001	0.81	0.03	0	0.3	695	
162 Skienselva	lower	0.01	0.001		0.02			0.03							0.1	0.5	0.2		
	upper																		
	minimum	0.01	0.001	0.4	0.02	1.6	0.32	0.03	0.003	0.126	0.001	0.285	0.002	0.5	0.1	0.5	0.2	2200	
	maximum	0.05	0.001	3.2	0.23	3.4	0.89	0.03	0.029	0.235	0.002	0.380	0.013	7.15	0.1	0.5	0.4	2200	
	more than 70% > D.L.	NO	NO	YES	YES	YES	YES	NO	YES	YES	YES	YES	YES	YES	NO	NO	YES	YES	
	n	12	12	12	12	12	2	2	12	12	12	12	12	12	2	3	12	1	
	info																		
	st.Dev.	0.01	0.000	0.86	0.06	0.58	0.40	0	0.009	0.041	0.000	0.029	0.003	1.85	0.03	0	0.1		
75 Skagerrak (NO)	lower	0.01	0.001		0.02			0.03							0.1	0.5	0.2		
	upper																		
	minimum	0.01	0.001	0.4	0.02	1.6	0.25	0.03	0.003	0.047	0.001	0.205	0.002	0.5	0.10	0.5	0.2	1900	
	maximum	0.08	0.009	4.0	1.69	13.6	0.91	0.03	0.100	0.800	0.057	1.010	0.099	75.5	0.25	0.7	1.8	5100	
	more than 70% > D.L.	NO	NO	YES	YES	YES	YES	NO	YES	YES	YES	YES	YES	YES	NO	NO	YES	YES	
	n	60	60	60	60	60	10	10	60	60	60	60	60	60	10	15	60	16	
	info																		
	st.Dev.	0.02	0.001	0.88	0.29	2.41	0.25	0	0.020	0.138	0.008	0.163	0.134	####	0.06	0.052	0.3	924	

Table 7. Contaminant Concentration
Reported Maritime Area of the OSPAR Convention in 1997 by Norway

			1 Cd [µg/l]	5 Hg [µg/l]	6 Cu [µg/l]	2 Pb [µg/l]	7 Zn [µg/l]	8 g-HCH [ng/l]	9 PCB [ng/l]	10 NH4-N [mg/l]	11 NO3-N [mg/l]	12 PO4-P [mg/l]	13 Total N [mg/l]	14 Total P [mg/l]	3 SPM [mg/l]	15 As [µg/l]	16 Total Cr [µg/l]	17 Ni [µg/l]	18 TOC [µg/l]	20 AOX [mg/l]
164	Orreelva	lower	0.01	0.001					0.03								0.5			
		upper																		
		minimum	0.01	0.001	1.1	0.08	0.9	0.57	0.03	0.025	0.004	0.001	0.860	0.037	2.81	0.4	0.5	1.1	5500	
		maximum	0.04	0.005	2.9	2.31	9.9	0.65	0.03	0.215	1.9	0.081	2.59	0.19	36.1	0.7	0.5	2	5500	
		more than 70% > D.L.	NO	NO	YES	YES	YES	YES	NO	YES	YES	YES	YES	YES	YES	YES	NO	YES	YES	
		n	12	12	12	12	12	2	2	12	12	12	12	12	12	2	3	12	1	
		info																		
		st.Dev.	0.01	0.001	0.45	0.7	2.59	0.057	0	0.058	0.683	0.022	0.622	0.046	10.6	0.2	0	0.3		
165	Sudalslågen	lower	0.01	0.001					0.03	0.003						0.1	0.5	0.2		
		upper																		
		minimum	0.01	0.001	0.5	0.05	1.5	0.14	0.03	0.003	0.155	0.001	0.200	0.001	0.59	0.1	0.5	0.2	500	
		maximum	0.04	0.001	0.7	0.14	4.9	0.79	0.03	0.011	0.18	0.001	0.27	0.003	1.03	0.1	0.5	0.4	500	
		more than 70% > D.L.	NO	NO	YES	YES	YES	YES	NO	YES	YES	YES	YES	YES	YES	NO	NO	YES	YES	
		n	4	4	4	4	4	2	2	4	4	4	4	4	4	1	1	4	1	
		info																		
		st.Dev.	0.02	0.000	0.1	0.04	1.52	0.46	0	0.004	0.012	0.000	0.029	0.001	0.19			0.1		
83	North Sea (NO)	lower	0.01	0.001					0.03	0.003						0.1	0.5	0.2		
		upper																		
		minimum	0.01	0.001	0.5	0.05	0.9	0.14	0.03	0.003	0.004	0.001	0.2	0.001	0.59	0.1	0.5	0.2	500	
		maximum	0.04	0.005	2.9	2.31	9.9	0.79	0.03	0.215	1.9	0.081	2.59	0.19	36.1	0.7	0.5	2	5500	
		more than 70% > D.L.	NO	NO	YES	YES	YES	YES	NO	YES	YES	YES	YES	YES	YES	NO	NO	YES	YES	
		n	16	16	16	16	16	4	4	16	16	16	16	16	16	3	4	16	2	
		info																		
		st.Dev.	0.01	0.001	0.63	0.64	2.33	0.28	0	0.061	0.687	0.224	0.884	0.052	10.2	0.3	0	0.6	3536	

Table 7. Contaminant Concentration
Reported Maritime Area of the OSPAR Convention in 1997 by Norway

			1 Cd [µg/l]	5 Hg [µg/l]	6 Cu [µg/l]	2 Pb [µg/l]	7 Zn [µg/l]	8 g-HCH [ng/l]	9 PCB [ng/l]	10 NH4-N [mg/l]	11 NO3-N [mg/l]	12 PO4-P [mg/l]	13 Total N [mg/l]	14 Total P [mg/l]	3 SPM [mg/l]	15 As [µg/l]	16 Total Cr [µg/l]	17 Ni [µg/l]	18 TOC [µg/l]	20 AOX [mg/l]
166	Orkla	lower		0.001					0.03	3						0.1	0.5			
		upper																		
		minimum	0.01	0.001	1.5	0.02	4.9	0.26	0.03	0.003	0.058	0.001	0.180	0.002	0.44	0.1	0.5	0.5	1900	
		maximum	0.24	0.002	28.6	0.78	87.9	0.36	0.03	0.018	0.375	0.005	0.520	0.008	6.09	0.7	0.7	2.1	7600	
		more than 70% > D.L.	YES	NO	YES	YES	YES	YES	NO	YES	YES	YES	YES	YES	YES	NO	NO	YES	YES	
		n	23	12	23	23	23	2	2	12	12	16	16	16	12	14	15	23	12	
		info																		
		st.Dev.	0.06	0.000	6.86	0.16	20.1	0.071	0	0.005	0.101	0.001	0.104	0.002	1.76	0.2	0.0594	0.5	1651	
167	Vefsna	lower	0.01	0.001					0.03	3						0.1	0.5	0.2		
		upper																		
		minimum	0.01	0.001	0.2	0.03	1.1	0.14	0.03	0.003	0.016	0.001	0.068	0.002	0.49	0.1	0.5	0.1	3500	
		maximum	0.11	0.002	5.9	1.22	14.5	0.29	0.03	0.026	0.380	0.009	0.595	0.013	12.9	0.1	0.5	1.2	3500	
		more than 70% > D.L.	NO	NO	YES	YES	YES	YES	NO	YES	YES	YES	YES	YES	YES	NO	NO	YES	YES	
		n	12	12	12	12	12	2	2	12	12	12	12	12	12	2	3	12	1	
		info																		
		st.Dev.	0.03	0.000	1.66	0.33	4.1	0.106	0	0.007	0.101	0.003	0.165	0.003	3.46	0	0	0.3		
72	Norwegian Sea (NO)	lower	0.01	0.001					0.03	3						0.1	0.5	0.2		
		upper																		
		minimum	0.01	0.001	0.2	0.02	1.1	0.14	0.03	0.003	0.016	0.001	0.068	0.002	0.44	0.1	0.5	0.1	1900	
		maximum	0.24	0.002	28.6	1.22	87.9	0.36	0.03	0.026	0.380	0.009	0.595	0.013	12.9	0.7	0.7	2.1	7600	
		more than 70% > D.L.	NO	NO	YES	YES	YES	YES	NO	YES	YES	YES	YES	YES	YES	NO	NO	YES	YES	
		n		24	35	35	35	4	4	24	24	28	28	28	24	16	18	35	13	
		info																		
		st.Dev.	0.05	0.000	6.70	0.27	19.6	0.092	0	0.006	0.11	0.002	0.131	0.002	2.76	0.2	0.055	0.5		

Table 8. Detection Limits
Reported Maritime Area of the OSPAR Convention in 1997 by Norway

			1 Cd [µg/l]	5 Hg [µg/l]	6 Cu [µg/l]	2 Pb [µg/l]	7 Zn [µg/l]	8 g-HCH [ng/l]	9 PCB [ng/l]	10 NH4-N [mg/l]	11 NO3-N [mg/l]	12 PO4-P [mg/l]	13 Total N [mg/l]	14 Total P [mg/l]	3 SPM [mg/l]	15 As [µg/l]	16 Total Cr [µg/l]	17 Ni [µg/l]	18 TOC [µg/l]	20 AOX [mg/l]
168	Alta	Riverine	0.01	0.001	0.1	0.02	0.2	0.03	0.03	0.003	0.001	5E-04	0.001	0.001	0.1	0.1	0.5	0.2	200	
73	Barents Sea (NO)	Riverine																		
160	Drammenselva	Riverine	0.01	0.001	0.1	0.02	0.2	0.03	0.03	0.003	0.001	5E-04	0.001	0.001	0.1	0.1	0.5	0.2	200	
159	Glomma	Riverine	0.01	0.001	0.1	0.02	0.2	0.03	0.03	0.003	0.001	5E-04	0.001	0.001	0.1	0.1	0.5	0.2	200	
170	Inner Oslofford	Riverine																		
161	Numedalslågen	Riverine	0.01	0.001	0.1	0.02	0.2	0.03	0.03	0.003	0.001	5E-04	0.001	0.001	0.1	0.1	0.5	0.2	200	
163	Otra	Riverine	0.01	0.001	0.1	0.02	0.2	0.03	0.03	0.003	0.001	5E-04	0.001	0.001	0.1	0.1	0.5	0.2	200	
162	Skienselva	Riverine	0.01	0.001	0.1	0.02	0.2	0.03	0.03	0.003	0.001	5E-04	0.001	0.001	0.1	0.1	0.5	0.2	200	
75	Skagerrak (NO)	Riverine																		
164	Orreelva	Riverine	0.01	0.001	0.1	0.02	0.2	0.03	0.03	0.003	0.001	5E-04	0.001	0.001	0.1	0.1	0.5	0.2	200	
165	Sudalslågen	Riverine	0.01	0.001	0.1	0.02	0.2	0.03	0.03	0.003	0.001	5E-04	0.001	0.001	0.1	0.1	0.5	0.2	200	
83	North Sea (NO)	Riverine																		
166	Orkla	Riverine	0.01	0.001	0.1	0.02	0.2	0.03	0.03	0.003	0.001	5E-04	0.001	0.001	0.1	0.1	0.5	0.2	200	
167	Vefsna	Riverine	0.01	0.001	0.1	0.02	0.2	0.03	0.03	0.003	0.001	5E-04	0.001	0.001	0.1	0.1	0.5	0.2	200	
72	Norwegian Sea (NO)	Riverine																		

Table 9. Catchment-dependent information
Reported Maritime Area of the OSPAR Convention in 1997 by Norway

		Flow Rate [1000m³/d]	LTA [1000m³/d]	Minimum FR [1000m³/d]	Maximum FR [1000m³/d]	LTA info (years)	Number of sites	Mean or Median
168	Alta	7186	7487	2445	96854	1961-90	1	
73	Barents Sea (NO)							
160	Drammenselva	21877	26743	7344	52808	1961-90	1	
159	Glomma	58134	60324	22170	151779	1961-90	1	
170	Inner Oslofford							
161	Numedalslågen	7608	10082	2540	36089	1961-90	1	
163	Otra	10921	12841	4389	24433	1961-90	1	
162	Skienselva	18074	22611	4320	50976	1961-90	1	
75	Skagerrak (NO)							
164	Orreelva	260	333	13.7	1016	1961-90	1	
165	Sudalslågen	4907	7422	1097	25246	1961-90	1	
83	North Sea (NO)							
166	Orkla	7132	5374	1984	53715	1961-90	1	
167	Vefsna	19515	15620	3499	111802	1961-90	1	
72	Norwegian Sea (NO)							

Annex 8

PORTUGAL

Table 5a. Sewage Effluents
Reported Maritime Area of the OSPAR Convention in 1997 by Portugal

			1 Cd [t]	5 Hg [t]	6 Cu [t]	2 Pb [t]	7 Zn [t]	8 g-HCH [kg]	9 PCB [kg]	10 NH4-N [kt]	11 NO3-N [kt]	12 PO4-P [kt]	13 Total N [kt]	14 Total P [kt]	3 SPM [kt]
228	Tejo												7.4	2.2	45.1
		comment	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI			

Table 5b. Industrial Effluents
Reported Maritime Area of the OSPAR Convention in 1997 by Portugal

			1 Cd [t]	5 Hg [t]	6 Cu [t]	2 Pb [t]	7 Zn [t]	8 g-HCH [kg]	9 PCB [kg]	10 NH4-N [kt]	11 NO3-N [kt]	12 PO4-P [kt]	13 Total N [kt]	14 Total P [kt]	3 SPM [kt]
228	Tejo			0.026											
		comment	NI		NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI

Table 6a. Main Riverine Inputs
Reported Maritime Area of the OSPAR Convention in 1997 by Portugal

			1 Cd [t]	5 Hg [t]	6 Cu [t]	2 Pb [t]	7 Zn [t]	8 g-HCH [kg]	9 PCB [kg]	10 NH4-N [kt]	11 NO3-N [kt]	12 PO4-P [kt]	13 Total N [kt]	14 Total P [kt]	3 SPM [kt]
228	Tejo	lower	1.2	0.73	40.89	42.5	113			0.81	25.7	2.7		3.5	294
		upper	1.3	1.41	40.89	43	282			0.81	25.7	2.7		3.5	294
		comment			Aver.			NI	NI	Aver.	Aver.	Aver.	NI	Aver.	Aver.

Table 6b. Tributary Riverine Inputs
Reported Maritime Area of the OSPAR Convention in 1997 by Portugal

			1 Cd [t]	5 Hg [t]	6 Cu [t]	2 Pb [t]	7 Zn [t]	8 g-HCH [kg]	9 PCB [kg]	10 NH4-N [kt]	11 NO3-N [kt]	12 PO4-P [kt]	13 Total N [kt]	14 Total P [kt]	3 SPM [kt]
228	Tejo	lower	0.07	0.0003	0.146	0.08	2.8			1.1	0.16	0.18		0.24	8.48
		upper	0.08	0.03	0.146	0.08	2.8			1.1	0.16	0.18		0.24	8.48
		comment			Aver.	Aver.	Aver.	NI	NI	Aver.	Aver.	Aver.	NI	Aver.	Aver.

Table 7. Contaminant Concentration
Reported Maritime Area of the OSPAR Convention in 1997 by Portugal

			1 Cd [µg/l]	5 Hg [µg/l]	6 Cu [µg/l]	2 Pb [µg/l]	7 Zn [µg/l]	8 g-HCH [ng/l]	9 PCB [ng/l]	10 NH4-N [mg/l]	11 NO3-N [mg/l]	12 PO4-P [mg/l]	13 Total N [mg/l]	14 Total P [mg/l]	3 SPM [mg/l]
228	Tejo	lower	0.04	0.06	1.9	0.79	4			0.03	1.1	0.16		0.2	13.8
		upper	0.05	0.09	1.9	1	10.9			0.03	1.1	0.16		0.2	13.8
		minimum	<0,01	0.05	0.8	0.1	<10			0.02	0.73	0.11		0.13	2.1
		maximum	0.13	0.18	5.1	5.5	15.5			0.09	1.6	0.21		0.23	25
		more than 70% > D.L.	no	no	yes	no	no	NI	NI				NI		
		n	13	6	13	12	13			11	9	12		12	12
		info													
		st.Dev.													

Table 8. Detection Limits
Reported Maritime Area of the OSPAR Convention in 1997 by Portugal

			1 Cd [µg/l]	5 Hg [µg/l]	6 Cu [µg/l]	2 Pb [µg/l]	7 Zn [µg/l]	8 g-HCH [ng/l]	9 PCB [ng/l]	10 NH4-N [mg/l]	11 NO3-N [mg/l]	12 PO4-P [mg/l]	13 Total N [mg/l]	14 Total P [mg/l]	3 SPM [mg/l]
228	Tejo	Sewage	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI
		Industrial	NI	0.026	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI
		Riverine	0.01	0.05	0.2	0.2	0.01	NI	NI	NI	NI	NI	NI	NI	NI

Table 9. Catchment-dependent information
Reported Maritime Area of the OSPAR Convention in 1997 by Portugal

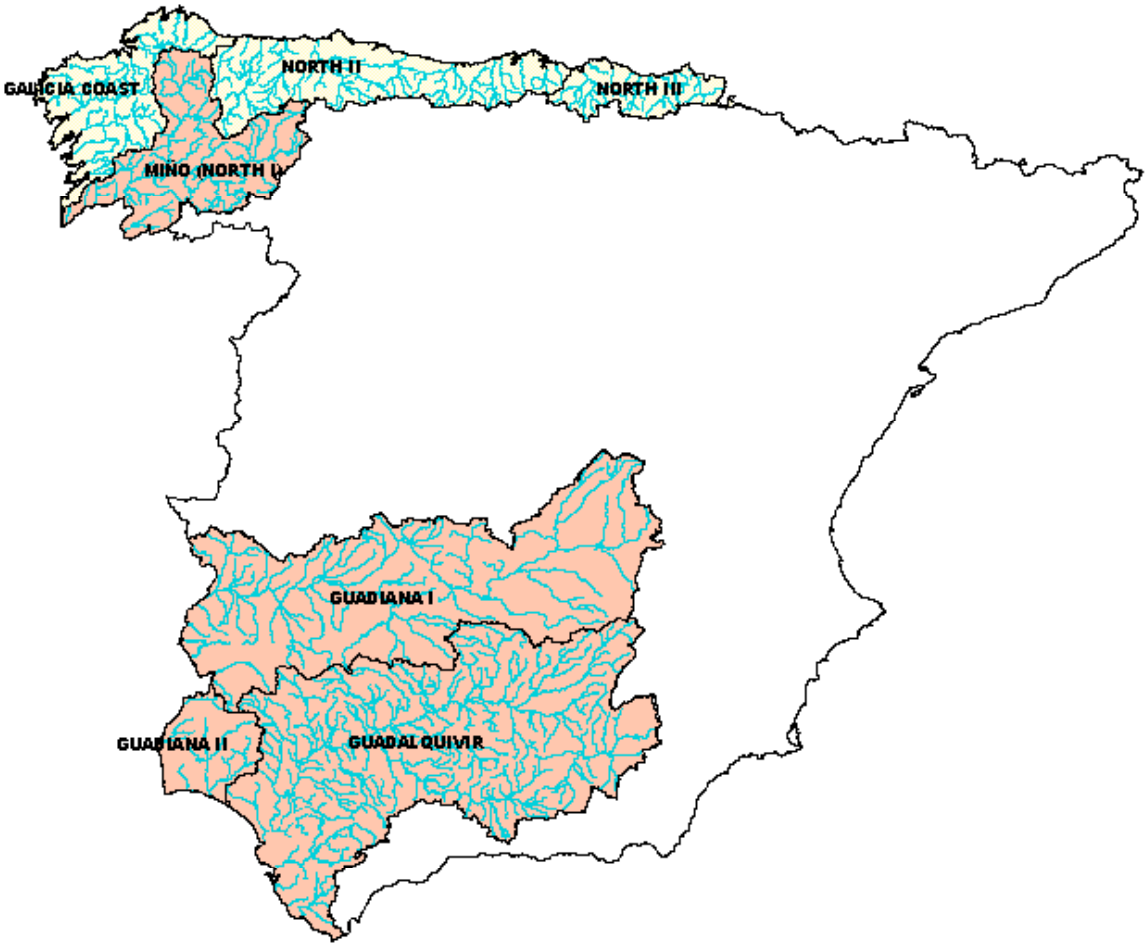
		Flow Rate [1000m³/d]	LTA [1000m³/d]	Minimum FR [1000m³/d]	Maximum FR [1000m³/d]	LTA info (years)	Number of sites	Mean or Median
228	Tejo	60480					5	

Annex 9

SPAIN

Annual report on riverine inputs and direct discharges to Convention waters during the year 1997 by Spain.

Annual Report
on Riverine Inputs and Direct Discharges to Convention Waters during the year 1997 by Spain



Annual report on riverine inputs and direct discharges by Spain to Convention waters during the year 1997

Name, address and contact numbers of reporting authority to which any further enquiry should be addressed:

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A. General information

Table 1: General overview of river systems (for riverine inputs) and direct discharge areas (for direct discharges) included in the data report

Country: **Spain**

Name of river, subarea and discharge area[1]	Nature of the receiving water[2]	optional: national reference number	optional: map reference number
Miño	coastal water		
Guadiana	coastal water		
Guadalquivir	coastal water		

[1] i.e. name of estuary or length of coastline
[2] i.e. estuary or coastal water; if an estuary, state the tidal range and the daily flushing volume

B. Total riverine inputs and direct discharges for the year....

B.1 Comments on the Total Riverine Inputs and Direct Discharges as presented in Table 4a:

[none]

C. Direct discharges for the year 1997

Sewage Effluents (Table 5a.)

C.1 Describe the methods of measurement and calculation used, including information on the number of samples and the concentration upon which the measurement is based (ref.: Section 6 of the Principles), including for those under voluntary reporting:

[none]

C.2 Describe the determinands, other than those specified in paragraph 2.1 of the Principles, that are included in the current monitoring programme and which may be relevant for the Comprehensive Study on Riverine Inputs and Direct Discharges (voluntary reporting):

[none]

Industrial Effluents (Table 5b.)

C.3 Describe the methods of measurement and calculation used, including information on the number of samples and the concentration upon which the measurement is based (ref.: Section 6 of the Principles), including for those under voluntary reporting:

[none]

C.4 Give any other relevant information (e.g. proportion of substance discharged as insoluble material):

[none]

C.5 Give any available information on other discharges directly to Convention Waters - through e.g. urban run-off and stormwater overflows - that are not covered by the data in tables 5a. and 5b.:

[none]

C.6 Describe the determinands, other than those specified in paragraph 2.1 of the Principles, that are included in the current monitoring programme and which may be relevant for the Comprehensive Study on Riverine Inputs and Direct Discharges (voluntary reporting):

[none]

D. Riverine inputs for the year 1997

Main Rivers (Tables 6a. and 7a.)

D.1 Describe the methods of measurement and calculation used, including information on the number of samples and the concentration (Table 7a.) upon which the measurement is based (ref.: Section 5 of the Principles), including for those under voluntary reporting:

The method used for the calculation of the annual load is described in paragraph 5.11 of the principles. The sampling frequency is monthly.

D.2 Give any other relevant information (e.g. proportion of substance transported by the river in particulate form):

[none]

D.3 Describe the determinands, other than those specified in paragraph 2.1 of the Principles, that are included in the current monitoring programme and which may be relevant for the Comprehensive Study on Riverine Inputs and Direct Discharges (voluntary reporting):

[none]

Tributary Rivers (Tables 6b. and 7b.)

D.4 Describe the methods of measurement and calculation used, including information on the number of samples and the concentration (Table 7b.) upon which the measurement is based (ref.: Section 5 of the Principles):

The method used is the same as the one used for main rivers

D.5 Give any other relevant information (e.g. proportion of substance transported by the river in particulate form):

[none]

D.6 Describe the determinands, other than those specified in paragraph 2.1 of the Principles, that are included in the current monitoring programme and which may be relevant for the Comprehensive Study on Riverine Inputs and Direct Discharges (voluntary reporting):

[none]

D.7 Give any available information on other inputs - through e.g. polder effluents or from coastal areas - that are not covered by data in tables 6a. and 6b.:

[none]

E. Limits of detection

E.1 Information concerning limits of detection should be presented in Table 8 which includes different columns for rivers/tributaries, sewage effluents and industrial effluents. Any important comments may be presented here.

[none]

F. National Comments

F.1 Give a general summary of the main results as presented in the tables 5, 6 and 7 and comment, as appropriate, on these results.

[none]

F.2 Indicate any significant change in inputs and concentrations in comparison to previous years. Comment on these changes as appropriate.

[none]

F.3 Indicate and explain, if appropriate:

- where any why the applied procedures do not comply with agreed procedures
- significant changes in monitoring sites, important for comparison of the data before and after the date of the change
- incomplete or distorted data

Monitoring sites have changed for rivers Miño and Guadiana, in order to get closer to the mouth.

For the river Miño, the monitoring station was in Orense (nº 01631), and now it is in Salvatierra do Miño (nº NO02620002)

For the river Guadiana, the monitoring station was in Badajoz (nº 04018), and now it is in Sanlucar de Guadiana

Table 6a. Riverine inputs to the maritime area in 1997 by Spain

Main riverine inputs			Quantities --->												
Discharge area (or name of river)	Flow rate [1000 m³/d] 1997	LTA (period)	Cd [10^3 kg]	Hg [10^3 kg]	Cu [10^3 kg]	Pb [10^3 kg]	Zn [10^3 kg]	g-HCH [kg]	PCBs (1) [kg]	NH4-N [10^6 kg]	NO3-N [10^6 kg]	PO4-P [10^6 kg]	Total N [10^6 kg]	Total P [10^6 kg]	SPM(2) [10^6 kg]
Miño	13,879	18,910			0 51			157 159			11 11			0.3 0.3	61 61
Guadiana	21,918	4,192	0 0.8		0 8	0 1.6	320 320			0.2 0.3	9.8 9.8	0.2 0.2			615 615
Guadalquivir	22,816	19,808 (42-88)	6.8 6.8	2.3 2.3	68 68	10.6 10.6	538	0 83		2.9 2.9	58 58	0.6 0.6	115 115	1.4 1.4	450 450
Total:			6.8 7.6	2.3 2.3	68 127	10.6 12	858 320	157 243		3.1 3.2	79 79	0.7 0.7	115 115	1.7 1.7	1125 1125

(1) IUPAC Nos 28, 52, 101, 118, 153, 138, 180.
(2) Suspended particulate matter
LTA: Long-term average flow: specify period

Table 6b. Riverine inputs to the maritime area in 1997 by Spain

Tributary riverine inputs			Quantities ---> (lower estimate (aa)/upper estimate (bb)); alternatively: (estimate (aa), precision in % (bb))												
Discharge area (or name of river)	Flow rate [1000 m³/d] 1997	LTA (period)	Cd [10^3 kg]	Hg [10^3 kg]	Cu [10^3 kg]	Pb [10^3 kg]	Zn [10^3 kg]	g-HCH [kg]	PCBs (1) [kg]	NH4-N [10^6 kg]	NO3-N [10^6 kg]	PO4-P [10^6 kg]	Total N [10^6 kg]	Total P [10^6 kg]	SPM(2) [10^6 kg]
Louro	144.5369		0.0 5.3		0.9 1.2						0.2 0.2			0.02 0.02	3.5 3.5
Miño	Subtotal:		0.0 5.3		0.9 1.2						0.2 0.2			0.02 0.02	3.5 3.5
Guadiamar	1381	611 (42-88)	4.5 4.5	0.06 0.06	24 24	3.7 3.7	2169 2169	0.0 5.0		0.1	0.7	0.007	1.2	0.04	9.7
Guadaira	550	553 (42-88)	0.1 0.1	0.3 0.3	1.1 1.1	1.7 1.7	36 36	0.0 2.0		3.3 3.3	0.002 0.002	0.4 0.4	6.4 6.4	0.3 0.3	36 36
Guadalquivir	Subtotal:	1164	4.7 4.7	0.3 0.3	25 25	5.4 5.4	2205 2205	0.0 7.0		3.4 3.3	0.7 0.0	0.4 0.4	7.6 6.4	0.4 0.3	45 36
	Total:	1164	4.7 10.0	0.3 0.3	26 26	5.4 5.4	2205 2205	0.0 7.0		3.4 3.3	0.9 0.2	0.4 0.4	7.6 6.4	0.4 0.3	49 39

(1) IUPAC Nos 28, 52, 101, 118, 153, 138, 180.
(2) Suspended particulate matter
LTA: Long-term average flow: specify perioc

Table 6c. Riverine inputs to the maritime area in 1997 by Spain

Total Riverine Inputs			Quantities ---> (lower estimate (aa)/upper estimate (bb)); alternatively: (estimate (aa), precision in % (bb))												
Discharge area	Flow rate [1000 m³/d] 1997	LTA (period)	Cd [10^3 kg]	Hg [10^3 kg]	Cu [10^3 kg]	Pb [10^3 kg]	Zn [10^3 kg]	g-HCH [kg]	PCBs (1) [kg]	NH4-N [10^6 kg]	NO3-N [10^6 kg]	PO4-P [10^6 kg]	Total N [10^6 kg]	Total P [10^6 kg]	SPM(2) [10^6 kg]
Miño	13878.72	18910	0.000 5.3	0.000 0.000	0.9 52	0.000 0.000	0.000 0.000	157 159		0.000 0.000	12 12	0.000 0.000	0.000 0.000	0.3 0.3	64 64
Guadiana	21917.81	4192	0.000 0.8	0.000 0.000	0.000 8.0	0.000 1.6	320 320	0.000 0.000		0.2 0.3	9.8 9.8	0.2 0.2	0.000 0.000	0.000 0.000	615 615
Guadalquivir	22816	20,972	11.5 11.5	2.6 2.6	93 93	16 16	2743 2743	0.000 90		6.2 6.2	59 59	1.0 1.0	123 123	1.8 1.8	495 495
Overall total:			11 18	2.6 2.6	94 153	16 18	3063 3063	157 250		6.5 6.5	80 80	1.1 1.1	123 123	2.1 2.1	1174 1174

(1) IUPAC Nos 28, 52, 101, 118, 153, 138, 180.
(2) Suspended particulate matter
LTA: Long-term average flow: specify period

Table 7a. Contaminant concentrations of Spanish rivers discharging to the maritime area

Main river				Contaminant concentrations -->												
Discharge area	Flow rate [1000 m³/d]		Mean or	Cd	Hg	Cu	Pb	Zn	g-HCH	PCBs (1)	NH4-N	NO3-N	PO4-P	Total N	Total P	SPM(2)
	annual	LTA	median?	[µg/l]	[µg/l]	[µg/l]	[µg/l]	[µg/l]	[ng/l]	[ng/l]	[mg/l]	[mg/l]	[mg/l]	[mg/l]	[mg/l]	[mg/l]
Miño	13,879	18,910	Mean				NI	NI	40.909	NI	NI	2.117	NI	NI	0.044	8.667
Minimum							NI	NI	0	NI	NI	1.6	NI	NI	0	2
Maximum							NI	NI	136	NI	NI	3.1	NI	NI	0.09	25
> 70 % > d.l. ?			*yes/no*	no	no	no	no	no	yes	no	no	yes	no	no	yes	yes
n				*6*	*2*	*6*	*0*	*0*	*11*	*0*	*0*	*6*	*0*	*0*	*5*	*6*
Guadiana	21917.81	4192	Mean		N.I.	1.429		40	N.I.	N.I.	0.031	1.225	0.02	N.I.	N.I.	76.833
Minimum					N.I.	0		30	N.I.	N.I.	0	0.225	0.01	N.I.	N.I.	16
Maximum					N.I.	10		70	N.I.	N.I.	0.108	2.59	0.039	N.I.	N.I.	490
> 70 % > d.l. ?			*yes/no*	no	no	no	no	yes	no	no	yes	yes	yes	no	no	yes
n				*7*	*0*	*7*	*7*	*7*	*0*	*0*	*7*	*12*	*7*	*0*	*0*	*12*
Guadalquivir	22816	19800	Mean	0.8182	0.2727	8.1818	1.2727	64.545			0.3476	6.9397	0.0699	13.867	0.1675	54
Minimum				0	0	0	0	0			0.104	0.299	0.0099	11.082	0.1	15
Maximum				4	1	40	7	150			0.576	16.422	0.1287	16.652	0.29	141
> 70 % > d.l. ?			*yes/no*	no	no	no	no	yes	no		yes	yes	yes	yes	yes	yes
n				*12*	*12*	*12*	*12*	*12*	*12*		*12*	*12*	*12*	*12*	*12*	*12*

(1) IUPAC Nos 28, 52, 101, 118, 153, 138, 180 LTA: Long-term average flow

(2) Suspended particulate matter

ND: Not detected > 70 % > d.l. ?: yes if more than 70 % of concentration measurements were above the detection limit (cf. Table 8)

Table 7b. Contaminant concentrations of Spanish rivers discharging to the maritime area

Tributary river				Contaminant concentrations -->												
Discharge area	Flow rate [1000 m³/d]		Mean or	Cd	Hg	Cu	Pb	Zn	g-HCH	PCBs (1)	NH4-N	NO3-N	PO4-P	Total N	Total P	SPM(2)
	annual	LTA	median?	[µg/l]	[µg/l]	[µg/l]	[µg/l]	[µg/l]	[ng/l]	[ng/l]	[mg/l]	[mg/l]	[mg/l]	[mg/l]	[mg/l]	[mg/l]
Louro	144.5369		mean			16.667						3.567			0.423	65.333
Minimum						0						0.3			0.33	12
Maximum						50						5.9			0.57	98
> 70 % > d.l. ?			*yes/no*	no		no						yes			yes	yes
n				*3*		*3*						*3*			*3*	*3*
Guadiamar	1381	611	mean	9	0.1111	47.778	7.3333	4304.4			0.2	1.4286	0.0147	2.33	0.0867	19.222
Minimum				0	0	10	0	400			0.104	0	0.0033	0.33	0.03	5
Maximum				23	1	100	52	10750			0.568	4.646	0.0297	5.95	0.19	72
> 70 % > d.l. ?			*yes/no*	yes	no	yes	no	yes	no		yes	yes	yes	yes	yes	yes
n				*12*	*12*	*12*	*12*	*12*	*12*		*12*	*12*	*12*	*12*	*12*	*12*
Guadaira	550	553	mean	0.7273	1.4545	5.4545	8.3636	180			16.18	0.0084	1.8057	31.9	1.588	178
Minimum				0	0	0	0	50			0.504	0	1.3167	1.95	0.76	24
Maximum				3	6	20	36	760			25.032	0.092	2.4288	45.2	2.3	402
> 70 % > d.l. ?			*yes/no*	no	yes	no	no	yes	no		yes	no	yes	yes	yes	yes
n				*12*	*12*	*12*	*12*	*12*	*12*		*12*	*12*	*12*	*12*	*12*	*12*

(1) IUPAC Nos 28, 52, 101, 118, 153, 138, 180 LTA: Long-term average flow

(2) Suspended particulate matter

ND: Not detected > 70 % > d.l. ?: yes if more than 70 % of concentration measurements were above the detection limit (cf. Table 8)

Table 8. Detection limits for contaminant concentrations of Spanish inputs to the maritime area

#				Detection limits for contaminant concentrations -->												
Sampling point	Type (3)			Cd [µg/l]	Hg [µg/l]	Cu [µg/l]	Pb [µg/l]	Zn [µg/l]	g-HCH [ng/l]	PCBs (1) [ng/l]	NH4-N [mg/l]	NO3-N [mg/l]	PO4-P [mg/l]	Total N [mg/l]	Total P [mg/l]	SPM(2) [mg/l]
Salvatierra (Miño)	R	Main				10	1.2	10	2		0.08	0.02	0.006		0.06	0.3
Pte. N-550 (Louro)	R	Tributary				10	1.2	10	2		0.08	0.02	0.006		0.06	0.3
Sanlucar de Guadiana (Guadiana)	R	Main		0.1	0.1	1.0	0.2	10	10		0.02	0.02	0.003	0.08	0.04	1
Alcala del río (Guadalquivir)	R	Main		0.5	1	10	4.8	10	10		0.015	0.006	0.006	0.5	0.01	1
El Guijo (Guadiamar)	R	Tributary		0.5	1	10	4.8	10	10		0.015	0.006	0.006	0.5	0.01	1
Pte. El Copero (Guadaira)	R	Tributary		0.5	1	10	4.8	10	10		0.015	0.006	0.006	0.5	0.01	1

 # specify here to which part of the inputs this table relates

(1) IUPAC Nos 28, 52, 101, 118, 153, 138, 180; make separate list if needed.
(2) Suspended particulate matter
(3) S: sewage; I: Industrial discharges; R: riverine inputs (main and tributary)
ND: Not detected

Annex 10

SWEDEN

Comments to the annual report on Direct and riverine inputs 1997 to OSPAR Convention waters from Sweden

Discharge Area I:	Kattegat
Nature of the receiving water:	Mostly open coastal water. In the northern part of the area there are some fiords and some archipelago. In the southern part of the area there are two larger bays.
Drainage area, km^2	71 600
Drainage area of rivers, km^2	67 681
Drainage area with measuredrunoff, km^2	64 417
Drainage area with calculated runoff, km^2	3 264
Coastal zones, km^2	3 919
The drainage area consists of:	
urban area	1,8 %
forested area	45,2 %
agricultural area	11,6 %
wetlands (mires)	7,3 %
lake surface	14,2 %
other	19,9 %
Discharge area II:	Skagerrak
Nature of the receiving water:	Mostly archipelago with some deep fiords in-between.
Drainage area, km^2	5 300
Drainage area of rivers, km^2	2 333
Drainage area with measured runoff, km^2	2 244
Drainage area with calculated runoff, km^2	89
Coastal zones, km^2	2 967
The drainage area consists of:	
urban area	5,6 %
forested area	36,5 %
agricultural area	14,1 %
wetlands (mires)	2,9 %
lake surface	3,4 %
other	37,5 %

DIRECT DISCHARGES

Methods of measurement and calculation used:

The ***sewage treatment plants*** in Sweden have different levels of sampling procedures depending on their sizes, as shown in the following table:

Table 1.

Size of treatment plant (pe)	Parameter	Frequency of analyses
201 - 2 000	Tot-P, Tot-N	8 dp/year
201 - 2 000	BOD_7 and COD_{Cr}	8 and 4 dp/year
2 001 - 10 000	Tot-P, Tot-N	2 dp/month
2 001 - 10 000	BOD_7, COD_{Cr}	2 dp/month
10 001 - 20 000	Tot-P	2 dp/month
10 001 - 20 000	NH_4-N, Tot-N	2 dp/month
10 001 - 20 000	BOD_7, COD_{Cr}	2 dp/month
> 20 000	Tot-P	1 wp/week
> 20 000	NH_4-N, Tot-N	1 dp/week
> 20 000	BOD_7	1 dp/week
> 20 000	COD_{Cr}	2 wp/month
> 20 000	Hg, Cd, Pb, Cu, Zn, Cr and Ni	1 wp/month

dp = daily, continuous sampling proportional to the flow during 24 hrs.
wp = weekly, continuous sampling proportional to the flow

The calculation of the pollution load from the larger cities (>20 000 pe) is based upon at least 25 samples/year. The water flow through the treatment plants is measured continuosly. The pollution load is calculated as the product of annual flow and flow weighted concentration. Thus the reported pollution load from the municipal treatment plants is considered to be a fairly correct assumption of the true discharges.

The overflows of the larger municipalities are usually included in the figures given above.

The chemical analyses were performed in accordance to Nordic standard.

BOD_7 Incubation in darkness at 20 ^{o}C for seven days. Nitrification inhibitor (ATU) is added.
COD_{Cr} The dichromate reflux method.

Nitrates (NO_3-N) and Ortophosphates (PO_4-P) were not always reported regularly. The values reported in this input study are to some extent calculated from the knowledge of the situation in Sweden. About 30 % of the total nitrogen was found to be nitrate (NO_3-N) and about 30 % of the total phosphorus was found to be ortophosphate (PO_4-P).

Tot-N and tot-P: Potassium peroxodisulphate digestion, autoanalyzer.
Zn and Cu: Graphite oven AAS.
Pb, Cd and Hg: Graphite oven AAS.

Industrial effluents

Methods of measurement and calculation used, including information on the concentration upon which the measurement is based:

pulp- and paper:	COD_{Cr} , sampling proportional to the flow, daily. BOD_7 , sampling proportional to the flow, monthly. Tot P and tot-N, once a week.
refinery :	COD_{Cr} and BOD_7 , random samples monthly. Metals, sampling four times a year for 5 days/week.
chemical plants:	P and N, random samples weekly. COD_{Cr} and BOD_7, random samples monthly. TOC continuosly.

The analyses were performed in accordance to Swedish and Nordic standards and have been described above.

RIVERINE INPUTS

MAIN RIVERS AND SOME MINOR RIVERS

Methods of measurement and calculation used:

Monthly sampling for water chemistry analysis. Daily measurement of flow. Transport was calculated as daily Q x linear interpolation of concentrations.

N and P analysis as described above.
Cu and Zn graphite oven AAS.
Cd and Pb freeze drying (concentrating), graphite oven AAS.

Instead of tributary rivers the discharges from minor rivers and the coastal areas between the rivers are presented.

MINOR RIVERS NOT MEASURED AND COASTAL AREAS

Methods of measurement and estimation used:

The estimations are based upon the monitoring results of the "neighbourhood" rivers. Weighted coefficients has been calculated for the different minor rivers and coastal areas reported in formats.

Table 5a. Sewage Effluents
Reported Maritime Area of the OSPAR Convention in 1997 by Sweden

		1 Cd [t]	5 Hg [t]	6 Cu [t]	2 Pb [t]	7 Zn [t]	8 g-HCH [kg]	9 PCB [kg]	10 NH4-N [kt]	11 NO3-N [kt]	12 PO4-P [kt]	13 Total N [kt]	14 Total P [kt]	3 SPM [kt]
174	Ätran	0.001	0.0008	0.07	0.01	0.3	NI	NI	0.05	0.03	0.001	0.1	0.003	NI
234	Fylleån													
233	Genevadsån													
177	Göta älv	0.02	0.03	1.9	0.4	3.2	NI	NI				2.2	0.08	NI
175	Himleån													
176	Kungsbackaån	0.0004	0.00008	0.02	0.01	0.2	NI	NI	0.05	0.06	0.002	0.1	0.003	NI
172	Lagan													
173	Nissan	0.0010	0.0005	0.08	0.03	0.3	NI	NI	0.01	0.02	0.002	0.09	0.002	NI
237	Rolfsån													
171	Rönne å	0.0004	0.0004	0.02	0.009	0.1	NI	NI	0.03	0.02	0.001	0.08	0.002	NI
232	Stensån	0.0001	0.0005	0.008	0.001	0.02	NI	NI	0.004	0.003	0.0001	0.01	0.0002	NI
235	Suseån													
231	Vege å													
236	Viskan	NI	NI	NI	NI	NI	NI	NI	0.004	0.004	0.0001	0.02	0.0004	NI

78	Kattegat (SW)	0.03	0.03	2.1	0.5	4.1	NI	NI	0.1	0.1	0.006	2.7	0.09	NI
	Coastal area between Göta älv and Bäveån	NI	NI	NI	NI	NI	NI	NI	0.07	0.05	0.0007	0.2	0.002	NI
178	Bäveån	0.001	0.002	0.07	0.008	0.2	NI	NI	0.04	0.03	0.0005	0.09	0.001	NI
180	Enningdalsälven													
179	Örekilsälven	NI	NI	NI	NI	NI	NI	NI	0.03	0.04	0.0005	0.1	0.002	NI
227	Strömsån	NI	NI	NI	NI	NI	NI	NI	0.0003	0.0004	0	0.001	0.0001	NI
76	Skagerrak (SW)	0.001	0.002	0.07	0.008	0.2	NI	NI	0.1	0.1	0.002	0.4	0.005	NI

Table 5b. Industrial Effluents
Reported Maritime Area of the OSPAR Convention in 1997 by Sweden

		1 Cd [t]	5 Hg [t]	6 Cu [t]	2 Pb [t]	7 Zn [t]	8 g-HCH [kg]	9 PCB [kg]	10 NH4-N [kt]	11 NO3-N [kt]	12 PO4-P [kt]	13 Total N [kt]	14 Total P [kt]	3 SPM [kt]
78	Kattegat (SW)	0.06	0.005	0.5	0.1	3.0	NI	NI	NI	NI	NI	0.1	0.01	NI
76	Skagerrak (SW)	0	0.0006	0.01	0.02	0.04	NI	NI	NI	NI	NI	0.1	0.003	NI

Table 6a. Main Riverine Inputs
Reported Maritime Area of the OSPAR Convention in 1997 by Sweden

			1 Cd [t]	5 Hg [t]	6 Cu [t]	2 Pb [t]	7 Zn [t]	8 g-HCH [kg]	9 PCB [kg]	10 NH4-N [kt]	11 NO3-N [kt]	12 PO4-P [kt]	13 Total N [kt]	14 Total P [kt]	3 SPM [kt]
174	Ätran		0.03	NI	1.3	0.4	5.6	NI	NI	0.1	0.8	0.006	1.6	0.03	NI
234	Fylleån	no main river													
233	Genevadsån	no main river													
177	Göta älv		0.1	0.05	19	5.1	55	NI	NI	0.4	7.6	0.04	13	0.3	NI
175	Himlean	no main river													
176	Kungsbackaån	no main river													
172	Lagan		0.03	NI	1.7	0.6	6.7	NI	NI	0.08	0.7	0.007	1.7	0.04	NI
173	Nissan		0.03	NI	1.2	0.6	9.7	NI	NI	0.08	0.4	0.005	0.9	0.04	NI
237	Rolfsån	no main river													
171	Rönne å		0.01	0.001	0.7	0.2	3.3	NI	NI	0.05	1.3	0.01	1.7	0.03	NI
232	Stensån	no main river													
235	Suseån	no main river													
231	Vege å	no main river													
236	Viskan		0.02	NI	0.7	0.3	3.9	NI	NI	0.08	0.7	0.009	1.4	0.04	NI
78	Kattegat (SW)		0.3	0.05	25	7.1	85	NI	NI	0.8	11	0.08	20	0.5	NI

178	Bäveån		0.004	0.001	0.4	0.09	1.0			0.006	0.06	0.0009	0.1	0.005	NI
180	Enningdalsälven		0.004	0.001	0.2	0.04	1.2	NI	NI	0.002	0.08	0.0004	0.2	0.003	NI
179	Örekilsälven		0.01	NI	0.8	0.2	3.9	NI	NI	0.02	0.3	0.0003	0.6	0.02	NI
227	Strömsån		0.02	NI	1.5	0.04	6.7	NI	NI	0.005	0.05	0.0006	0.1	0.004	NI
76	Skagerrak (SW)		0.04	0.002	2.9	0.4	13	NI	NI	0.04	0.4	0.002	1.0	0.03	NI

Table 6b. Tributary Riverine Inputs
Reported Maritime Area of the OSPAR Convention in 1997 by Sweden

			1 Cd [t]	5 Hg [t]	6 Cu [t]	2 Pb [t]	7 Zn [t]	8 g-HCH [kg]	9 PCB [kg]	10 NH4-N [kt]	11 NO3-N [kt]	12 PO4-P [kt]	13 Total N [kt]	14 Total P [kt]	3 SPM [kt]
174	Ätran	main river													
234	Fylleån		NA	NA	NA	NA	NA	NA	NA	0.02	0.1	0.0009	0.2	0.003	NA
233	Genevadsån		NA	NA	NA	NA	NA	NA	NA	0.01	0.2	0.002	0.2	0.004	NA
177	Göta älv	main river													
175	Himlean		NA	NA	NA	NA	NA	NA	NA	0.01	0.10	0.0009	0.1	0.003	NA
176	Kungsbackaån		NA	NA	NA	NA	NA	NA	NA	0.01	0.1	0.001	0.2	0.004	NA
172	Lagan	main river													
173	Nissan	main river													
237	Rolfsån		NA	NA	NA	NA	NA	NA	NA	0.03	0.3	0.003	0.5	0.009	NA
171	Rönne å	main river													
232	Stensån		0.002	NI	0.1	0.04	0.3	NI	NI	0.009	0.3	0.003	0.4	0.006	NI
235	Suseån		NA	NA	NA	NA	NA	NA	NA	0.02	0.2	0.002	0.3	0.006	NA
231	Vege å		0.003	NI	0.2	0.07	0.5	NI	NI	0.02	0.6	0.005	0.7	0.01	NI
236	Viskan	main river													
78	Kattegat (SW)	coastal areas	0.02	NI	0.6	0.2	2.7	NI	NI	0.06	1.2	0.009	1.6	0.03	NI
178	Bäveån	main river													
180	Enningdalsälven	main river													
179	Örekilsälven	main river													
227	Strömsån	main river													
76	Skagerrak (SW)	coastal areas	0.02	0.005	1.6	0.4	8	NI	NI	0.05	0.5	0.006	1.2	0.004	NI

Table 7. Contaminant Concentration
Reported Maritime Area of the OSPAR Convention in 1997 by Sweden

			1 Cd [µg/l]	5 Hg [µg/l]	6 Cu [µg/l]	2 Pb [µg/l]	7 Zn [µg/l]	8 g-HCH [ng/l]	9 PCB [ng/l]	10 NH4-N [mg/l]	11 NO3-N [mg/l]	12 PO4-P [mg/l]	13 Total N [mg/l]	14 Total P [mg/l]	3 SPM [mg/l]
174	Ätran	lower	0.021	0.0029	1	0.3	3.8			0.09	0.576	0.005	1.154	0.019	
		upper													
		minimum													
		maximum													
		more than 70% > D.L.	yes	yes	yes	yes	yes			yes	yes	yes	yes	yes	
		n	12	4	12	12	12			12	12	12	12	12	
		info						ni	ni						ni
		st.Dev.													
234	Fylleån	lower								0.08	0.666	0.005	1.224	0.02	
		upper													
		minimum													
		maximum													
		more than 70% > D.L.								yes	yes	yes	yes	yes	
		n								12	12	12	12	12	
		info	na	na	na	na	na	na	na						na
		st.Dev.													
233	Genevadsån	lower								0.151	2.196	0.025	2.987	0.065	
		upper													
		minimum													
		maximum													
		more than 70% > D.L.								yes	yes	yes	yes	yes	
		n								12	12	12	12	12	
		info	na	na	na	na	na	na	na						na
		st.Dev.													
177	Göta älv	lower	0.008	0.00325	1.2	0.34	3.5			0.029	0.477	0.003	0.825	0.018	
		upper													
		minimum													
		maximum													
		more than 70% > D.L.	yes	yes	yes	yes	yes			yes	yes	yes	yes	yes	
		n	12	12	12	12	12			12	12	12	12	12	
		info						ni	ni						ni
		st.Dev.													

175	Himleån	lower													
		upper													
		minimum													
		maximum													
		more than 70% > D.L.													
	the load	n													
	figures	info													
	calculated	st.Dev.													
176	Kungsbackaån	lower													
		upper													
		minimum													
		maximum													
		more than 70% > D.L.													
	the load	n													
	figures	info													
	calculated	st.Dev.													
172	Lagan	lower	0.017	0.0045	1	0.32	3.6			0.038	0.27	0.003	0.813	0.02	
		upper													
		minimum													
		maximum													
		more than 70% > D.L.	yes	yes	yes	yes	yes			yes	yes	yes	yes	yes	
		n	12	4	12	12	12			12	12	12	12	12	
		info						ni	ni						ni
		st.Dev.													
173	Nissan	lower	0.029	0.0043	1.3	0.58	8.7			0.081	0.383	0.007	1.042	0.039	
		upper													
		minimum													
		maximum													
		more than 70% > D.L.	yes	yes	yes	tes	yes			yes	yes	yes	yes	yes	
		n	11	4	11	11	11			12	12	12	12	12	
		info						ni	ni						ni
		st.Dev.													
237	Rolfsån	lower													
		upper													
		minimum													
		maximum													
		more than 70% > D.L.													
	the load	n													
	figures	info													
	calculated	st.Dev.													

171	Rönne å	lower	0.027		1.4	0.37	7.1			0.076	1.74	0.01	2.719	0.04	
		upper													
		minimum													
		maximum													
		more than 70% > D.L.	yes		yes	yes	yes			yes	yes	yes	yes	yes	
		n	11		11	11	11			11	11	11	11	11	
		info		ni				ni	ni						ni
		st.Dev.													
232	Stensån	lower	0.017		1	0.32	3.6			0.091	1.689	0.01	2.484	0.037	
		upper													
		minimum													
		maximum													
		more than 70% > D.L.	yes		yes	yes	yes			yes	yes	yes	yes	yes	
		n	12		12	12	12			12	12	12	12	12	
		info		ni				ni	ni						ni
		st.Dev.													
235	Suseån	lower													
		upper													
		minimum													
		maximum													
		more than 70% > D.L.													
	the load	n													
	figures	info													
	calculated	st.Dev.													
231	Vege å	lower													
		upper													
		minimum													
		maximum													
		more than 70% > D.L.													
	the load	n													
	figures	info													
	calculated	st.Dev.													
236	Viskan	lower								0.079	0.79	0.008	1.466	0.044	
		upper													
		minimum													
		maximum													
		more than 70% > D.L.								yes	yes	yes	yes	yes	
	the metal load	n								12	12	12	12	12	
	figures	info						ni	ni						ni
	calculated	st.Dev.													
178	Bäveån	lower	0.024	0.0052	3.2	0.66	6.8			0.045	0.412	0.007	1.06	0.037	
		upper													
		minimum													
		maximum													
		more than 70% > D.L.	yes	yes	yes	yes	yes			yes	yes	yes	yes	yes	
		n	12	12	12	12	12			12	12	12	12	12	
		info						ni	ni						ni
		st.Dev.													

180	Enningdalsälve	lower	0.015	0.0040	0.8	0.13	4.1			0.009	0.256	0.002	0.591	0.011	
		upper													
		minimum													
		maximum													
		more than 70% > D.L.	yes	yes	yes	yes	yes			yes	yes	yes	yes	yes	
		n	12	11	12	12	12			12	12	12	12	12	
		info						ni	ni						ni
		st.Dev.													
179	Örekilsälven	lower	0.02	0.0041	1.5	0.38	6.4			0.047	0.435	0.007	1.056	0.042	
		upper													
		minimum													
		maximum													
		more than 70% > D.L.	yes	yes	yes	yes	yes			yes	yes	yes	yes	yes	
		n	12	3	12	121	12			12	12	12	12	12	
		info						ni	ni						ni
		st.Dev.													
227	Strömsån	lower													
		upper													
		minimum													
		maximum													
		more than 70% > D.L.													
	the load	n													
	figures	info													
	calculated	st.Dev.													

Table 8. Detection Limits
Reported Maritime Area of the OSPAR Convention in 1997 by Sweden

		1 Cd [µg/l]	5 Hg [µg/l]	6 Cu [µg/l]	2 Pb [µg/l]	7 Zn [µg/l]	8 g-HCH [ng/l]	9 PCB [ng/l]	10 NH4-N [mg/l]	11 NO3-N [mg/l]	12 PO4-P [mg/l]	13 Total N [mg/l]	14 Total P [mg/l]	3 SPM [mg/l]
174	Sewage													
	Industrial													
All rivers	Riverine	0.003	0.0001	0.04	0.02	0.2	na	na	0.001	0.001	0.001	0.05	0.005	na

Table 9. Catchment-dependent information
Reported Maritime Area of the OSPAR Convention in 1997 by Sweden

		Flow Rate [1000m³/d]	LTA [1000m³/d]	Minimum FR [1000m³/d]	Maximum FR [1000m³/d]	LTA info (years)	Number of sites	Mean or Median
174	Atran	3.63	5.07			1961-90	1	Mean
234	Fylleån	0.48	0.65			(all)	(all)	(all)
233	Genevadsån	0.23	0.35					
177	Göta älv	40.80	50.53					
175	Himleån	0.31	0.33					
176	Kungsbackaån	0.37	0.41					
172	Lagan	4.86	7.41					
173	Nissan	2.51	3.69					
237	Rolfsån	0.85	1.03					
171	Rönne å	1.11	2.03					
232	Stensån	0.29	0.35					
235	Suseån	0.55	0.64					
231	Vege å	0.43	0.44					
236	Viskan	2.76	3.45					
78	Kattegat (SW)							
178	Bäveån	0.37	0.35					
180	Enningdalsälve	0.61	1.36					
179	Örekilsälven	1.41	2.05					
227	Strömsån	0.27	0.39					
76	Skagerrak (SW)							

Annex 11

UNITED KINGDOM

Table 5a. Sewage Effluents
Reported Maritime Area of the OSPAR Convention in 1997 by United Kingdom

			1.00 Cd [t]	5.00 Hg [t]	6.0 Cu [t]	2.0 Pb [t]	7.0 Zn [t]	8.0 g-HCH [kg]	9.0 PCB [kg]	10.0 NH4-N [kt]	11.0 NO3-N [kt]	12.00 PO4-P [kt]	13.0 Total N [kt]	14.00 Total P [kt]	3 SPM [kt]
218	NI1	lower	0.01	0.00	0.4	0.1	1.4	0.5			0.0	0.06	0.3	0.08	1
		upper	0.02	0.00	0.4	0.2	1.4	0.5			0.1	0.06	0.3	0.08	1
		comment										1996 loads			
216	SC2	lower	0.08	0.01	17.0	5.7	32.0	10.1	0.4	3.6	0.3	0.98	4.5	1.80	18
		upper	0.13	0.01	17.0	5.9	32.0	10.7	87.5	3.6	0.3	0.98	4.5	1.80	18
		comment								1996 loads					
217	SC2a	lower	0.00	0.00	0.2	0.1	0.2	41.5	0.0	0.1	0.0	0.01	0.2	0.01	0
		upper	0.00	0.01	0.2	0.1	0.2	41.5	0.3	0.1	0.0	0.01	0.2	0.01	0
		comment								1996 loads					
92	Atlantic (UK)	lower	0.09	0.01	17.7	5.8	33.6	52.1	0.4	3.7	0.3	1.05	4.9	1.89	20
		upper	0.15	0.01	17.7	6.1	33.6	52.7	87.8	3.7	0.4	1.05	4.9	1.89	20
		comment													
203	E19	lower	0.02	0.00	0.2	0.2	21.2			0.2	0.0	0.03	0.2	0.03	1
		upper	0.02	0.00	0.2	0.2	21.2			0.2	0.0	0.03	0.2	0.03	1
		comment													
204	E20	lower						0.0							
		upper						0.0							
		comment													
205	E21	lower	0.01	0.00	2.6	0.3	2.7	0.1		0.6	0.0	0.10	0.6	0.10	5
		upper	0.01	0.00	2.6	0.3	2.7	0.1		0.6	0.0	0.10	0.6	0.10	5
		comment													
206	E22	lower	0.25	0.01	3.1	1.5	20.5	1.7	1.3	2.4	0.4	0.43	2.9	0.43	10
		upper	0.25	0.01	3.1	1.5	20.5	1.9	2.6	2.4	0.4	0.43	2.9	0.43	10
		comment													
207	E23	lower	0.07	0.00	2.6	2.4	17.4	0.0	0.9	1.6		0.29	1.6	0.29	8
		upper	0.07	0.00	2.6	2.4	17.4	0.7	2.8	1.6		0.29	1.6	0.29	8
		comment													
208	E24	lower		0.00	0.5	0.4	4.5			0.9	0.0	0.21	0.9	0.21	
		upper		0.00	0.5	0.4	4.5			0.9	0.0	0.21	0.9	0.21	
		comment													
209	E25	lower	0.00		0.5	0.2	3.3			0.6	0.1	0.20	0.8	0.20	3
		upper	0.00		0.5	0.2	3.3			0.6	0.1	0.20	0.8	0.20	3
		comment													
90	Celtic Sea (UK)	lower	0.35	0.01	9.5	5.0	69.6	1.9	2.2	6.2	0.6	1.25	6.9	1.25	28
		upper	0.36	0.01	9.5	5.0	69.6	2.8	5.4	6.2	0.6	1.25	7.0	1.25	28
		comment													

			1.00 Cd [t]	5.00 Hg [t]	6.0 Cu [t]	2.0 Pb [t]	7.0 Zn [t]	8.0 g-HCH [kg]	9.0 PCB [kg]	10.0 NH4-N [kt]	11.0 NO3-N [kt]	12.00 PO4-P [kt]	13.0 Total N [kt]	14.00 Total P [kt]	3 SPM [kt]
197	E13	lower	0.00		3.2		9.5	0.8		1.5	0.3	0.37	1.9	0.37	
		upper	0.00		3.2		9.5	0.8		1.5	0.3	0.37	1.9	0.37	
		comment													
198	E14	lower	0.43		6.7	1.8	8.7	2.2		3.0	0.1	0.42	3.1	0.42	
		upper	0.43		6.7	1.8	8.7	2.2		3.0	0.1	0.42	3.1	0.42	
		comment													
199	E15	lower	0.02		2.6	1.8	5.0	3.7		1.9	0.3	0.43	2.2	0.43	
		upper	0.02		2.6	1.8	5.0	3.7		1.9	0.3	0.43	2.2	0.43	
		comment													
200	E16	lower	0.01		7.4	0.4	6.0	1.4		0.4	0.5	0.14	0.8	0.14	4
		upper	0.01		7.4	0.5	6.0	1.4		0.4	0.5	0.14	0.8	0.14	4
		comment													
201	E17	lower	0.01	0.00	1.0	0.4	3.8	1.0		0.8	0.2	0.27	1.0	0.27	5
		upper	0.01	0.00	1.0	0.4	3.8	1.0		0.8	0.2	0.27	1.0	0.27	5
		comment													
202	E18	lower	0.00		0.2	0.0	0.8	0.4		0.2	0.3	0.16	0.6	0.16	1
		upper	0.00		0.2	0.0	0.8	0.4		0.2	0.3	0.16	0.6	0.16	1
		comment													
86	Channel (UK)	lower	0.47	0.00	21.2	4.5	33.8	9.4	0.0	7.8	1.6	1.79	9.6	1.79	10
		upper	0.47	0.00	21.2	4.5	33.8	9.4	0.0	7.9	1.7	1.79	9.7	1.79	10
		comment													
185	E1	lower	0.01	0.00	1.1	0.1	1.7	0.1		0.3	0.0	0.07	0.4	0.07	2
		upper	0.01	0.00	1.1	0.1	1.7	0.1		0.3	0.0	0.07	0.4	0.07	2
		comment													
194	E10	lower	0.01	0.00	1.2	1.1	4.6	1.0		1.0	0.2	0.20	1.2	0.20	4
		upper	0.01	0.00	1.2	1.1	4.6	1.1		1.0	0.2	0.20	1.3	0.20	4
		comment													
195	E11	lower	0.00	0.00	0.3	0.1	0.7	0.2		0.3	0.2	0.15	0.5	0.15	0
		upper	0.00	0.00	0.3	0.1	0.7	0.2		0.3	0.2	0.15	0.6	0.15	0
		comment													
196	E12	lower	0.12	0.01	12.0	7.4	47.6	21.3	0.0	6.0	7.2	3.93	13.7	3.93	19
		upper	0.15	0.01	12.0	7.4	47.6	33.1	81.7	6.0	7.3	3.93	13.9	3.93	19
		comment													
186	E2	lower	0.09	0.00	15.1	2.3	8.3	0.0		2.7		0.39	2.7	0.39	10
		upper	0.09	0.02	15.1	2.3	8.3	0.9		2.7		0.39	2.7	0.39	10
		comment										1996 loads		1996 loads	

			1.00 Cd [t]	5.00 Hg [t]	6.0 Cu [t]	2.0 Pb [t]	7.0 Zn [t]	8.0 g-HCH [kg]	9.0 PCB [kg]	10.0 NH4-N [kt]	11.0 NO3-N [kt]	12.00 PO4-P [kt]	13.0 Total N [kt]	14.00 Total P [kt]	3 SPM [kt]
187	E3	lower	0.00	0.00	0.1	0.0	0.3	0.1		0.2	0.0	0.04	0.2	0.04	0
		upper	0.00	0.00	0.1	0.0	0.3	0.1		0.2	0.0	0.04	0.2	0.04	0
		comment													
188	E4	lower	0.02	0.01	4.7	1.8	9.4	0.0		1.3	0.0	0.31	1.3	0.31	25
		upper	0.02	0.02	4.7	1.8	9.4	0.3		1.3	0.0	0.31	1.3	0.31	25
		comment													
189	E5	lower	0.02	0.01	1.9	0.7	8.0	0.1		1.3	0.1	0.29	1.4	0.29	7
		upper	0.02	0.02	1.9	0.7	8.0	0.5		1.3	0.1	0.29	1.4	0.29	7
		comment													
190	E6	lower	0.01	0.00	1.2	0.7	2.5	0.1	0.1	0.6	0.0	0.14	0.6	0.14	6
		upper	0.01	0.01	1.2	0.7	2.5	0.2	0.1	0.6	0.0	0.14	0.6	0.14	6
		comment													
191	E7	lower	0.00	0.00	0.7	0.7	1.4	0.2	0.1	0.2	0.0	0.05	0.2	0.05	3
		upper	0.00	0.00	0.7	0.7	1.4	0.2	0.1	0.2	0.0	0.05	0.2	0.05	3
		comment													
192	E7a	lower	0.01	0.00	0.8	0.4	2.2	0.3	0.1	0.4	0.1	0.11	0.5	0.11	3
		upper	0.01	0.00	0.8	0.4	2.2	0.4	0.1	0.4	0.1	0.11	0.5	0.11	3
		comment													
193	E9	lower	0.01	0.00	0.8	0.2	2.6			0.9	0.2	0.26	1.1	0.26	2
		upper	0.01	0.00	0.8	0.2	2.6			0.9	0.2	0.26	1.1	0.26	2
		comment													
181	SC2b	lower	0.01	0.02	0.7	0.1	0.9	74.8	0.0		0.0	0.05	0.3	0.06	1
		upper	0.01	0.02	0.7	0.1	0.9	74.9	1.0		0.0	0.05	0.3	0.06	1
		comment													
182	SC3	lower	0.43	0.01	4.5	1.7	7.5	0.2		1.4	0.0	0.27	2.4	0.38	28
		upper	0.43	0.01	4.5	1.7	7.5	0.3		1.4	0.0	0.27	2.4	0.38	28
		comment													
183	SC4	lower	0.01	0.00	2.3	0.9	5.8	1.2		1.2	0.0	0.24	1.8	0.42	9
		upper	0.05	0.01	2.3	1.0	5.8	1.2		1.2	0.0	0.24	1.8	0.42	9
		comment													
184	SC5	lower	0.03	0.01	8.6	3.7	27.1	4.4		3.2	0.1	1.00	5.5	1.49	48
		upper	0.04	0.01	8.6	3.7	27.1	4.4		3.2	0.1	1.00	5.5	1.49	48
		comment										1996 loads			
84	North Sea (UK)	lower	0.78	0.07	56.0	21.8	130.8	103.9	0.4	21.0	8.2	7.50	34.0	8.30	167
		upper	0.86	0.14	56.0	21.9	130.8	118.0	83.1	21.1	8.3	7.50	34.1	8.30	167
		comment													

			1.00 Cd [t]	5.00 Hg [t]	6.0 Cu [t]	2.0 Pb [t]	7.0 Zn [t]	8.0 g-HCH [kg]	9.0 PCB [kg]	10.0 NH4-N [kt]	11.0 NO3-N [kt]	12.00 PO4-P [kt]	13.0 Total N [kt]	14.00 Total P [kt]	3 SPM [kt]
210	E26	lower					0.3			0.0	0.1	0.05	0.1	0.05	1
		upper					0.3			0.0	0.1	0.05	0.1	0.05	1
		comment													
211	E27	lower				0.0			0.0	0.2		0.03	0.3	0.03	
		upper				0.0			0.3	0.2		0.03	0.3	0.03	
		comment													
212	E28	lower	0.05	0.00	3.2	1.8	15.6	0.5		2.9	0.1	0.86	3.0	0.86	8
		upper	0.05	0.00	3.2	1.8	15.6	3.4		2.9	0.1	0.86	3.0	0.86	8
		comment													
213	E29	lower	0.00	0.00	0.2	0.1	1.0	0.3		0.0	0.2	0.16	0.3	0.16	0
		upper	0.00	0.00	0.2	0.1	1.0	1.2		0.0	0.2	0.16	0.3	0.16	0
		comment													
219	E30	lower													
		upper													
		comment													
215	NI2	lower	0.01	0.01	5.6	2.4	20.0	2.3			0.1	0.32	1.9	0.82	17
		upper	0.15	0.01	5.6	2.9	20.0	2.6			0.2	0.32	2.0	0.82	17
		comment										1996 loads			
214	SC1	lower	0.00	0.00	0.2	0.1	0.5	0.3		0.1	0.0	0.05	0.2	0.06	0
		upper	0.00	0.00	0.2	0.1	0.5	0.3		0.1	0.0	0.05	0.2	0.06	0
		comment													
88	Irish Sea (UK)	lower	0.06	0.02	9.2	4.5	37.4	3.3	0.0	3.3	0.5	1.47	5.8	1.98	27
		upper	0.20	0.02	9.2	4.9	37.4	7.4	0.3	3.3	0.6	1.47	5.9	1.98	27
		comment													
Total UK: Direct, Sewage		lower	1.75	0.11	113.5	41.5	305.2	170.5	3.0	42.0	11.3	13.06	61.2	15.21	251
		upper	2.05	0.18	113.6	42.4	305.2	190.4	176.5	42.1	11.5	13.06	61.6	15.22	251

AJO 19.5.99

Table 5b. Industrial Effluents
Reported Maritime Area of the OSPAR Convention in 1997 by United Kingdom

			1.00 Cd [t]	5.00 Hg [t]	6.0 Cu [t]	2.0 Pb [t]	7.0 Zn [t]	8.0 g-HCH [kg]	9.0 PCB [kg]	10.0 NH4-N [kt]	11.0 NO3-N [kt]	12.00 PO4-P [kt]	13.0 Total N [kt]	14.00 Total P [kt]	3 SPM [kt]
218	NI1	lower	0.00	0.00	0.0	0.0	0.6	0.0	0.0	0.0	0.0	0.00	0.1	0.02	1
		upper	0.64	0.03	6.6	2.6	0.8	0.1	0.1	0.0	0.0	0.00	0.1	0.02	1
		comment													
216	SC2	lower	0.00		0.2	0.1	1.2			0.5	2.1	0.10	2.6	0.10	5
		upper	0.08		0.3	0.3	1.2			0.5	2.1	0.10	2.6	0.10	5
		comment										1996 loads		1996 loads	
217	SC2a	lower	0.00	0.00	0.0	0.0	0.0	0.1	0.0		0.0	0.00	0.0	0.00	0
		upper	0.00	0.00	0.0	0.0	0.0	0.1	0.0		0.0	0.00	0.0	0.00	0
		comment													
92	Atlantic (UK)	lower	0.00	0.00	0.2	0.1	1.8	0.1	0.0	0.5	2.1	0.10	2.6	0.12	6
		upper	0.72	0.03	6.9	2.8	2.0	0.2	0.1	0.5	2.1	0.10	2.6	0.12	6
		comment													
203	E19	lower													
		upper													
		comment													
204	E20	lower													
		upper													
		comment													
205	E21	lower													
		upper													
		comment													
206	E22	lower	1.02	0.03	0.4	0.7	44.7	0.0		0.8	0.8	0.00	1.6	0.00	1
		upper	1.02	0.03	0.4	0.7	44.7	0.0		0.8	0.8	0.00	1.6	0.00	1
		comment													
207	E23	lower	0.01		0.2	0.2	1.3						0.0		5
		upper	0.01		0.2	0.2	1.3						0.0		5
		comment													
208	E24	lower	0.03	0.00	0.5	2.8	26.1			0.2		0.01	0.2	0.01	25
		upper	0.03	0.00	0.5	2.8	26.1			0.2		0.01	0.2	0.01	25
		comment													
209	E25	lower													
		upper													
		comment													
90	Celtic Sea (UK)	lower	1.05	0.03	1.2	3.7	72.1	0.0	0.0	0.9	0.8	0.01	1.8	0.01	31
		upper	1.06	0.03	1.2	3.7	72.1	0.0	0.0	0.9	0.8	0.02	1.8	0.02	31
		comment													

			1.00 Cd [t]	5.00 Hg [t]	6.0 Cu [t]	2.0 Pb [t]	7.0 Zn [t]	8.0 g-HCH [kg]	9.0 PCB [kg]	10.0 NH4-N [kt]	11.0 NO3-N [kt]	12.00 PO4-P [kt]	13.0 Total N [kt]	14.00 Total P [kt]	3 SPM [kt]
197	E13	lower			0.1					0.0	0.0	0.00	0.0	0.00	
		upper			0.1					0.0	0.0	0.00	0.0	0.00	
		comment													
198	E14	lower													
		upper													
		comment													
199	E15	lower	0.00		0.0										
		upper	0.00		0.0										
		comment													
200	E16	lower													
		upper													
		comment													
201	E17	lower													
		upper													
		comment													
202	E18	lower			0.1		0.2								
		upper			0.1		0.2								
		comment													
86	Channel (UK)	lower	0.00	0.00	0.2	0.0	0.2	0.0	0.0	0.0	0.0	0.00	0.0	0.00	0
		upper	0.00	0.00	0.2	0.0	0.2	0.0	0.0	0.0	0.0	0.00	0.0	0.00	0
		comment													
185	E1	lower	0.00	0.00	0.5	0.2	0.8			0.0	0.0	0.01	0.0	0.01	6
		upper	0.00	0.00	0.5	0.2	0.8			0.0	0.0	0.01	0.0	0.01	6
		comment													
194	E10	lower													
		upper													
		comment													
195	E11	lower													
		upper													
		comment													
196	E12	lower													
		upper													
		comment													
186	E2	lower	0.00	0.00	0.0	0.0	0.0			0.0			0.0		0
		upper	0.00	0.00	0.0	0.0	0.0			0.0			0.0		0
		comment													

			1.00 Cd [t]	5.00 Hg [t]	6.0 Cu [t]	2.0 Pb [t]	7.0 Zn [t]	8.0 g-HCH [kg]	9.0 PCB [kg]	10.0 NH4-N [kt]	11.0 NO3-N [kt]	12.00 PO4-P [kt]	13.0 Total N [kt]	14.00 Total P [kt]	3 SPM [kt]
187	E3	lower													
		upper													
		comment													
188	E4	lower													
		upper													
		comment													
189	E5	lower	0.12	0.03	9.2	8.9	35.1	0.0		3.8	1.3	0.26	5.3	0.26	17
		upper	0.12	0.04	9.2	8.9	35.1	0.7		3.8	1.3	0.26	5.3	0.26	17
		comment													
190	E6	lower	0.02	0.05	12.4	2.3	6.4	0.0	0.2	0.1	0.0	0.00	0.1	0.00	203
		upper	0.02	0.05	12.4	2.3	6.4	0.1	0.2	0.1	0.0	0.00	0.1	0.00	203
		comment													
191	E7	lower													
		upper													
		comment													
192	E7a	lower	0.02	0.01	3.3	2.9	154.2	0.1	0.1	0.7	0.2	0.02	1.0	0.02	51
		upper	0.03	0.01	3.6	3.4	154.2	0.2	0.1	0.7	0.2	0.02	1.0	0.02	51
		comment													
193	E9	lower	0.02	0.00	0.0	0.3	4.7			0.0	0.0	0.01	0.0	0.01	0
		upper	0.02	0.00	0.0	0.3	4.7			0.0	0.0	0.01	0.0	0.01	0
		comment													
181	SC2b	lower	0.00	0.00	3.0	0.0	0.7	5.0	0.0	0.1	0.0	0.04	0.3	0.13	1
		upper	0.01	0.01	3.0	0.0	0.7	5.1	0.2	0.1	0.0	0.04	0.3	0.13	1
		comment								1996 loads					
182	SC3	lower	0.00	0.00	0.1	0.0	0.3	0.0		0.0	0.1	0.00	0.2	0.00	0
		upper	0.00	0.00	0.1	0.0	0.3	0.0		0.0	0.1	0.00	0.2	0.00	0
		comment													
183	SC4	lower	0.00	0.00	0.1	0.0	0.2			0.0	0.1	0.11	0.1	0.11	0
		upper	0.00	0.00	0.1	0.0	0.2			0.0	0.1	0.11	0.1	0.11	0
		comment													
184	SC5	lower	0.01	0.01	7.9	0.2	11.0			0.3	0.0	0.02	0.9	0.02	2
		upper	0.01	0.01	7.9	0.2	11.0			0.3	0.0	0.02	0.8	0.02	2
		comment										1996 loads		1996 loads	
84	North Sea (UK)	lower	0.18	0.10	36.5	14.9	213.4	5.1	0.2	5.0	1.7	0.48	8.1	0.56	281
		upper	0.20	0.12	36.7	15.5	213.4	6.1	0.4	5.0	1.7	0.48	8.0	0.56	281
		comment													

			1.00 Cd [t]	5.00 Hg [t]	6.0 Cu [t]	2.0 Pb [t]	7.0 Zn [t]	8.0 g-HCH [kg]	9.0 PCB [kg]	10.0 NH4-N [kt]	11.0 NO3-N [kt]	12.00 PO4-P [kt]	13.0 Total N [kt]	14.00 Total P [kt]	3 SPM [kt]
210	E26	lower													
		upper													
		comment													
211	E27	lower							0.0						
		upper							0.3						
		comment													
212	E28	lower		0.20						0.1			0.1		
		upper		0.20						0.1			0.1		
		comment													
213	E29	lower		0.05		32.6									
		upper		0.05		32.6									
		comment													
219	E30	lower	2.79	0.01	3.6	0.1	41.1					1.78		1.78	
		upper	2.79	0.01	3.6	0.1	41.1					1.78		1.78	
		comment													
215	NI2	lower	0.00	0.00	0.7	0.0	0.7	0.0	0.0	3.5	0.8	0.03	5.1	0.10	1
		upper	0.19	0.01	1.2	0.8	0.7	0.0	0.0	3.5	0.8	0.03	5.1	0.10	1
		comment													
214	SC1	lower	0.00	0.00	0.0	0.0	0.2			0.0	0.0	0.03	0.1	0.06	2
		upper	0.00	0.00	0.0	0.0	0.2			0.0	0.0	0.03	0.1	0.06	2
		comment													
88	Irish Sea (UK)	lower	2.79	0.26	4.3	32.7	41.9	0.0	0.0	3.6	0.8	1.84	5.3	1.94	2
		upper	2.98	0.27	4.9	33.5	41.9	0.0	0.3	3.6	0.8	1.84	5.3	1.94	2
		comment													

Total UK: Direct, Industrial	lower	4.03	0.38	42.4	51.5	329.3	5.2	0.2	10.0	5.4	2.43	17.8	2.64	320
	upper	4.96	0.44	49.9	55.5	329.6	6.4	0.9	10.0	5.4	2.44	17.8	2.64	320

Total UK: Direct	lower	5.78	0.49	156.0	93.0	634.5	175.7	3.2	52.0	16.7	15.49	79.0	17.85	570
Sewage + Industrial	upper	7.00	0.62	163.5	97.9	634.8	196.8	177.4	52.1	16.9	15.50	79.3	17.86	570

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Table 6a. Main Riverine Inputs
Reported Maritime Area of the OSPAR Convention in 1997 by United Kingdom

			1.00	5.00	6.0	2.0	7.0	8.0	9.0	10.0	11.0	12.00	13.0	14.00	3
			Cd [t]	Hg [t]	Cu [t]	Pb [t]	Zn [t]	g-HCH [kg]	PCB [kg]	NH4-N [kt]	NO3-N [kt]	PO4-P [kt]	Total N [kt]	Total P [kt]	SPM [kt]
218	NI1	lower	0.00	0.03	19.0	2.0	21.4	9.1	0.0	0.4	8.3	0.35	8.8	0.76	76
		upper	0.60	0.60	19.0	3.2	26.8	12.3	6.0	0.5	8.3	0.43	8.9	0.77	77
		comment													
216	SC2	lower	0.30	0.13	28.2	29.7	104.6	12.0	2.3	3.0	7.9	0.05	7.2	1.20	175
		upper	0.40	0.13	28.2	29.7	104.6	16.0	69.2	3.2	7.9	0.90	7.2	1.20	177
		comment		1996 loads						1996 loads					
217	SC2a	lower	0.41	0.50	7.1	1.0	27.9	0.0	0.0		0.3	0.00	0.8	0.27	2
		upper	1.59	0.51	7.2	2.1	28.0	5.1	0.0		0.3	0.02	0.8	0.27	13
		comment													
92	Atlantic (UK)	lower	0.71	0.66	54.3	32.7	153.9	21.1	2.3	3.4	16.4	0.40	16.7	2.23	253
		upper	2.59	1.24	54.4	35.0	159.4	33.3	75.2	3.7	16.4	1.35	16.9	2.24	267
		comment													
203	E19	lower	0.06	0.00	3.6	0.2	36.2	0.1		0.0	0.8	0.01	0.8	0.01	3
		upper	0.06	0.00	3.6	0.2	36.2	0.2		0.0	0.8	0.01	0.8	0.01	3
		comment													
204	E20	lower	0.06	0.00	2.8	0.8	8.3	0.7		0.0	3.4	0.05	3.5	0.05	29
		upper	0.06	0.01	2.8	0.8	8.8	2.7		0.0	3.4	0.05	3.5	0.05	29
		comment													
205	E21	lower	0.04	0.00	1.1	0.3	6.9	1.2		0.1	2.8	0.17	3.0	0.17	6
		upper	0.04	0.00	1.1	0.3	6.9	1.4		0.1	2.8	0.17	3.0	0.17	6
		comment													
206	E22	lower	0.21	0.02	10.9	11.4	95.4	10.7	32.4	0.4	15.0	1.82	15.5	1.82	78
		upper	0.33	0.05	10.9	11.4	95.4	14.9	60.5	0.4	15.0	1.82	15.5	1.82	78
		comment													
207	E23	lower	0.26	0.00	14.4	16.3	66.5	4.5		0.2	8.6	0.21	8.9	0.21	334
		upper	0.43	0.03	14.8	18.9	66.5	9.9		0.2	8.6	0.21	8.9	0.21	334
		comment													
208	E24	lower	0.30	0.00	8.1	5.5	60.5			1.0	0.3	0.18	1.3	0.18	71
		upper	0.32	0.00	8.1	5.6	60.5			1.0	0.3	0.18	1.3	0.18	72
		comment													
209	E25	lower	0.00	0.04	1.1	0.6	21.2			0.1	3.7		4.1		45
		upper	0.02	0.04	1.2	3.0	21.2			0.1	3.7		4.1		45
		comment													

			Cd [t]	Hg [t]	Cu [t]	Pb [t]	Zn [t]	g-HCH [kg]	PCB [kg]	NH4-N [kt]	NO3-N [kt]	PO4-P [kt]	Total N [kt]	Total P [kt]	SPM [kt]
90	Celtic Sea (UK)	lower	0.93	0.07	42.0	35.1	294.8	17.1	32.4	1.8	34.5	2.44	37.1	2.44	565
		upper	1.24	0.13	42.5	40.1	295.3	29.1	60.5	1.8	34.5	2.44	37.1	2.44	566
		comment													
197	E13	lower				1.3	9.0	1.7		0.3	1.5	0.18	1.9	0.18	
		upper				1.3	9.0	1.7		0.3	1.5	0.18	1.9	0.18	
		comment													
198	E14	lower	0.01	0.00	0.5	1.3	2.7	0.0		0.0	1.9	0.19	1.9	0.19	0
		upper	0.01	0.00	0.5	1.3	2.7	0.0		0.0	1.9	0.19	1.9	0.19	0
		comment													
199	E15	lower			0.7		2.3				1.5	0.08	1.5	0.08	
		upper			0.7		2.3				1.5	0.08	1.5	0.08	
		comment													
200	E16	lower	0.14	0.04	6.3	2.0	30.6	5.0		0.2	10.4	0.43	10.7	0.43	40
		upper	0.14	0.04	6.3	2.0	31.2	6.6		0.2	10.4	0.43	10.7	0.43	40
		comment													
201	E17	lower	0.11	0.00	3.2	1.4	16.1	0.6		0.1	3.6	0.12	3.7	0.12	23
		upper	0.11	0.01	3.2	1.5	16.6	3.5		0.1	3.6	0.12	3.7	0.12	23
		comment													
202	E18	lower	0.32	0.01	26.8	1.3	107.2	2.3		0.1	4.7	0.06	4.8	0.06	26
		upper	0.32	0.01	26.8	1.4	107.3	4.0		0.1	4.7	0.06	4.8	0.06	27
		comment													
86	Channel (UK)	lower	0.59	0.04	37.5	7.3	167.8	9.7	0.0	0.7	23.7	1.06	24.5	1.06	89
		upper	0.59	0.06	37.5	7.5	169.1	15.9	0.0	0.7	23.7	1.06	24.6	1.06	90
		comment													
185	E1	lower	0.00	0.00	6.8	1.9	12.0	1.1		0.1	8.5	0.17	8.7	0.17	77
		upper	0.23	0.05	6.8	3.1	21.7	3.9		0.1	8.5	0.18	8.7	0.18	78
		comment													
194	E10	lower	0.01	0.00	1.4	0.4	2.2	0.7		0.0	2.3	0.16	2.4	0.16	3
		upper	0.01	0.01	1.4	0.4	2.2	2.2		0.0	2.3	0.16	2.4	0.16	4
		comment													
195	E11	lower	0.00	0.00	0.2	0.0	0.3	0.3		0.0	0.2	0.04	0.2	0.04	0
		upper	0.00	0.00	0.2	0.0	0.3	0.3		0.0	0.2	0.04	0.2	0.04	0
		comment													
196	E12	lower	0.06	0.00	6.6	4.2	17.8	11.1	0.0	0.2	6.9	1.55	7.3	1.55	11
		upper	0.10	0.01	6.6	4.2	17.8	11.4	27.4	0.3	6.9	1.55	7.3	1.55	11
		comment													
186	E2	lower	0.25	0.00	2.9	15.3	97.6	0.8		0.1	1.0	0.10	1.1	0.10	20
		upper	0.28	0.02	2.9	15.3	97.6	2.2		0.1	1.0	0.11	1.1	0.11	20
		comment													

			Cd [t]	Hg [t]	Cu [t]	Pb [t]	Zn [t]	g-HCH [kg]	PCB [kg]	NH4-N [kt]	NO3-N [kt]	PO4-P [kt]	Total N [kt]	Total P [kt]	SPM [kt]
187	E3	lower	0.02	0.00	1.6	3.2	14.8	0.9		0.2	1.4	0.20	1.6	0.20	9
		upper	0.04	0.01	1.6	3.2	14.8	1.2		0.2	1.4	0.20	1.6	0.20	9
		comment													
188	E4	lower													
		upper													
		comment													
189	E5	lower	0.03	0.00	1.0	6.2	7.2	0.5		0.0	1.0	0.10	1.0	0.10	3
		upper	0.06	0.01	1.0	6.2	7.2	0.6		0.0	1.0	0.10	1.0	0.10	3
		comment													
190	E6	lower													
		upper													
		comment													
191	E7	lower													
		upper													
		comment													
192	E7a	lower	1.31	0.13	51.0	104.1	246.1	34.9	52.5	2.0	32.9	4.96	35.3	4.96	152
		upper	1.43	0.18	51.0	104.2	246.9	38.7	90.8	2.0	32.9	4.96	35.3	4.96	152
		comment													
193	E9	lower	0.03	0.01	3.2	0.5	5.9	5.5	0.0	0.1	3.8	0.53	3.9	0.53	4
		upper	0.03	0.01	3.2	0.5	5.9	5.3	0.0	0.1	3.8	0.53	3.9	0.53	4
		comment													
181	SC2b	lower	0.54	1.13	20.9	4.7	72.2	0.0			1.4	0.04	2.5	0.11	18
		upper	2.94	1.15	21.0	6.6	72.5	3.7			1.4	0.07	2.6	0.11	34
		comment													
182	SC3	lower	0.06	0.27	8.1	1.2	26.5	2.5		0.3	7.8	0.12	9.7	0.22	70
		upper	0.32	0.63	8.3	2.5	27.0	11.9		0.3	8.0	0.12	9.9	0.22	71
		comment													
183	SC4	lower	0.23	0.00	30.4	13.9	61.7	0.8		0.3	9.0	0.29	14.6	0.45	99
		upper	0.78	0.33	30.4	14.6	61.8	7.3		0.3	9.1	0.30	14.6	0.45	102
		comment													
184	SC5	lower	0.06	0.02	5.8	3.2	33.2	1.8		0.4	5.1	0.31	6.9	0.41	21
		upper	0.26	0.02	5.8	3.4	33.2	3.7		0.4	5.1	0.31	6.9	0.41	21
		comment													
84	North Sea (UK)	lower	2.62	1.58	139.9	158.8	597.5	60.7	52.5	3.7	81.4	8.57	95.2	9.00	488
		upper	6.48	2.42	140.2	164.3	608.8	92.2	118.2	3.8	81.6	8.62	95.5	9.01	509
		comment													

			Cd [t]	Hg [t]	Cu [t]	Pb [t]	Zn [t]	g-HCH [kg]	PCB [kg]	NH4-N [kt]	NO3-N [kt]	PO4-P [kt]	Total N [kt]	Total P [kt]	SPM [kt]
210	E26	lower	0.23	0.00	4.9	3.8	91.1			0.0	2.2	0.01	2.2	0.01	60
		upper	0.25	0.01	5.1	3.8	91.1			0.0	2.2	0.01	2.2	0.01	60
		comment													
211	E27	lower	0.12	0.00	9.1	2.4	60.8	0.0	0.0	0.1	2.3	0.14	2.8	0.14	19
		upper	0.18	0.01	9.4	4.1	60.8	0.0	0.0	0.1	2.3	0.14	2.8	0.14	20
		comment													
212	E28	lower	0.21	0.11	11.5	8.2	41.3	1.9	5.4	4.7	7.9	1.36	13.0	1.36	22
		upper	0.23	0.14	11.5	8.2	41.3	11.6	53.6	4.7	7.9	1.36	13.0	1.36	22
		comment													
213	E29	lower	0.26	0.03	12.9	8.4	34.5	1.6	5.8	0.5	8.4	0.74	9.0	0.74	61
		upper	0.30	0.06	12.9	8.4	35.1	16.5	111.7	0.5	8.4	0.74	9.0	0.74	63
		comment													
219	E30	lower	0.09	0.01	3.5	5.5	21.7	0.0	1.6	0.1	3.9	0.10	4.1	0.10	23
		upper	0.09	0.04	3.5	5.5	21.7	10.0	107.1	0.1	3.9	0.11	4.1	0.11	24
		comment													
215	NI2	lower	0.00	0.01	7.4	3.8	29.9	3.9	0.0	0.2	3.4	0.22	3.6	0.44	46
		upper	0.10	0.10	7.4	3.9	30.0	3.9	1.0	0.2	3.4	0.22	3.6	0.44	46
		comment													
214	SC1	lower	0.20	0.03	8.5	9.0	29.6	0.1		0.3	5.7	0.10	9.1	0.33	105
		upper	0.60	0.60	9.5	10.2	30.4	9.5		0.3	5.7	0.10	9.1	0.33	106
		comment		1995 loads											
88	Irish Sea (UK)	lower	1.11	0.19	57.9	41.0	308.9	7.4	12.8	5.9	33.8	2.68	43.8	3.13	336
		upper	1.75	0.96	59.4	44.0	310.3	51.6	273.3	6.0	33.8	2.69	43.9	3.14	340
		comment													

Total UK: Riverine	lower	5.96	2.53	331.5	274.9	1523	116.0	100.0	15.6	189.8	15.2	217.3	17.9	1732
	upper	12.64	4.80	333.9	290.9	1543	222.0	527.2	15.9	190.0	16.2	217.9	17.9	1772

Total UK: Direct + Riverine	lower	11.7	3.0	488	368	2157	292	103	68	206	30.6	296	35.7	2302
	upper	19.6	5.4	497	389	2178	419	705	68	207	31.7	297	35.8	2342

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Table 9. Catchment-dependent information
Reported Maritime Area of the OSPAR Convention in 1997 by United Kingdom

Note: the flow rate data relate only to riverine inputs, not to direct discharges.

		Flow Rate [1000m³/d]	LTA [1000m³/d]	Minimum FR [1000m³/d]	Maximum FR [1000m³/d]	LTA info (years)	Number of sites	Mean or Median
218	NI1	15566	16710				7	
216	SC2	14420	14640				13	
217	SC2a	18317	18317				11	
92	Atlantic (UK)	48303	49667				31	
203	E19	534	650				3	
204	E20	2273	2890				3	
205	E21	851	865				3	
206	E22	6748	11450				2	
207	E23	9370	12370				7	
208	E24	2869	2610				6	
209	E25	5096	5630				7	
90	Celtic Sea (UK)	27742	36465				31	
197	E13	610	1410				3	
198	E14	914	970				4	
199	E15	718	1510				2	
200	E16	2538	3020				4	
201	E17	2786	4450				4	
202	E18	3280	5098				9	
86	Channel (UK)	10845	16458				26	
185	E1	8549	8052				3	
194	E10	976	1210				6	
195	E11	95	350				3	
196	E12	2013	7750				10	
186	E2	3731	3833				3	
187	E3	1126	908				1	
188	E4						0	
189	E5	954	1490				1	
190	E6						0	
191	E7						0	
192	E7a	15164	20040				8	
193	E9	1192	2870				7	
181	SC2b	31547	31547				24	
182	SC3	14171	14050				8	
183	SC4	19954	20502				7	
184	SC5	7772	8714				14	
84	North Sea (UK)	107244	121316				95	
210	E26	5564	6190				7	
211	E27	3952	5500				6	
212	E28	4062	4840				4	
213	E29	7387	9920				7	
219	E30	5552	6580				2	
215	NI2	2479	1490				3	
214	SC1	13880	13880				11	
88	Irish Sea (UK)	42875	48400				40	

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